Wildflower Portraits:

Plants along the Missouri National Recreational River in Nebraska

Patricia James

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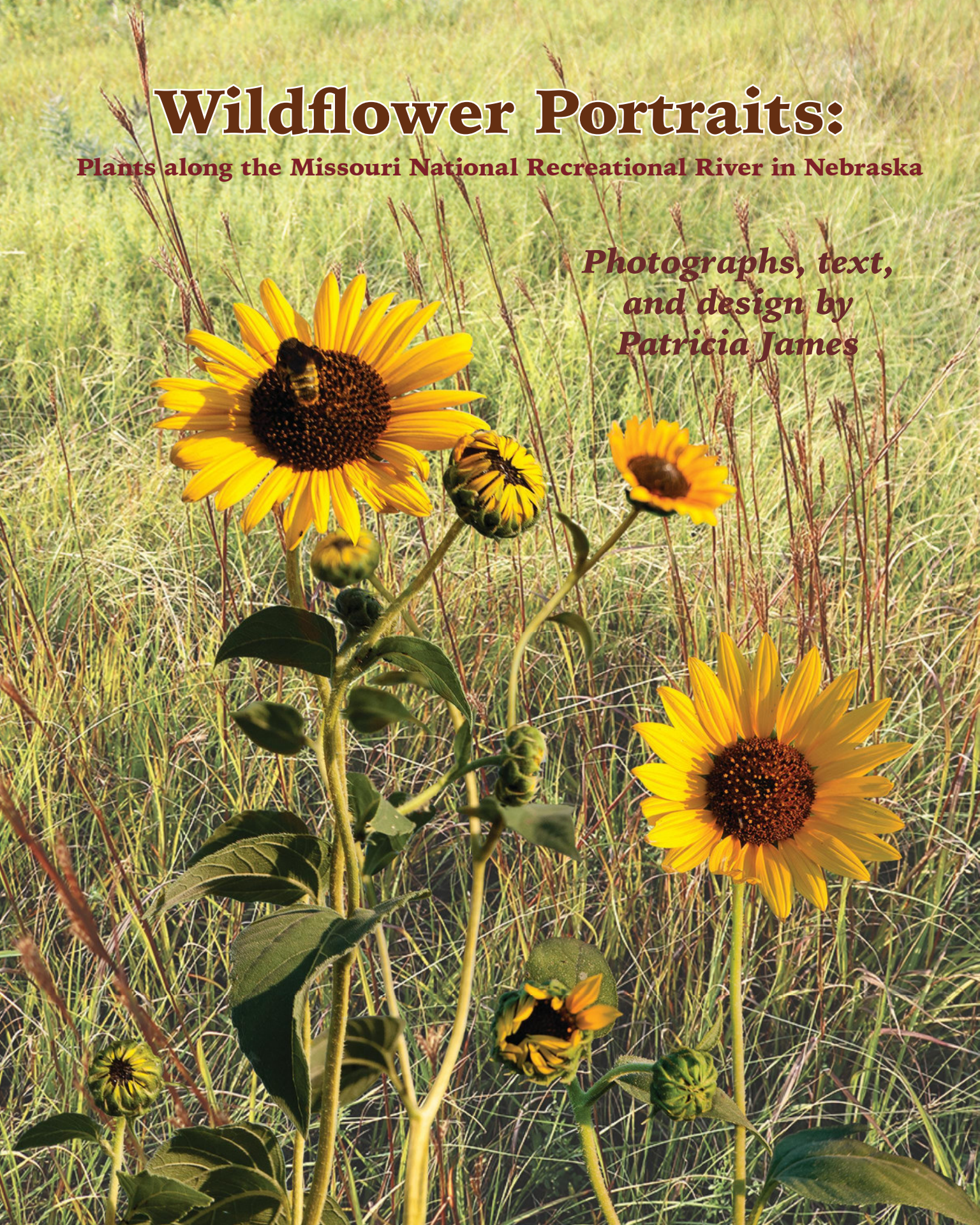
Photographs, text, and design by Patricia James

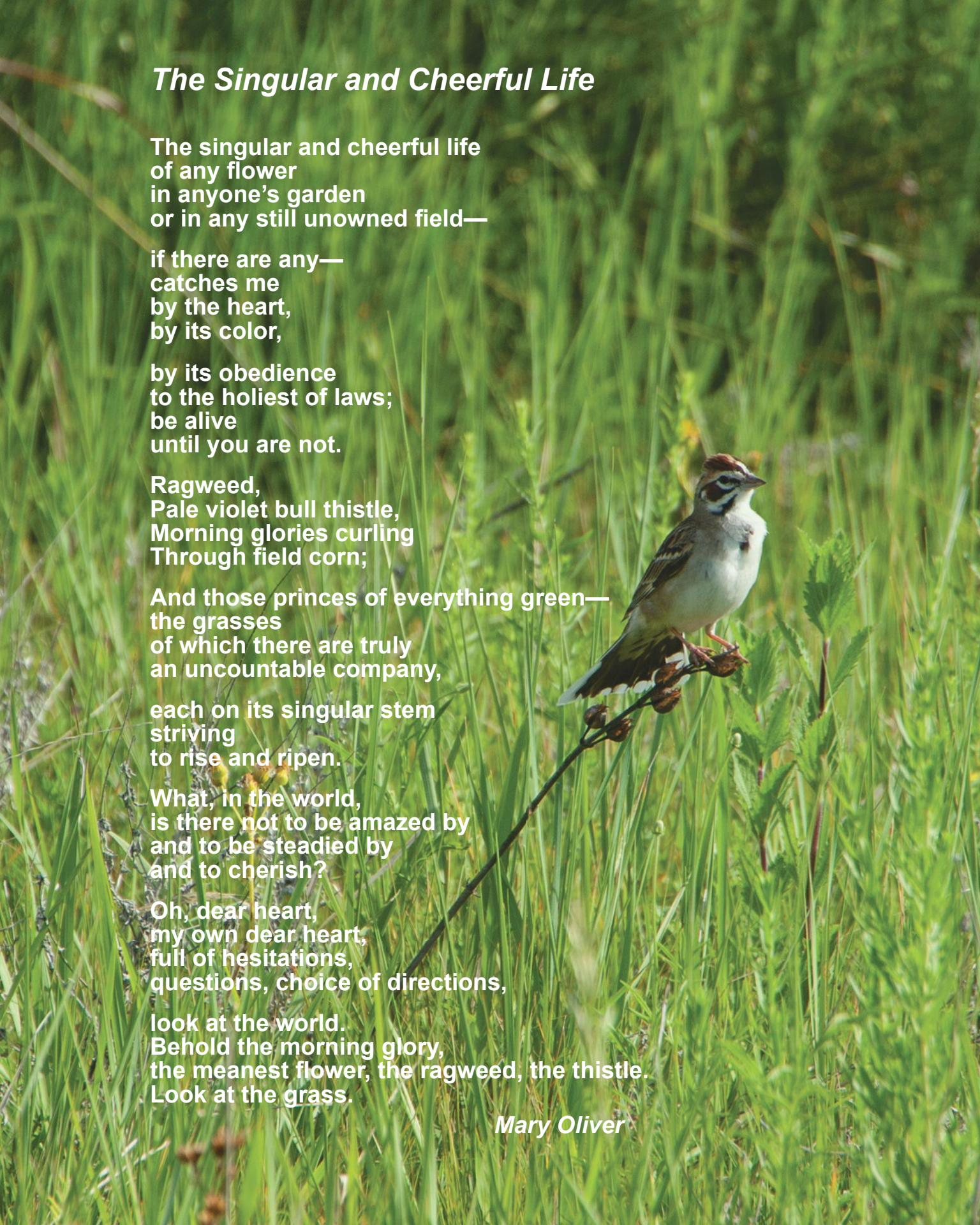


Lynch, Nebraska
July, 2023

On the cover: A view of the 39-mile stretch of the Missouri National Recreational River. The photograph was taken from a hill in the south-central pasture of the James Place in Boyd County, Nebraska, on October 11, 2022.

Opposite page: A lark sparrow perched among grasses, hoary vervain, and heath aster. Southeast side, June 3, 2017.

Oliver, M. (2009). The singular and cheerful life (pp. 71-72). *Evidence*. Beacon Press.



The Singular and Cheerful Life

**The singular and cheerful life
of any flower
in anyone's garden
or in any still unowned field—**

**if there are any—
catches me
by the heart,
by its color,**

**by its obedience
to the holiest of laws;
be alive
until you are not.**

**Ragweed,
Pale violet bull thistle,
Morning glories curling
Through field corn;**

**And those princes of everything green—
the grasses
of which there are truly
an uncountable company,**

**each on its singular stem
striving
to rise and ripen.**

**What, in the world,
is there not to be amazed by
and to be steadied by
and to cherish?**

**Oh, dear heart,
my own dear heart,
full of hesitations,
questions, choice of directions,**

**look at the world.
Behold the morning glory,
the meanest flower, the ragweed, the thistle.
Look at the grass.**

Mary Oliver

In loving memory of Hugh and Helen James.
And with much love to Tom, Gary, Karen, and Caitlin.

Contents

Opposite page: Canada geese flying above the Missouri River. From the river bank, March 12, 2018.

Each plant tells its own story.

Adapting to a tough environment, they are battered by wind and rain, blasted by the sun, trampled by cows, and chewed on by insects.

Birds thrive on their seeds, bees flourish on their nectar, and animals hide among them.

Some plants prefer the shade of the woods, others flourish in the full sun in the hills or along the gravel road.

I am fascinated by their stages of growth, bloom, and decay over the seasons.

Each plant is in a constant state of transformation, as is the land they grow on. As am I.

Part One: The Lay of the Land

Wildflower Portraits features artistic portraits of 201 different plants I photographed on my family's ranch—which I'll call the James Place—in Boyd County, Nebraska. I think of the images as "portraits" because they celebrate the individuality of each plant. Although I've included brief facts and historical or cultural context about each plant, this book is not intended to be a field guide. Instead, it is a personal exploration of my experiences with the plants and the land they grow on.

I think of this book as a kind of prayer that expresses my sense of awe in the presence of something that is beyond myself. To me, "prayer" is the universal human impulse to honor and connect with a larger life force. Perhaps it is an act of humility—indeed, I am often on my knees when I take photos or cut little cedars or crawl up and down the sides of steep draws. I look up at the vast wonderfulness of the Nebraska sky, but I also look down toward the earthiness of the soil and the cow pies and bones scattered in the pastures.

This book is a plea for the preservation of our natural environment, especially in the face of climate change. It is praise for the good that plants do for wildlife, the earth, and humans. It is an expression of gratitude for what other people have taught me about the land and the local culture. I have deep respect for my friends who have farmed and lived here for many generations—they have taught me so much about community and hard work. I am only a transplant to this land.

In the portraits, I hope to celebrate each plant's fragile beauty as well as its strength. Each flower—even a so-called weed—encourages a sense of awe and wonder at the complexity and diversity of the natural world. This book is my salute to the land itself and to everything that lives on it. Each day offers shifting shapes, colors, and textures, and I am surrounded by a constant dance of change. Living here is an ongoing process of discovery. I love this place.

Deer outside my window on the James Place. Northside, February 2, 2009.

My father and brother, Gary, stand on a bluff about 70' above the Missouri River. This photograph was taken in the early 1960s. A few years later, my father had a prefabricated hunting cabin put up on that spot. The vegetation behind my father and brother are the tops of trees growing on the next level of the bluff.

An addition to the northwest side of the old hunting cabin in 2006 expanded my living space, and new windows and a deck provided an expansive view up and down the Missouri River. I took this photo as I was walking up the bluff toward the cabin, on September 25, 2022.

Going to the Cabin

Although I am not native to Nebraska, I have deep roots in this state. In 1904, my grandparents established a homestead in the Nebraska Sandhills, where my father, Hugh T. James, was born in 1914. Although he had only an 8th grade education, he wanted to become a commercial artist, so he left the family ranch in Holt County when he was 19 and moved down to Omaha, where he went to art school for six months to learn design basics. The rest of his art education took place in various graphic design jobs. After World War II, he became an advertising art director in Chicago. My parents raised me and my brothers, Tom and Gary, in the Chicago suburb of Glenview, but we made many summer trips back to Holt County, Nebraska to visit Dad's family. In the late 1950s, my father's brother, Lloyd, bought a ranch further north in Boyd County, Nebraska. Dad purchased 600 acres of nearby ranchland in 1959 so he could visit Lloyd and hunt ducks on the Missouri River with him. A small hunting cabin was built above the river in 1964.

As a young adult in the late 1960s, I started taking short vacations to the ranch with my father, and this tradition of "going to the cabin" with him continued for over 30 years. After working various art-related jobs and earning two degrees in studio art and a Ph.D in curriculum and instruction, I eventually became an associate professor of art in General College at the University of Minnesota in Minneapolis in 1993. In addition to teaching culturally diverse, first and second-year students, I did qualitative research about teaching and learning artistic thinking.

A gravel county road intersects the north (left of the lower part of the road) and south sides of the James Place and descends through Sunshine Bottom. Our western property line is a little further down the road. Our cabin is the small structure at the far left, on the bluff above the river. I took this photo in the late 1970s or early '80s.

During my time in the Twin Cities, I often thought about living in our cabin on the ranch. When my brothers and I inherited the James Place from our father in 2003, I was still teaching at the University of Minnesota. I soon decided to start phased retirement, and spent the next six summers staying in the cabin. Tom lived in Chicago, and Gary and his family were in North Carolina—I was the only one of us who was interested in actually living on the property. No one in our family had ever lived full-time on the James Place until I moved to Boyd County in 2009 and made the cabin and the land my home. I soon found out— usually the hard way—that I did not know very much about living in the country and taking care of land!

This place is deeply personal to me. I've walked almost every acre of it, in all seasons and over many years. It is both familiar and always surprising. I have gradually learned about the land through my feet and body, as well as through my eyes. By walking, working, and making art about it, I have developed awe, respect, and concern for this place that I call home—and for the larger ecosystems of which it is just a tiny piece.

Hills Column 16

Hills Column 23

Learning to See A Place

Both of my parents were artists and I studied art in college, so I when I first came to the ranch with my father as a young adult in 1967, I was especially attracted to the beauty of the landscape. I loved gazing at the distant horizons, the open sky, and the nearly 12-mile-long ribbon of Missouri River that was visible from our cabin on the bluff. For many years, looking at this panorama was like looking at a landscape painting, but I didn't understand much of what I was actually seeing—hills were simply hills, the deep, dark, wooded draws were rather scary, and without a boat, the river seemed very remote. Everything in this hilly environment was different from the flatness of the Chicago suburb where I grew up, and it was a world away from the densely populated, concrete worlds of Chicago and Minneapolis/St. Paul, where I lived and worked for many years. As for plants—well, I knew they were green and they grew! My "plant blindness" meant that I could barely distinguish common weeds, let alone plants that were native to this area.

My experiences in the arts have taught me that it takes time to learn to *see*. The land here is not beautiful in a traditional sense; instead, it is terrain that demands close attention and time to appreciate. After I moved here in 2009, I decided that taking photos of the James Place would be a way for me to continue to make art. Much of my training, however, was in sculpture, not photography, so I had to figure out how to make photography work for me. I developed a non-traditional way of using making digitally layered compositions that I call "photoconstructions." My photos of the land and river are like found objects that I put together in new combinations. Although I admire photographers who prepare their shots, I prefer to take multiple, unplanned photos while I am walking on the property. Then I use Photoshop CC to digitally cut and refine selected photographs that I layer together to make unified compositions. The resulting photocontructions are both realistic and somewhat surrealistic.

After moving full-time to the cabin, I used my photographs of the James Place to make three series of photoconstructions in long column shapes, which I exhibited in a number of venues. The two photoconstructions on the left are from my first series, *Hills Columns*. I also made a *Walking Poem* series and a *River Poem* series, featuring the Missouri River. Most of these columns has about 12 different layers of photos. Over time, I started to pay more attention to the diverse plants that grow here, and my artistic focus became the *Wildflower Portrait* series. My goal was to find and photograph every species of plant (forbs, shrubs, and vines) on the James Place, and to create digital portraits of them. I didn't find *every* plant, but I found a lot of them! I took photographs of plants where I found them growing, and then made the portraits by placing the digitally-refined plant photos on layers of sky photos I took at a different time.

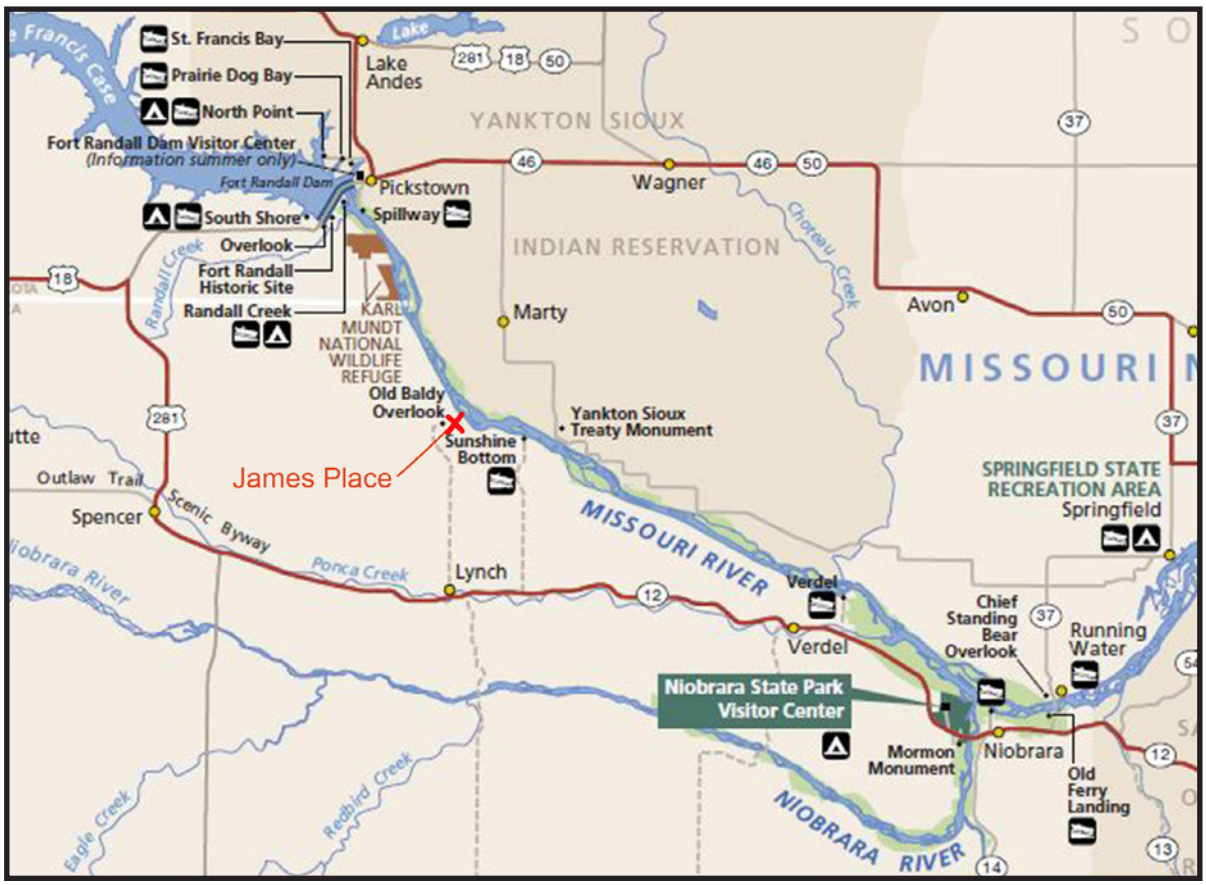
My original intent was to print, frame, and exhibit about 100 of the plant portraits, which I did in several gallery spaces in Nebraska, South Dakota, and Iowa. But now my wildflower project has expanded into this book of 201 different plants I found on the James Place. Eventually, my curiosity about the plants led to researching them, and as part of the portraits, I've included brief botanical, cultural, and historical information about each species, as well as some of my personal experiences with them. Before presenting the wildflower portraits, however, I want to sketch some of the larger human and natural contexts of the place where the plants grew.

Opposite page: Two columns (out of 25) from my Hills Columns, my first series of photoconstructions. Each photoconstruction is 14" x 38" when framed. Pigmented inkjet on archival paper.

Continuity, Change, and Interconnectedness

The James Place—and the plants that grow on it—don't exist in isolation. Part of the 39-mile stretch of the Missouri National Recreational River (MNRR), this ecoregion is a complex web of interactions: soil, plants, wildlife, wind, sun, fungi, weather, and water are among the many factors that have shaped the area in diverse ways, continually leaving visible and invisible marks and changes. Over time, it also has been shaped by diverse people, including indigenous tribes as well as European-American fur traders, explorers, and settlers. People continue to affect this ecoregion with modern roads, cars, boats, agricultural practices, buildings, government policies, dams, and wind turbines (south of the Niobrara River). It is always in flux.

The 98 miles of the MNRR remain relatively natural and unchannelized. The map below shows the 39-mile stretch of the MNRR as it is now, from Fort Randall Dam to the Springfield State Recreation Area, both in South Dakota. The 59-mile stretch of the MNRR (not on the map) runs from Gavins Point Dam in Yankton, SD, to Ponca State Park in eastern Nebraska. Boyd County, NE, is west of Verdel and north of the Niobrara River; Knox County, NE is east of Boyd County; and Charles Mix County, SD, is north of the Missouri River and east of Lake Andes.



This map of the 39-mile stretch of the Missouri National Recreational River is part of a larger map published by the National Park Service. I've marked the James Place with a small red X between Old Baldy and Sunshine Bottom on the Nebraska side. The nearest bridges over the Missouri River are at the Fort Randall Dam on HWY 28, or the Chief Standing Bear Bridge near Niobrara. Construction of Fort Randall Dam was completed in 1954. The dam generates hydro-electic power and regulates river levels in this stretch of the MNRR. Four other dams upriver and one below also regulate the Missouri River system from Montana to Sioux City, Iowa.

Despite modern developments, this area looks much like it might have appeared over two hundred years ago, when the Lewis and Clark Expedition camped nearby in 1804. Compared to the higher-density areas of south-central and southeast Nebraska, where I-80, urban development, and large-scale agriculture and industry have fragmented the land, Boyd County has a low population (1,752 in 2022) and has been relatively untouched by extensive development. Although there are a few farms on the flat land on the east side of Sunshine Bottom on the Nebraska side, the steep hills along the river have largely remained unplowed. Most of the land across the Missouri River on the South Dakota side is undeveloped Yankton Sioux tribal land.

The upper part of the 39-mile stretch of the Missouri National Recreational River, photographed from our southeast hills. Fort Randall Dam is about 9 miles upriver. Yankton Sioux tribal land extends along the South Dakota side of the river. The green shape in the river is the vegetated sand bar, and the bare sandbar to the left is usually restricted to protect the least terns and piping plovers that nest on it. Our cabin is a small white shape on the far left. July 14, 2020.

American Indians along the MNRR

Indigenous people have used this region's land, rivers, and creeks to hunt, fish, live, farm, travel, and socialize over many centuries. In the Lynch area, some of this history is slowly being revealed: archaeological digs, conducted off and on since the 1930s, have discovered that a large indigenous farming community was established in the 13th–14th centuries along the Ponca Creek, about 8 miles south in Lynch. They lived and farmed corn and squash along rich, spring-fed flood plains, but is not known exactly why they left the area and moved north. Starting in the 18th century, three American Indian tribes established communities along the MNRR: Yankton Sioux, Ponca, and Santee Sioux. I'm just beginning to understand the rich and troubled history of these tribes in this area, so I can only provide a brief sketch.

Every time I look over the Missouri River toward Charles Mix County in South Dakota, I see the Yankton Sioux (Ihanktonowan Dakota Oyate) tribal land. Originally from Minnesota, they settled in southeast South Dakota in the early 1700s. The Lewis and Clark Expedition held council with tribal members on August 31, 1804, in the Yankton area. But after the Yankton Sioux Tribe ceded their land to the U.S. Government in the 1850s, they had to move further west to their current reservation in Charles Mix County. The Yankton Agency was established in 1859 in Greenwood, SD, (near the Yankton Sioux Treaty Monument on the map). Although Greenwood is mostly empty now, the annual Greenwood Wacipi Powwow is held there in early July. I enjoy hearing the beat of their drums and singing as it drifts across the river.

In the late 1700s, the Ponca Tribe established a farming village near the confluence of the Niobrara and Missouri Rivers, in what is now Knox County, NE. Members of the Lewis and Clark Expedition visited the village on September 5, 1804. Years later, after a number of broken treaties with the US government, the tribe was forced to walk to Indian Territory (now Oklahoma) in 1877, and many of them died. When Ponca Chief Standing Bear was forbidden from burying his son in their Nebraska homeland, he sued the US government. He won the lawsuit in 1879, after which all American Indians were considered "persons within the meaning of the law." Some Ponca members returned to their Nebraska homeland after it was reinstated by the federal government in 1881, but in 1962 the US government terminated their tribal status. The tribe regained federal recognition in 1990, and the Ponca Tribe of Nebraska is again located in Knox County, where they have been working to restore their culture and land.

The Santee Sioux Tribe is currently located 14 miles east of Niobrara along the Missouri River, also in Knox County. Originally a woodland tribe from northern Minnesota, tribal warfare forced the Santee to relocate to southern Minnesota. With increased White settlement in the area, however, the federal government moved the Santee Tribe to reservation land in southwest Minnesota in 1837, but broken treaties deprived the tribe of the promised means to support themselves there. The Santee Sioux Uprising of 1862 resulted in the hanging execution of 37 Santee men. The tribe was again forced to relocate in 1866, this time to their current reservation in Knox County.

The Lewis and Clark Expedition, 1804-06

Looking out my southwest window, I can see the top of what is now called Old Baldy. The Lewis and Clark Expedition camped on nearby on September 7, 1804, and they called this sedimentery cone "The Cupola." I enjoy reading that day's journal entries about land and river that are so familiar to me. Sergeant Gass described what he observed from the boat as they passed near what is probably our river woods: "We set sail early, and had a clear day: passed high prairie land on both sides; but there is some cotton wood on the low points in the bottoms." Because the landscape looks essentially as it did when the Expedition camped near here, Old Baldy and the bottomland on the James Place were placed in the National Register of Historic Places in 2004.

Old Baldy is the contemporary name for the bare mound at the top left. Sergeant John Ordway, from the Lewis and Clark Expedition, described this hill as a "...naked high round knob." This historical site is on a neighbor's property about 1.5 miles west of our place; I can see it from my window. I took this photograph from the side of the gravel country road on September 7, 2022.

After setting up camp near Old Baldy, the men used buckets of water to flush out their first live prairie dog from a burrow. William Clark wrote: "Cap. Lewis & myself walked up to the top which forms a Cone and is about 70 feet higher that the high lands around it, the Base is about 300 foot in decending this Cupola, discovered a Village of Small animals that burrow in the grown (those animals are called by the french Petite Chien)." [Original punctuation].

On the day that Lewis and Clark camped near Old Baldy, their primary focus seemed to be to catch a prairie dog, and there is no mention of plants in their journal entries. But numerous entries in the journal recorded many species of plants that Meriweather Lewis identified or collected around 200 miles up and down river from here. I found a number of them growing on the James Place and made portraits of them.

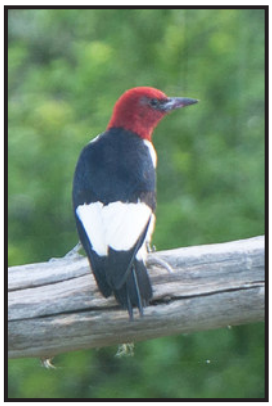
Sunshine Bottom

By the 1830s, steamboats traveled up and down the Missouri River hauling livestock, food, commercial goods, and grain. Many of the boats stopped at the Iron Post Landing near Old Baldy, where they loaded horse-drawn wagons that carried the cargo further south and west. European–Americans moved into Sunshine Bottom in the early 1890s, when Boyd County was first opened to settlers. Some farmed the flat bottom land, where an active community was established, including a school and post office. A smaller community, Tower, developed around the Iron Post Landing near Old Baldy and featured a brickyard. Prairie fires and river flooding were an ongoing threat to these settlers. Ferries near Greenwood and at the Iron Post took people from one side of the river to the other, often to sell goods.

I've found remnants of two original farmsteads on the James Place. Lana and Louis Potter were among the early settlers in Sunshine Bottom in the late 1890s, and parts of the Potter house still stand in the far southeast side of the James Place. I'm not sure when they built their house, but I found horsehair and an "Ivory Soap" cardboard box among the materials used for insulation. I also found scraps of newspapers from 1918 and the mid-'30s that had fallen through the collapsed ceiling. Compared to my grandparents' homestead in the Sandhills, the Potters had a relatively fancy house decorated with at least seven different patterns of floral wallpaper. A number of years ago I was fortunate to meet Harry Potter, Lana and Louis's grandson, who lived with his parents in the Potter House in the late 1920s and early '30s. He told me about finding rattlesnakes and the difficulties his parents had farming during that time. His family moved to the community near the Iron Post, and Harry used to hunt along the river for rabbit, which he sold in Greenwood. The other farmstead on the James Place was owned by Jim Sucksdorf, an immigrant from Germany, who had a house and small corral along the road on the north side until the late 1950s.

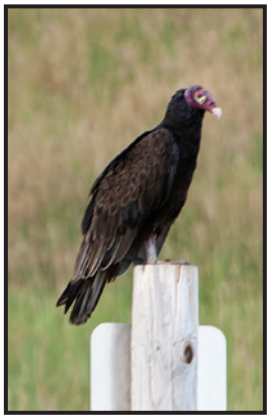
The Potter house was originally painted green, and shingle siding was added at a later time. Lana and Louis Potter's son Ivan lived in the house in the 1930s and '40s, which may have been when electricity was added. The word "Heritage" was spray painted on the left side in the early 2000s, but I never found out who did it. The house has further disintegrated since this photograph was taken on June 4, 2014.

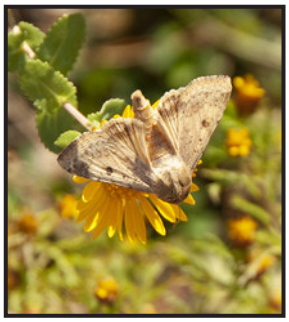
Since the mid–1960s, Sunshine Bottom has been known for several recreational communities, including Courtney Hollow, which borders our east and west fencelines along the river. I am one of the few full-time inhabitants in the winter, but on the summer weekends, Sunshine Bottom is a busy place where families gather to fish, boat, and play. Deer, turkey, and water fowl hunters visit in the autumn.

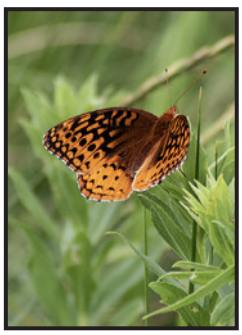


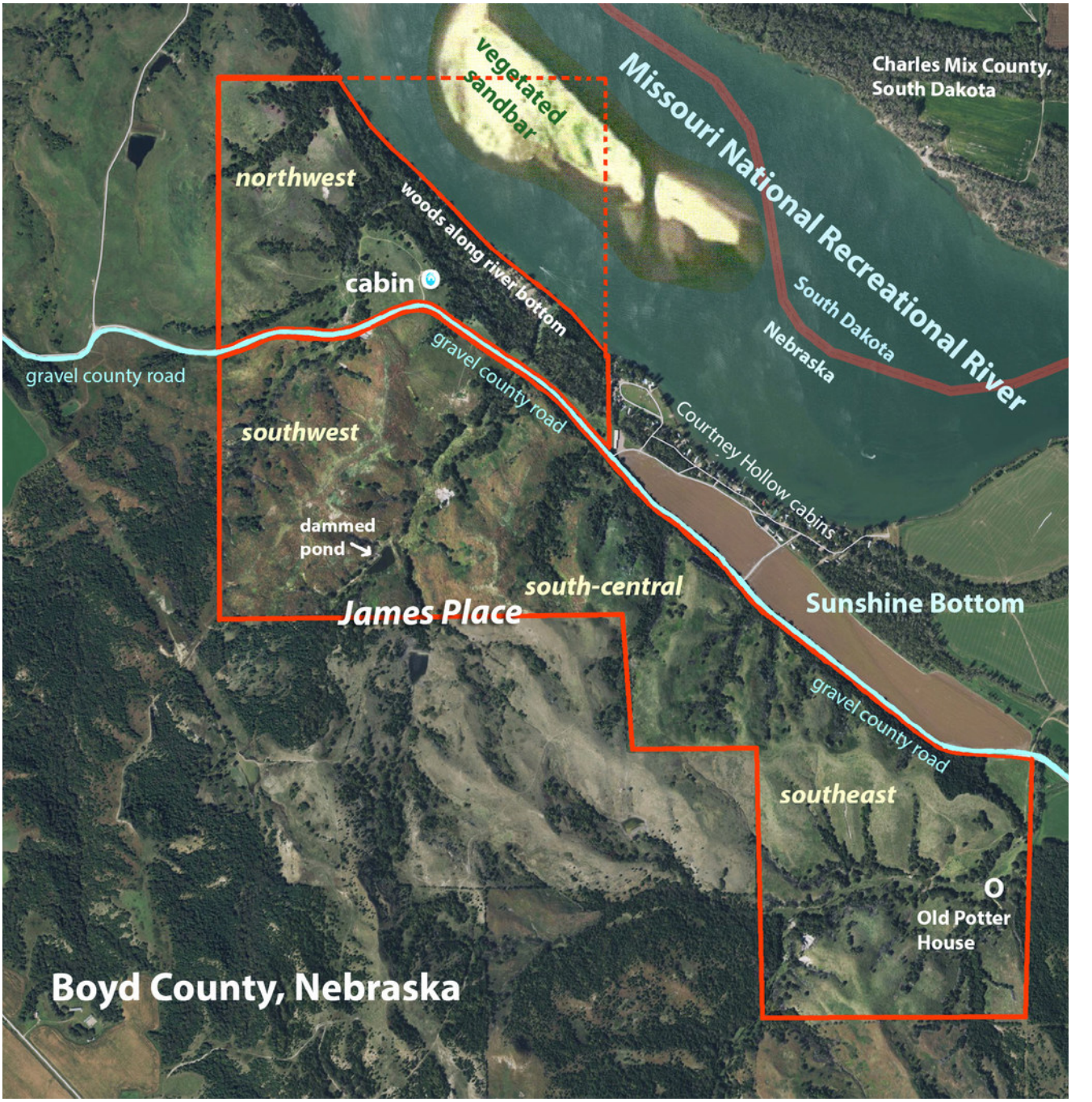
Some of My Neighbors

These are some of the mammals, birds, reptiles, amphibians, and invertebrates I've photographed on the James Place. Many of these characters are permanent inhabitants, some visit for the summer, and others just pass through. I've also seen raccoons, beavers, badgers, skunks, and one fox, and there are many more that I've seen at a distance or witnessed tracks, scat, or tunnels. Each is part of the intererconnectness of the land, river, animals, plants, and sky (sorry, fish—I didn't include you).









The James Place

Using a Google map as a base, I outlined the boundaries of the James property in red. (A large portion of the vegetated sandbar is considered part of our property, and I indicated the approximate area with a dotted line). The light blue line shows the gravel county road that divides the north from our southwest pastures, and which defines the propery line along the southeastern side as it passes through Sunshine Bottom. I took a screenshot of the satellite image on November 11, 2021, but I'm not sure when it was recorded.

Walking the James Place

I have always loved to walk on city streets, but walking on this hilly land is a different challenge. Cle Murphy, who was a neighbor on the southeast side of the James Place, first taught me how to hike along the tops of the hills in the early 1970s, and I've been doing it ever since then. I enjoy the exhileration of moving my body along the earth. Cow paths lead me through tricky places, and I crawl on my hands and knees down sides of draws, and over or under downed trees trunks and branches. After a rain, my boots become heavy with the thick mud we call "gumbo," and many of my jeans have holes from climbing over barbed wire fences. I've had only one close encounter with a rattlesnake, but its warning sounds allowed me to walk away. I've been startled when I almost stepped on fawns or turkeys hidden in the grasses, and there are many things to trip on, so I often use a hiking stick to steady myself on the uneven terrain.

Walking in the hills often gives me a sense of flying. Although I live a fairly solitary life, I don't feel alone when I am out there. I am embraced by the light and the vast open space, and I'm engaged in the wonderful process of *seeing*. When the grass is low, I can see that the hills are like long spines pointing down toward the river, with smaller, perpendicular ribs separated by draws. Draws are often lined by deciduous trees, and the deeper draws become dark, intertwined channels of branches, dead leaves, downed tree trunks, and shadows. Occasionally I find cow or deer skulls and bones in the grass.

Each season and time of day offers its own array of sensory qualities. In the spring and summer, dense sounds that fill the air include the buzz of bumble bees, the insistent drumming of woodpeckers, and the lilting melodies of Western meadowlarks and other songbirds. Bobwhite quail and I often have call-and-response conversations, and the bellows of cows and the haunting yips and howls of coyotes are common voices around me.

In the quiet of winter, I enjoy hearing great horned owls in the river woods and the surprisingly light calls of eagles soaring above the river. Snow cover allows me to to observe the structure of the land and to notice the tracks of animals that weave through the hills and woods. In the spring I may suddenly smell the sweets aroma of clove currant shrubs or the perfume of wild plums, and in mid-summer I am treated to the spicy fragrance of wild bergamot. Walking through catnip, marijuana, and eastern red cedars brings out their distinctive scents. The aroma of yellow sweet clover permeates the hills in early summer, and smells of decaying plants are pervasive in the fall. The ubiquitous cow pies add a pungent aroma to the hills and the woods, especially in the autumn. And no matter what the season, the wind pushes through the trees and grasses and snow. Its sound and force against my body is an almost constant companion.

The photo above was taken in the southwest pasture looking east, on August 15, 2022, with the sun at my back.

Upland Prairie

This region of Nebraska is mixed-grass ecoregion, with both tall and short grasses. In many areas of the James Place, especially on the south side, native grasses (big bluestem, little bluestem, Indian grass, sideoats grama) are becoming more abundant. But in too many areas, I'm sad to see that smooth brome is still the main grass. Because of the hilly terrain, very little of the James Place has ever been plowed for crops, and no acres have been plowed in over 65 years. Two local farmers currently lease our pastures for grazing cow-calf pairs. A barbed wire fence divides the south pasture in half—ideally, cattle are put on the southeast side in mid-May, moved to the southwest side in August—where there is a rural water tank—and taken out in late October. Alternating pastures prevents overgrazing and helps maintain healthier soil and a greater diversity of plants.

Missouri goldenrod and snow-on-the-mountain growing on a hilltop in the south-central pasture, August 28, 2021.

Cows are picky about what they eat, and they ignore thorny and ill-tasting plants. The flowering plants shown here are Flodman's thistle and stiff goldenrod. Much of the grass, especially on the north side, is smooth brome, a cool season species. Although it provides adequate forage, it is not a native grass and tends to dominate native grasses and forbs. North side, August 27, 2015.

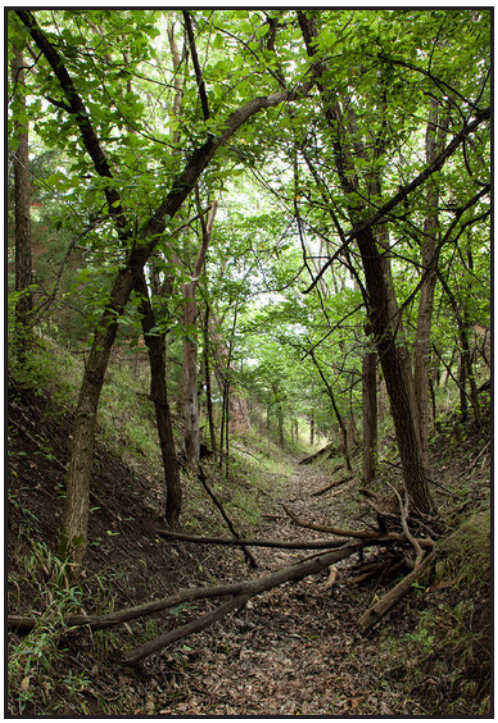
Prairie plants provide vital nourishment to insects, birds and mammals. Many upland plants, including these ground plums, provided sustainance to American Indians and European-American settlers. South-central, June 11, 2021.

Plant species vary from pasture to pasture, depending on factors such as soil type, sun, and grazing patterns. Among the plants shown on this dry hilltop are pale purple coneflower, rigid goldenrod, Western ragweed, shell-leaf penstemon, daisy fleabane, and prairie coneflower. Southeast, June 15, 2017.

Woody Draws and Trees

Rain, snow, and spring water drains through shallow and deep draws on its way down to the river. Many of the draws are intersecting and multi-leveled, particularly in the far southwest and southeast corners of the James Place, and there are many species of plants that grow along them. Although some deciduous trees are scattered in the open grasslands, many trees are found in the woody draws, especially bur oak, which is a keystone plant on which many kinds of wildlife depend. Other trees in the hills include black locust, green ash, and American elm. Eastern red cedar trees are an ongoing problem in draws and uplands.

A woody draw in a southwest pasture features numerous bur oaks and other deciduous trees. The deeper draws provide a good refuge for wildlife. June 11, 2021.



A view of a deep draw at the bottom of two steep hills. Draws are usually dense with trees, shrubs, vines, forbs, and decaying matter. In wet seasons they filter water on its way down to the river, but they are often dry. Southwest, August 10, 2014.

Disturbed Ground

There are many ways that the earth—whether upland, lowland, or in the woods—can be disturbed, including floods, drought, overgrazing, motorized vehicles, controlled burns, incorrect chemical spraying, and mechanical cedar cutting. Plants are usually quick to fill in disturbed areas, but not always in desired ways. Weedy forbs, especially noxious weeds, are happy to fill in bare spots. But other so-called weeds often serve as beneficial placeholders until grasses can replace them. Unfortunately, some cool-season grasses (especially smooth brome and cheatgrass) can become dominant and crowd out the diverse native plants and grasses that are necessary for a healthy ecosystem.

Plants on this disturbed ground include snow-on-the-mountain, buffalo bur, Western ragweed, ground cherry, mare's tail, heath aster, and marijuana. Tree-covered hills in the background are neighboring property to the southwest. August 13, 2018.

Shifting Ground

Growing up in a flat suburb of Chicago, I naively imagined that the ground underneath me would always stay stable. This myth was reinforced by the abundance of concrete sidewalks and streets that surrounded my family's house on its small plot, and it was strengthened when I lived in apartments in large cities, surrounded by lots of concrete and a limited amount of green land and trees. My time living on the James Place, however, has shattered my notions about ground being unmovable! Land is in constant motion. As water flows and freezes, the soil expands and contracts, and the earth shifts and slides and erodes. Observing this phenomena, even over a small period of time, has helped me begin to understand how the hills, valleys, and river may have been shaped over many millenia.

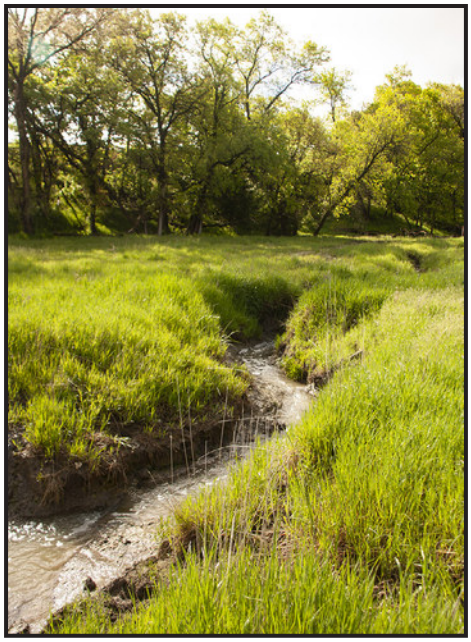
Sliding ground is becoming more pronounced in many areas on the James Place. Tall grasses often hide unexpected drop-offs caused by land slides; I've learned that lesson the hard way when I've suddenly tripped on a steep ledge or into a deep crack. Now I use a walking stick to stay upright! Southwest, May 14, 2022.

The recent landslides cover a widespread area and become deeper every year. In this photo, the slippage continues around the hill to the left and down the hill to the right. In some cases, whole patches of grass slide down to the next level, and other plants and shrubs are filling in the bare areas. Gradually, the edges of some of these ridges are softening as cows, rain, snow, and wind wear them down. Southwest, February 4, 2022.

Land slides don't care about barbed wire fences or property lines. In this photo, most of the sliding began on our neighbor's property, but it is moving down our place and taking part of the fence along with it. The crevices are becoming deeper each year. I took this photo from a southwest bluff above the county road, looking toward our northwest pasture. The red line indicates our fenceline/border as it runs through the middle of the land slide. May 31, 2020.

Carving the Earth

Among the many factors that shape topography are water and soil type. A USDA Soils Inventory Report about the James Place describes eight different kinds of soil here; most are varieties of silty clays, with a few areas of loam. There are also some explosed pits and bluffs with compacted clay, gravel, sand, or shale. Boulders, especially on the far northwest bluffs, occasionally protrude from the ground, but they are not common.



This narrow, creek-like channel is part of a larger system of draws carrying water down from the southwest hills and through a large culvert under the county road. Lowland draws are sometimes filled with fast-flowing water during wet springs, but they often dry up later in the summer. I used to be able to drive my ATV across a part of this draw. Northside, May 24, 2019.

In wet springs, water in this draw leads to the river bottom, then flows through the woods and down to the river. This photo was taken after a summer of severe drought, when the draw was completely dry. Northside, September 25, 2022.

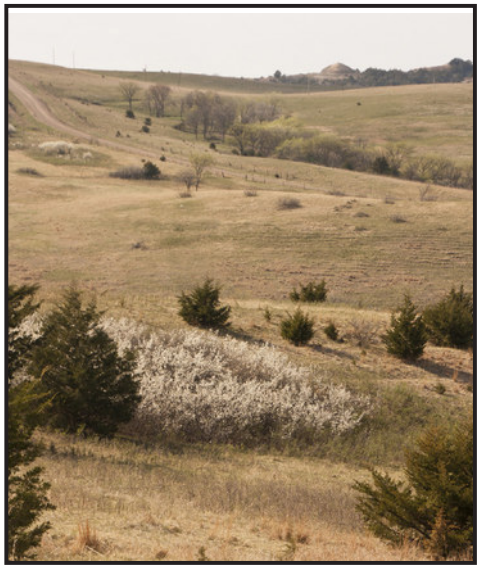
In addition to water, cattle play a part in shaping the earth. Groups of cows often follow each other in lines, and over time their hooves carve paths like this or wear down the sides of hills. Over time, they also smooth out some of the ridges of landslides. South-central, September 19, 2022.

Most of the transformations in the earth have happened over a very long period of time, including this steep, exposed clay bluff in the southeast pasture, about 35' above a wide valley that cuts between hills. Southeast, August 25, 2022.

Shrubs

Woody shrubs are a common and often beautiful part of many grasslands. Clove currant, wild plum, choke cherry, and prairie rose add color and scents to spring, the sumacs turn rich red and orange in the fall, and the berries of many shrubs can be used in pies and jams. Shrubs are also a vital resource for wildlife, both as a protective cover and as a food source. On the James Place, dense thickets of buckbrush and smooth sumac are expanding in the hills. Unfortunately, when shrubs colonize large areas, they often block out other beneficial native forbs and grasses that are important for a diverse ecosystem.

Gooseberry shrubs in the river woods, May 26, 2020.



A large wild plum thicket blooms in a southwest pasture. Old Baldy is at the top. April 16, 2015.

Many shrubs, including the smooth sumac and buckbrush shown here, spread by underground root systems that are not usually damaged by controlled fires. They can take over large areas and inhibit other plants beneath them. Shrubs are increasingly troublesome in the pastures on the south side. Southwest, July 24, 2022.

Gravel county road

A winding county road and barbed wire fences divide our north pasture (left side of photo) from the hilly south pastures (right). The road follows along a small bluff going east through Sunshine Bottom. Passing vehicles from outside locations may spread seeds—there are several plants along the road I haven't seen elsewhere on the James Place, including Jerusalem artichoke and Wahoo shrubs. During road construction in 2021, many of the deciduous trees along the bluff were cut down, and some of the plant population along the road has changed. For example, the slender dalea growing at the base of this hill was destroyed, but Russian thistle is now spreading along the road.

Yuccas grow on this compacted clay and shale hill on the north side of the county road. This is one of only two places that ten-petal mentzelia and cream milkvetch grow here. October 13, 2015.

Lowlands and Ponds

Water from rain, snow, and a few natural springs flows through shallow and deep draws from neighboring hills in the south on its way down to the Missouri River. Broad, lowland valleys have likely been been shaped in this way over a long period of time. The two earthen dams on the James Place were constructed in the early 20th century to catch some of the water flowing through these valleys and draws and to provide watering places for cattle.

During wet seasons, water can be many feet higher in the large pond, with water plants and algae growing along the edge. It is still fairly low here after the drought in 2022. I'm standing on the dam itself, looking down on the water and southwest toward neighboring properties in the distance. South-central, June 27, 2023.

This small dammed pond is filled by water coming through draws from the southwest hills. In dry seasons, however, the pond is often empty of water. Southeast, June 4, 2020.

Lowland areas are often wet, especially in the spring. This one is on the far southeast side, near the small pond in the photo above. Small yellow buttercups grow here among sedges, and the tall, feathery grass is foxtail barley. June 15, 2020.

Western ironweed, American germander, and pale dock are shown in this lowland meadow northeast of the large dammed pond. After flooding in 2019, cordgrass became increasingly dominant here, but these forbs remain. South–central, September 13, 2022.

River Bottomland and Bank

The bottomland along the Missouri River has been shaped over many years by water coming from two directions: as it flows down through draws from the southern hills, and by the force of the river against the northern banks. Those changes are especially significant when there is extreme flooding. In 2011, the record high water levels of the Missouri River inundated the bottomland and added to the undercutting and formation of gorges along the river bank. And after the historic bomb cyclone in 2019, water from melting snow and rain poured down from the southern hills, turning parts of the bottomland into a lake and carving even deeper gorges into the banks.

Even in normal years, water is continually shaping the bottomland. Dead leaves, rotting tree trunks and branches, mosses, and fungi create a valuable environment for insects and other wildlife. Some species of plants grow in the these woods that I haven't seen in other woody areas in the hills, including meadow anemone and wild columbine, and it's the only place I've found morel mushrooms.

Common trees along the river are cottonwood, cedars, American elm, box elder, and hackberry. Gooseberry shrubs thrive under the trees, and vines, including river grape, moon seed, and poison ivy, wind through the trees and shrubs. In the winter, animal tracks crisscross the woods, including beavers, bobcats, white tail and mule deer, fox squirrels, and coyotes.

Proximity to the Missouri River creates a rich ecosystem on the bottomland. Gooseberry shrubs and catchweed bedstraw thrive among the grasses in this photo; the river is to the right. Much of this area was underwater in 2011 and again in 2019. May 15, 2017.

There is abundant evidence that beavers like to gnaw on trees along the river. Many trees have been downed by beavers and flooding. January 20, 2021.

I often see animal tracks in snow, but the tracks at the bottom of this photo were made by my own snowshoes as I walked along the bottom of the bluff. The bluff is somewhat terraced: the cabin is above the trees on the left, with another level below it; this path is on another level; then the ground drops to a broad area that extends to the bank above the river. December 14, 2022.

Spring plants in the river woods include common blue violet, catchweed bedstraw, and slender fumewort (yellow flowers). Two morel mushrooms are shown in the bottom right corner. May 16, 2018.

Every spring, this colony of wild columbine grows on the side of a small draw in the river bottom, which is the only place I've found it. May 26, 2020.

Undercutting along the bank is caused by high river levels. Erosion is causing many trees near the edge to fall into the river, taking chunks of land and grass down with them. Although many neighboring properties have rocked their river banks to prevent erosion, most of ours is still natural. We've lost a lot of ground along the bank, especially after the 2011 flood. In addition, cattle graze in the woods and create paths down to the river that further erode the banks.

Several more cedar trees collapsed along our eroding river bank after a winter with heavy snowfall in 2022-23. Trees often take chunks of land down with them. The river is usually quite low in early spring. Looking upriver toward exposed sandbars, April 30, 2023.

Purple loosestrife, a noxious weed that chokes out desirable native plants, thrives in wet areas. So far, I've seen only small colonies on our bank, but it is spreading along neighboring banks and on the sandbar. Looking downriver, August 11, 2017.

The Vegetated Sandbar

Land under the Nebraska side of the Missouri River, including sandbars, is considered to be the property of adjacent landowners (in South Dakota, the state owns the land under the water). River levels on this 39-mile stretch of the MNRR are controlled at the Fort Randall Dam by the Army Corps of Engineers. The amount of water discharged changes daily and seasonally, depending on the diverse and often competing needs of the wider Missouri-Mississippi River system, which include the well-being of the natural ecosystem, as well as human activities like fishing, recreational sports, boating, commercial barges, and agriculture. All of these systems and interests were affected during the massive flooding of 2011. In this area, bottomlands were flooded, cabins in Courtney Hollow were submerged, and almost all of the sandbars were underwater. But when water is held back—especially in late fall and winter—the river can look like a sandy desert. I've even seen small aircraft land (illegally) on a large bare sandbar.

The vegetated sandbar is often dominated by cockleburs, winged pigweed, Russian thistle, and white sweet clover. Other common plants include plains sunflower and common evening primrose. Small to medium sized cottonwood trees also grow on the sandbar; a number of larger cottonwoods were killed in the 2011 flood. Looking upriver toward Fort Randall, July 19, 2017.

Rivulets often run through the large sandbar in high water seasons. Much of the vegetation, like these sandbar willows, become partially submerged, and algae thrives in the water. Looking upriver, August 6, 2019.

I enjoy kayaking out to the large, vegetated sandbar and walking around it. The trees in the background in the south are the river woods on the James Place. July 17, 2018.

A piping plover walks on the edge of a sandbar. This little bird is on the federally-threatened species list. August 31, 2018.

Least terns are on the endangered species list. June 26, 2017.

Piping plovers and least terns need bare sand for building shallow nests to lay their eggs. To help these endangered birds begin to thrive again, some sandbars along the MNRR are restricted for human use by the Army Corps of Engineers. Some restricted sandbars are sprayed by helicopters to prevent plants from growing. As a scientific control for research, however, the Corps has left vegetation on the large sandbar to grow naturally. I included many of the plants that grow there in this book.

The vegetated sandbar has a rich ecosystem that is different from the nearby woods and grasslands. Several species of plants that aren't found in other areas of the James Place, like scouring rush, thrive on the sandbar. I can only imagine the variety of invertebrates that make the sandbar their home. Thousands of Canada geese and other waterfowl stop along the river and sandbar during their spring and fall migrations.

A large colony of perennial scouring rush grows on the northside of the sandbar. They are part of the Equisetaceae family of ancient primitive plants. Looking south, June 6, 2018.

The river and sandbars are filled with noisy gaggles of Canada geese during their fall and early spring migrations, A wide variety of waterfowl, including ducks, geese, American pelicans, and ring-necked gulls, also land on the sandbars. Sandhill cranes pass over the sandbars, but they usually fly much higher in the sky. March 15, 2017.

A dragonfly clings to a stem. Sandbar willows are shown in the background. August 6, 2019.

Learning to Take Care

My father grew up about two hours southwest of here in the Nebraska Sandhills, which is a different ecoregion from this mixed grass, riverine property that he purchased many years later. Although he knew that cedars and muskthistles were a problem on the James Place—and he did what he could to try to manage them during his visits from Chicago—he didn't have the knowledge, time, or resources to effectively confront these issues. These invaders have only have only increased since he was alive, and now noxious Canada thistles, leafy spurge, and purple loosestrife have became additional problems. Since the only plants I ever tried to manage before I moved here were dandelions and creeping charlie, I had a lot to learn about caring for the land!

A local friend taught me how to navigate the hills on a 4-wheeler and to spray muskthistles and Canada thistles. Other friends and agencies have also been excellent teachers, including biologists with the National Resource Conservation Service (NRCS) and the Northern Prairie Land Trust. I've attended a number of conferences about prairie restoration and land management held by organizations including the Prairie Enthusiasts and the Nebraska Natural Legacy, and I took part in a Conserving Fragmented Prairies workshop sponsored by The Nature Conservancy and Prairie Plains Resource Institute.

The words "take care" refer not only to the pragmatic aspects of land management, however, they are also about developing reverence and empathy. Land and plants do not exist in isolation—I also needed to learn about the invertebrates, mammals, birds, and reptiles that call this place home. To begin to understand the larger environment, I became a Nebraska Master Naturalist and joined the board of the Friends of the Missouri National Recreational River. I also turned to authors who reveal poetic and cultural perspectives of the natural world, including Aldo Leopold, Robin Wall Kimmerer, and Paul A. Johnsgard.

Taking care of land often means considering conflicting needs, and I've had to learn through a number of lenses: as a landowner who rents out pastures for cattle grazing; as a neighbor to other landowners; as an artist who wants to express her thoughts and feelings about a place; and as a citizen of the world who hopes to contribute to a sustainable, vibrant, and healthy environment. I don't always get it right.

Most of the trees on this neighboring property are Eastern red cedars they have chosen not to remove. This dense coverage is an example of what happens if cedars are allowed to spread without intervention. When rain and sunlight are blocked by mature cedars, beneficial grasses and plants can't grow under them. Southeast, July 1, 2021.

These branches of a mature female cedar tree are covered in hundreds of soft, blue, berry-like cones. Although berries that drop on the ground may sprout, seeds are most effectively spread through bird and mammal droppings. Northwest, November 24, 2022.

Eastern Red Cedar Control

Probably the main thing I've had to learn about taking care of land is how to control invasive plants, especially noxious weeds and Eastern red cedars (*Juniper virginianam*, which are actually in the juniper family). As is happening throughout the Great Plains, cedars are overwhelming grasslands in Nebraska. Open prairies were historically maintained by fires set by American Indians and by natural causes like lightning, but the growth of towns, cities, and other development have made these methods dangerous, except in controlled burns.

Though native to this area, Eastern red cedars are fast-spreading trees that inhibit native plants and grasses and harm native grassy ecosystems, including wildlife. Cedars also destroy the natural beauty of prairie landscapes and cause financial damage. In Boyd County, for example, many farmers raise cattle, and cedars in pastures can reduce their livelihood. I lease the James Place pastures to two local farmers for grazing, so in addition to my concern about the health of the ecosystem, I want to make sure that the pastures have good forage for their cattle. Plant diversity is key to a healthy ecosystem, and cedars can create unhealthy monocultures.

Over the years, I've used clippers, loppers, and a small curved handsaw to hand-cut at least 15,000 small and medium-sized cedars, but my labor-intensive approach is definitely inadequate to deal with the scope of cedar encroachment. In 2009, I was glad to learn that the NRCS offers Environmental Quality Incentives Program (EQIP) grants to landowners to help with cedar control. I have received two such grants, which paid part of the cost of hiring professionals to cut down medium to large cedars on both the north and south sides, many of which were decades old.

A worker on a skid steer pushes cut cedars into a pile at the edge of a draw. It's amazing to me how the professionals are able to cut and stack trees on such hilly ground. The stacks of cedars (sometimes as large as 25' x 40') are left to dry out for at least a year before they are burned. South-central, March 30, 2017.

Three professional tree removers use skid steers (circled in red) to cut and pile Eastern red cedars in the south-central pasture. They cut the small cedars in the foreground on the following day. It took them nearly three weeks to complete the cutting in the south-central and southwest hills, March 30, 2017.

Controlled Burns

Although mechanical cutting eliminates established cedars, that is not the end of the problem. Mature female cedars leave thousands of small, blue berries on the ground after they are cut, and birds and mammals can spread seeds in their droppings. Many of those seeds grow into trees, which means that the cedar encroachment problem starts all over again! Fire is generally the most effective way to destroy berries and the small to medium–sized cedars that often remain on the ground after cutting. Burning also destroys the large stacks of cut cedars. In addition, burning clears out ground thatch and dead plants and trees, creating opportunities for new plants to emerge and encouraging habitat diversity.

Several years after the first cutting in the southeast and south-central pastures, I applied for another EQUIP grant to help with additional cutting in the southwest and north pastures, and to conduct a prescribed burn in the south pastures. The NRCS approved a burn for the spring of 2018, but windy, wet weather prevented it from being fully effective. A second controlled burn in 2021 was more successful because the weather was warmer and drier. Leaving pastures ungrazed during the summer before a controlled burn ensures that there will be enough fuel for an efficient burn the following spring. Even with abundant grass, however, it's often difficult to find the right day to burn. Spring weather can be unpredicable, with too much wind or moisture to ensure an effective and safe burn.

Controlled burns destroy most cedar trees, but they leave many mature decidous trees—especially bur oaks—untouched. This fire burned around the bottom of these green ash trees, but left most of the trees undamaged, and I was glad to see new spring leaves emerge a few weeks later on many of the deciduous trees. The fire also opens areas for small bur oaks to thrive. South central, April 3, 2021.

Firebreaks are set along outside perimeters to contain the fire within the desired areas. Although it is well-controlled by fire fighters, fire takes on its own life as it flows across the ground. Some areas take a while to catch on flame, and others remain untouched. As the flames travel, they consume small, medium, and some larger cedars, as well as thousands of cedar berries on the ground. The fire does not generally destroy rhizomatic roots or plants that have not yet emerged. April 3, 2021.

I was very glad to see more native grasses and greater wildflower diversity in the south pastures after the two controlled burns. The north pastures, however, have never been burned, so smooth brome grass still dominates, and there is less forb diversity.

A line of fire in the 2018 burn works its way up the hills and through the south-central hills. The NRCS prescribed plan was to burn the whole south side in one day, but the crew decided to stop early because the winds had become too strong. To protect nesting birds and other wildlife, the NRCS has a May 1 cut-off for burns, but special permission was granted to finish the remaining area the following weekend. April 28, 2018.

Lynch volunteer fire fighters carry water tanks on the rear of their 4-wheeler to spray renegade flames and make sure nothing gets out of control. Even after the firefighters have stopped for the day, at least one person remains behind all night to keep checking for smoldering trees and sparks. Southeast, April 3, 2021.

I was fortunate that the Lynch Volunteer Fire Department was willing to conduct both burns here. In the 2021 burn, Nolan Wickersham uses a torch to set a firebreak, and Clay Classen sprays water on renegade flames from his 4-wheeler outfitted with a battery-operated tank. Firelines were also set along the county road and our other property lines. Southeast, April 3, 2021.

Fire poses potential harm to wildlife. but many animals are able to escape before the fire spreads. These mound-building ants were active in their home soon after fire skimmed off the top. Grass was already growing back, less than two weeks after the burn. South-central, April 16, 2021.

Noxious Weeds

It was a pleasure to see the pastures in the weeks immediately after two controlled burns removed hundreds of cedars in the south pastures. Native grasses returned in some areas where non-native smooth brome had dominated, and an abundance of native prairie plants dotted the hills. But I was sorry to discover that cutting and burning cedars left me with even more challenges. Bare ground was exposed where no grass had grown for a long time, and the ashes from the burns provided a wonderful fertilizer for noxious weeds to thrive. In addition, underground roots of many forbs and shrubs do not usually burn, so unwanted plants that spread by rhizomes, such as Canada thistles and smooth sumac, became even more abundant. I was dismayed when I realized that my efforts to control the cedars left me with a lot more work to do!

Four species of noxious weeds grow on the James Place, which I am legally required by Boyd County to remove: Canada thistle, muskthistle, leafy spurge, and purple loosestrife. I think of these plants as the cockroaches of the plant world—they are hardy, invasive, and difficult to control.

Every spring, early summer, and late fall I go out to spray what I can. I would love to use gentler methods, but these plants have become so invasive over the years that chemical methods are the most effective way to deal with them. Using goats for weed control is a nice idea, but not on so many acres—and, unfortunately, goats like to eat the native, beneficial plants along with the noxious ones. So although I don't like using herbicides, spot spraying is the most effective way for me to control noxious weeds until more desirable plants can take over.

The Canada thistles shown above were growing along a shallow draw. Their downy seeds are disbursed by wind, but it is their rapidly spreading underground rhizomes that make them an especially obnoxious noxious weed. On the hilly James Place, Canada thistles work their way through miles of draws, open pastures, the river woods, and along the river bank. I try to control them by spraying, but if I miss even a small area, the roots continue to create colonies. Spraying in the spring can keep them from spreading, but fall spraying is most likely to actually kill the roots. South-central, July 24, 2022.

Large muskthistle rosettes can form thick, green carpets in the autumn. In the spring, these rosettes develop stout stalks, multiple branches. and many large flower heads. If there are not too many rosettes in an area, I sometimes use a spade to "chop" the roots below ground level, but most of the time I try to spray them before the seed heads form. Southwest, October 15, 2016.

I need a license to buy some of the herbicides, and, since they are potentially harmful, I always wear an N-95 mask, a billed cap, waterproof gloves, and long pants and sleeves—all of which get very hot in the summer. Although I do most spraying on foot, I drive out to distant areas on my side-by-side UTV. Once out there, I walk around carrying a 1 or 2 gallon tank to spray individual plants or small colonies of them. I sometimes walk with a 15' hose connected to a battery-operated tank on the back of my vehicle, but usually the hills are too steep to spray that way safely, so I mostly walk up and down the hills and into draws to spray. I sometimes spray troublesome annuals like marijuana, tall hedge mustard, and buffalo bur when they are dominating a disturbed area—I hope to reduce their seed banks. When I can, I often spray the edges of smooth sumac and buckbrush thickets in an effort to keep them from spreading.

The steepness of the hills and draws, as well as periods of flooding, can make it difficult to drive safely from one area of the James Place to another, even with my sturdy side-by-side UTV. On this day, my vehicle became marooned in a mucky, gumbo-bottomed draw I was trying to cross so I could continue spraying. I had to walk back home, and a few days later my renter towed it out with his pick-up. The back of the vehicle holds a 15-gallon tank and several one– and two–gallon tanks. The bomb cyclone in March, 2019, destroyed the earthen dam around the small pond that provides water to cattle in the spring. Southeast, June 4, 2020.

In 2019, the noxious weed problem became more than I thought I could handle myself, so I hired a weed control professional for two days to broadcast spray from his UTV, but he couldn't drive across the wet lowland areas or spray deep into the draws. I went back to hand spraying. An alternative way to control weeds would be to hire an airplane or helicopter to broadcast spray, but that's expensive, and I don't want to kill all of the native and pollinating plants. Spot spraying by hand allows me to focus on targeted weeds and to avoid killing desirable plants. So I keep plugging away with my slow methods and am gradually making some progress.

The muskthistles shown here were relatively small, but they covered a large area. In shady woods, musk thistles can grow over 7' tall to reach sunlight. In open, sunny pastures, they are often shorter, with stout stems and multiple branches. Many of the flowers shown here had already gone to seed, and it was too late to spray them. Sometimes I pull off and burn individual seed heads, but that's only feasible when there are fewer thistle plants. Northside, July 18, 2017.

Part Two: The Plant Portraits

Despite common misperceptions of Nebraska as a flat and featureless "flyover" place, there are diverse landscapes all across the state—from the woodlands in the southeast, to the rolling dunes of the Sandhills, to the grassy plains in the center of the state, and to the otherworldly formations of Toadstool Geological Park in the northwest corner. Luckily, there are many excellent photographers who document and interpret the beauty of the land, skies, wildlife, and plants of Nebraska. Their visual and verbal story-telling brings to life the small details, expansive vistas, and spirit of this state.

I'm especially in awe of photographers who combine their scientific knowledge as naturalists with their abilities to take compelling photographs. In their photographs of plants, they have given us gorgeous images of individual blooms and other botanical details that we might not normally notice. Jon Farrar, for example, who worked for *NEBRASKAland Magazine,* photographed and wrote the *Field Guide to Wildflowers of Nebraska and the Great Plains,* which was the first book I used for information about plants. I've also turned to the work of Chris Helzer, Director of Science for The Nature Conservancy in Nebraska. In his blog, *The Prairie Ecologist,* Chris combines photographs, science, humor, practical information, and humility to tell stories about plants and insects within prairie ecosystems. His macro lens reveals the tiniest hairs and textures, and he makes even dried up seed pods look beautiful. These, and many other photographer/naturalists, have informed my understanding of plants and place.

Although I take photographs, I don't think of myself as a photographer. I am, at heart, a sculptor who loves to put parts together—in this case, it's photographs. When I work with wood, I cut, add parts, move things around, and refine edges. I am aware of how shapes lead to other shapes, how light, darks, and colors create emphasis and movement, and how all the parts "flow" together. When I make photoconstructions of the James Place, the photographs become like found objects that come together in a new, unified composition. And even though I use a camera and computer, it is not a mechanical process—underlying all of my work is artistic thinking.

Looking west toward the top of the county road. January 10, 2022. Northside.

Making the Portraits: Artistic Thinking

The arts challenge us to think creatively and critically, and to make aesthetic connections to our own emotions, experiences, and culture. I like to think of that process as "artistic thinking," and it can apply to both making and experiencing art in any form. When I was teaching at the University of Minnesota, my main questions were: What is artistic thinking? Why does it matter? And how can students from diverse backgrounds, interests, and abilities learn to think artistically? During the years that I was focused on these questions, I did very little art-making of my own. After retiring and moving to the James Place, however, I wanted to start making art again.

To get started, I considered what was available to me here. To begin, I experimented using peeled cedar branches as a sculptural medium, but that didn't take me very far, and I didn't have a sculpture studio. What I did have here, though, was an abundance of land, river, plants, and sky. And I had other skills, including experience with Photoshop and knowing how to think artistically. I decided that photography would be the best way to learn to see my new environment, so I challenged myself to use photographs in a way that made sense to me. Instead of a sculpture studio with wood and tools, my studio is now found in my natural environment, my SLR digital camera, my desktop computer, and Photoshop CC.

When I constructed abstract wood sculptures, I loved cutting, sanding, joining, moving parts around, standing back and looking—and then going back through that process again until the sculpture "worked." Now I use photographs instead of wood, but movement is still a part of my process. I am a peripatetic photographer—the shots happen when I am out walking on the James Place. I'm not comfortable carrying or using a tripod; instead, I hand-hold the camera, sometimes bending over or getting on my knees or stomach (and hoping that there are no chiggers or ticks nearby!). Some days may be too windy, cloudy, or sunny for good shots, but I take photos anyway, even if the circumstances aren't good. I enjoy making use of what I have—it's not important to me to find a perfect shot. What matters is what I can do with it.

Composition and Metaphor

Even when I'm seated at my computer, movement is part of my artistic thinking. As I work with Photoshop, my left hand moves on the keyboard while my right hand moves my mouseas I select, cut, and refine images and move them around the boundaries of the composition. My many years of experience making and teaching sculpture, drawing, painting, and design help me make decisions about how to use visual elements like lines, shapes, colors, textures, values (lights and darks), and space. I especially pay attention to ways that the elements create movement, direction, rhythm, emphasis, variety, and unity. It is both an intutive and a critical process as I "tune" the formal qualities to make a dynamic yet unified composition.

Even if we are not always conscious of them, formal qualities, combined with subject matter (in this case, plants), contribute to the metaphoric meanings of art. All parts of a composition—including the corners—contribute to our experience of it. Depending on the ways that the formal qualities come together, four different compositions of the same photograph of a plant would have different expressive qualities. We might interpret the same plant as sad, lonely, brave, or joyous.

Formal qualities suggest visual metaphors for emotions and states of mind, and each person interprets them differently. Metaphors help us think about meanings beyond the specific plant, and we respond to personal, cultural, or universal qualities in the work. Although the Wildflower Portraits are documents of very specific plants, I hope that they are also visual metaphors for the fragility and vitality of life itself.

Taking Things Apart

Original photo of a spiderwort on a southwest hill on a rainy spring morning. Although there is little contrast among the laights and darks, with I chose this photo because of the clear curves of the leaves, drooping buds, and open blossom. May 27, 2017.

To focus attention on the delicacy of the bloom and buds and bring out the strong lines and curves of the leaves and stem, I digitally removed most of the background, though I left some grass as a counter balance to the airiness of the plant. The rough texture of the grass contrasts with the softer textures of the flower and buds, and the large yellow-orange blade of grass contrasts with the purples of the petals and the intense yellow at the center of the flower.

After going out to photograph plants, I am tired yet exhilarated from walking and looking. But I won't really know what the photographs look like until I download them on my computer and select one that I think will work best in a composition. When possible, I select a photo that includes the leaves and stem as well as the blossom, buds, or fruit. This begins the slow process of turning a photograph into a portrait that fits in my "Wildflower Portrait" series.

In the case of the spiderwort photo on the left, I wanted to emphasize the uprightness of the plant, so I cropped the photo in a vertical format—a horizontal or square format would have presented the plant differently. Then I "cut out" grasses around the plant, but not with a scissors! Digital images are made of thousands of tiny square pixels that indicate an almost infinite range of colors that define the shapes we perceive. Using Photoshop CC, I used my mouse to "draw" digital lines around parts of the plant that I wanted to keep and deleted blocks of pixels around the plant that distracted from the main focus. There are Photoshop tools that make this process go faster by clicking on an entire object, but I avoid these methods because they don't take into account the complexity of plants in their lived environments.

This slower way of working helps me really see what is in the whole composition, not just the main plant. It is time-consuming and laborious, as well as wiggly and unpredictable. As I work, I digitally adjust formal qualities, especially the lights and darks, which I dodge and burn (this process is analogous to what film photographers do in dark rooms).

When I am satisfied with the plant image, I select a photo of sky that complements the plant, then I place the plant layer on the sky layer and add a border. Even after the sky and border are added, I continue to refine things like scale, placement, sharpness and contrast. My goal is that all parts of the image contribute to a balanced, unified, dynamic composition.

The spiderwort portrait, turned upside down. The final portrait is on page 173.

On the left, I've turned the spiderwort composition upside down to illustrate how formal qualities go beyond subject matter to make unified and expressive compositions. As I worked on the spiderwort portrait in Photoshop, I paid attention to the way that shapes, colors, lights and darks, and textures led my eyes—and hopefully, the viewer's eyes—inside the boundaries of the rectangle. Instead of thinking about the "what" (the plant), I thought about the "how" (movement, balance, contrast, tension, focal point, direction, variety, etc.). I paid as much attention to the space *around* the plant as to the object itself. I was thinking that the strong lines of the curving green leaves slice through the orange and dark lavendar shapes and move my eyes out of the picture frame, but then I go back into the composition to rest on the main focal point—the flower and buds. The rough texture of the bottom grass adds contrast and variety to the smoothness of the space around the plant and the petals.

Putting Parts Together

When I choose a sky photo for the bottom layer of a portrait, I look for colors and shapes that add to the over-all composition. For example, when I was looking for a sky photo for the sulphur cinquefoil layer, I thought the rainbow photo below might work well with the plant: the red-oranges of the rainbow complement the green leaves, and the purplish sky complements the yellows in the petals. The smooth sky emphasizes the shapes of the flower and leaves, and the rounded arch gives life to the negative space around the plant. Sometimes I have to experiment with many different sky photos before I find the right one for a plant portrait. In the case of the sulphur cinquefoil portrait, I was lucky that the two layers worked well together right away.

I took this photo of sulfur cinquefoil on June 20, 2016. After removing all of the background, I looked through my sky photos for a bottom layer.

This photo of a rainbow over the Missouri River was taken on October 11, 2016. At first, I was concerned that a rainbow image might be too stereotypical, but its colors and curved shape complemented the plant layer.

To use the rainbow, I first cropped it and then flipped it over to balance the large empty space on the right side of the plant. The final portrait is on page 169.

Making the Portraits: Researching the Plants

Since moving to the James Place, I've found diverse resources that help me identify and learn about plants (a selected list of resources is available on pages 246-248). The first book I turned to was an old copy of Stubbendieck, Friisoe, and Bolic's *Weeds of Nebraska and the Great Plains (*1995, 2nd ed.*),* which I borrowed from a neighbor so I could figure out what plants were growing here. As my interest grew and I took more photographs of plants, I found Farrar's *Field Guide to Wildflowers of Nebraska and the Great Plains* (2011) and Ratzlaff and Barth's *Field Guide to Wildflowers* (2004). When I decided to include flowering shrubs and vines, I turned to Ratzlaff and Barth's *Field Guide to Trees, Shrubs, Woody Vines, Grasses, Sedges, and Rushes* (2007). Each of these books feature Nebraska-based plants. Over time I collected many more books, including some that featured plants found by the Lewis and Clark Expedition. In addition, I found various books about cultural, medicinal, and culinary uses for plants.

To expand my understanding of the plants—and to identify some of those plants that I couldn't find in my Nebraska books—I also turned to websites, often from neighboring states. This area of Nebraska has plants that thrive in woods, tall and short grass prairies, and wet and dry ecosystems, so I extended my search to websites in nearby states like Colorado, the Dakotas, Kansas, and Iowa. My favorite online sources became *A Field Guide to the Flora of Minnesota,* for its clear descriptions of plants, and *Illinois Wildflowers,* for its identification of species of birds, invertebrates, and mammals that utilize specific plants.

Much of my formal education was in the arts, curriculum and instruction, and qualitative research—but not botany or biology. I knew I was approaching the subject of plants as an amateur, so to verify plant identification and other information, I consulted at least three different sources for each species I found. As I continued in my research, I began to notice discrepancies among sources. These differences helped me look more closely at each plant to see if there was anything I missed, but conflicting information sometimes confused me. For example, common names for plants vary by regions and sources. I usually used names that I heard locally or found in Nebraska sources, but I've included some alternative common names in the text.

Some writers use precise scientific terminology for all parts of the plants; these descriptions are elegant and valuable, but I don't have enough background to use them effectively and consistently. Other writers use language that is more easily understood by non-scientists, and I usually chose this approach. I tried to describe parts of the plants accurately, but I know I sometimes confused things like calyx, sepals, and petals; or I called a stalk a stem, or I failed to describe something important about a species. Because the plant portraits don't give a sense of scale, I included approximate measurements, which I usually obtained from the resources.

As I started to put this book together, I decided to group species into plant families, and that is the order in which the plant portraits are presented. But that approach became problematic because the resources I used sometimes disagreed on which family a species belongs in. In addition, some of my plant portraits may be wrongly presented under the name of its subfamily. To simplify categorization in the book, I grouped pea/bean/ legume together as a family, as well as sunflower/ aster and amaranth/goosefoot. Over the years I worked on this book, I found that some species had been recategorized into different families, and some families had been themselves been recategorized. As genetics improve plant identification, these changes are continuing. Botanists and naturalists may cringe at my inaccuracies, and I apologize. I welcome any corrections.

So who are you?
And what on earth are you doing here?

The first photograph of the unknown plant, June 23, 2021.

The second photograph of the unknown plant, taken on July 1, 2021. The final golden prairie clover portrait is on page 58.

I noticed this plant (top left) as I walked on a dry hilltop on the far southeast side in late June, 2021. I had no idea what it was, and as far as I knew, I had never seen it before. This lacy plant on the hill presented another research challenge for me!

When I first started identifying plants on the James Place, I was not aware of the plant identification apps that are available for smartphones. Instead, I used traditional methods of books and online searches to figure out plant species, and I still prefer this slower method because it suits my "wiggly" way of thinking and helps me expand my resources.

I stopped to study the plant for a while. The fuzzy, cone-shaped buds were unknown to me, but in other ways the plant was familiar: the compound leaves had five small leaflets at the ends of short stems, which reminded me of clovers in the pea family, and the structure of the plant was similar to purple prairie clover. I pulled apart a bud, but there was nothing remotely purple there.

I took a photo of the plant and went home. About nine days later, I was out walking again when I found the same plant. This time it was blooming, and I noticed sparse yellow petals near the bases of the flower heads. I took more photos of it, and when I got home, I searched my usual Nebraska wildflower books, but I had no success. Then I happened to be looking at photos in Chris Helzer's *Prairie Ecologist* blog, and there it was, on his page about the eight prairie clover species in Nebraska! I leearned that this beautiful plant is golden prairie clover (*Dalea aurea*).

So what *was* this plant doing there? Circumstances were good that summer for many native wildflowers to thrive. Cows like to eat prairie clover, and in previous years they may have consumed the foliage of these plants before they flowered—and before I noticed them. But the pastures were left fallow in 2021 when our fencing was removed for road work, and many native plants bloomed after the controlled burn in April that year. These golden prairie clovers were growing near several white milkwort plants, another species I'd never noticed before the burn.

Wildflower Portraits

Over the last 15 years, I have photographed 201 different forbs, vines, and shrubs that grew on the James Place or the adjacent Missouri River sandbar (I know I've missed some, and I chose not to photograph poison ivy or dandelions). All of the plants grew here naturally—none were planted. Many are in the pretty "wildflower" category, but others are considered weeds. I admire each these plants, though there are definitely some, like Canada thistle, I would like never to see again!

One thing I've learned while living here is that plants certainly do know how to get themselves around! For example, rhizomatic plants are able to spread across wide areas of an area with their underground root systems. And seed-bearing plants have diverse ways to become new plants, both locally and across the world. Seeds with silky hairs are carried away by the wind; edible seeds spread through mammal and bird droppings; prickly seeds hitch rides on fur and clothing; some seeds spread through water, and other plants eject their seeds like little cannon balls. Many seeds find their way around across oceans and boundaries in ships' cargos or other vehicles. And some non-native species, planted by gardeners for their beauty, escape backyards to become naturalized plants in wild areas.

I'm always thrilled to find wildflowers that are native to this region. Native plants historically evolved with their local ecosystems, and they are vital for the survival of native wildlife that depend on them. Being native, however, doesn't always mean that plants are good citizens. Eastern red cedars, buck brush, and smooth sumac are all natives, but they can be invasive and destructive to a grassland habitat. Naturalized plants, those not originally from this region, found their way here—often from as far away as Europe or Asia. Over time, they became habituated to their new ecosystem. Naturalized plants which are particularly harmful to the native ecosystem are legally declared "noxious" by states and counties, and landowners are required to eliminate them. As a landowner, it was important that I learn to recognize native, naturalized, and noxious plants, and I've identified them in this book.

At the bottom of each portrait, I've included the dates and locations where I originally photographed the plants (the sky photos are undated). Conditions on the James Place have changed over the years I've been here, so each portrait is a marker of a specific time and place. Most of the species appear every year, but there are a few I've never seen again. Unless they are otherwise identified, all plants in the book are forbs, which *A Botanist's Vocabulary* (2016) defines as a "broadleaf herbaceous, non-tree-like plant, often applied to non-grass-like herbaceous plants that are grazed by animals." In addition to forbs, I've included some flowering shrubs and vines, but not trees, grasses, sedges, or rushes.

Plant photos from 2010 through 2020 were taken with a Canon Rebel XSi using an 18-270mm lens. After 2020, I used a Canon EOS 80D with an 18-55mm or 70-300mm lens. All wildflower portraits are photoconstructions, but photos of the James Place in the first section are one layer, mostly taken with an SLR camera. After 2020, I occasionally used an iPhone camera to take photos of the land.

My hope is that readers might recognize a plant in the book and say, "Oh yeah, I've seen that!" Or they might notice plants growing in their own environments and ask, "So, who are you?" Or readers might decide to grow native plants in their yard or protect them in their grasslands. From an artisti's perspective, I hope that readers will enjoy the portraits for their own aesthetic qualities, but I know that 2–D images are an inadequate way to truly communicate the beauty and complexity of each living plant. So perhaps my final goal for this book is that people will go out and really, really *see* the blossoms, leaves, stems, and seeds of plants that grow around them. And, in the process of seeing, they may begin, as I did, to really care about plants and their natural environments.

Yucca

Yucca glauca

Native succulent shrub. Photographed on June 16, 2013, in a colony on the gravelly clay hill along the county road. It is scattered on other dry hills throughout the pastures.

Yucca can grow 4-5' tall. As the plant ages, it develops a woody stem with thick knobs that look like platforms below the plants. The narrow, sword-shaped leaves are stiff and sharp, with tough, thread-like fibers along the edges. The flower stalk rising from the center of the basal leaves supports waxy, cream-colored flowers that hang downwards like bells. Yucca can only be pollinated by a small, night-flying yucca moth. It spreads by seeds and lateral shoots that branch from the thick, deep taproot that makes the plant drought-resistant.

This plant is also called "soapweed." When the roots are crushed, the resulting saponin juice has been used to make a soap-like substance. All parts of the plant have had medicinal, culinary, and practical applications; for example, leaves are used in rope-making and basket weaving. Yucca may not bloom every year, so I was glad I had my camera with me when I saw these flowering.

Common waterhemp

Amaranthus rudis

Naturalized annual from Europe. Photographed on August 25, 2017, along the gravel county road. There are also some growing in the pastures, but it is not widespread.

Lamb's quarters grows up to 4' tall from a taproot, with an erect, hairy stem and arching branches. The lower surface of the wavy-edged, lance-shaped leaves have soft white hairs. Stems and branches terminate in spikes of clusters of small, light green flowers with 5 sharp sepals but no petals. Seeds are pollinated and spread by the wind.

Though it can be weedy, lamb's quarters is a valuable food source for birds and insects. Deer and livestock eat the young plants. An internet search offers sites with recipes that use the calcium and mineral-rich leaves and seeds in salads and soups. Like other plants in the goosefoot subfamily, including spinach, beets, Swiss chard, and quinoa, the vegetation and seeds of lamb's quarters are rich in valuable nutrients. Native American tribes, who cultivated lamb's quarters or gathered it in the wild, ate the greens raw or cooked, and ground the seeds into flour.

Kochia

Brassia scoparia

Naturalized annual from Asia. Photographed on August 21, 2021, along the riverbank. I had never noticed it before this year, when I found a number of kochia growing along the river and in a south-central upland pasture.

Kochia grows over 6' tall in a pyramid-like shape from a shallow taproot with an erect stem and many branches that turn red over time. The linear leaves have prominent veins and edges that are fringed with hair. Clusters of flowers in leaf axils lengthen over time to become long spikes. Each flower has a divided style at the end of a round green ovary; flowers that are both male and female have 5 stamen with yellow anthers. A 5-lobed green calyx forms the base of each flower.

This plant is wind-pollinated, and the pollen is a cause of hayfever. Young foliage is foraged by deer and cows, and song birds eat the seeds. Late in the summer, the stem detaches, and the plant rolls in the wind, spreading seeds. Luckily, the seeds only remain viable for about a year. This can be a troublesome weed that is becoming resistant to herbicides.

Lamb's quarters

Chenopodium album

Naturalized annual from Europe. Photographed on August 25, 2017, along the gravel county road. There is usually some growing on disturbed ground in the hills, especially in 2023.

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Mapleleaf goosefoot

Chenopodium simplex

Native annual. Photographed on August 25, 2017, on a shaded slope along the county road, where it became plentiful after many shade-providing trees were cut down during road construction.

Mapleleaf goosefoot has an erect stem, often with much branching. It grows over 4' tall above a taproot. Spikes of tightly packed clusters of flowers grow at the tips of the central stem and branches, and in upper leaf axils. The tiny ivory to pinkish white flowers have 5 sepals and 5 stamens, but no petals. The plant is wind-pollinated. As they mature, the fruit usually turns red and flat seeds are spread by the wind. The large, sharply-lobed leaves, which resemble leaves of maple trees, are up to 6" long and 4" wide on the lower part of the plant, and narrower toward the top.

This rather indistinct plant was easy to ignore, and I had put off photographing it for several years. But like other plants in the amaranth/goosefoot family, it has many benefits. Some beetles and moths feed on the plants, deer browse the leaves, and a few songbirds eat the seeds. Young leaves are said to be delicious when used in salads.

Oak-leaved goosefoot

Oxybasis glauca

Naturalized perennial from Europe. Photographed on June 21, 2020, on the river sandbar. I've seen a few growing along the river bank, but it is not widespread.

Oak-leaved goosefoot grows up to 16" high on erect or sprawling stems that often have distinct red and green stripes. Alternate yellow-green leaves have smooth upper surfaces and mealy-white undersides. Unlike the sharp-toothed edges of the mapleleaf goosefoot (*C. simplex*), these leave edges have shallow, rounded points. Clusters of tiny, round, bisexual flowers at the top of the stem and at leaf axils have no petals.

This weedy plant grows on disturbed, salt- or nitrogen-rich ground, and it can be an invasive weed. The oak-leaved goosefoot contains saponins, and unlike many of the other edible, nutritious plants in the amaranth/goosefoot family, websites suggest that people should limit consumption of this plant.

Prostrate pigweed

Amaranthus blitoides

Native annual. Photographed on September 6, 2019, along a gravel path, where it is common. This plant seems to thrive on gravel, and it can become almost carpet-like.

Prostrate pigweed has radiating, branching stems that grow from a taproot and form horizontal mats up to 3' in diameter. The stem tips turn upward, and small rounded leaves with whitish margins are crowded along the stems, with dense clusters of small, greenish flowers growing in the leaf axils.

Upland game birds eat the seeds. The plants can be poisonous to livestock, but they are usually avoided by them. The nutritious leaves and seeds can be eaten both raw and cooked, and dried leaves have served as a winter food source. In this image, I replaced the gravel on which the plant was growing with a photograph of sky, which makes the plant appear to float instead of covering the ground.

Redroot pigweed

Amaranthus retroflexus

Native annual. Photographed on September 13, 2020, along the east end of the county gravel road, where it is scattered but not abundant.

Redroot pigweed is a weedy plant that grows up to 5' tall on a stout, erect, ribbed stem with red or white lines above a thick, deep, reddish taproot. Large stalked leaves on the upper stems are covered in fine hairs and have prominent veins. Long, bristly spikes of small clusters of light green flowers grow at leaf axils and the ends of the central stem and branches.

All pigweeds are a problematic plant in crops. Redroot pigweed has some uses, however, especially as a food source and cover for upland game birds. Native Americans ground the redroot pigweed roots into flour. Like most amaranths, cooked and raw forms are edible and nutritious for humans. It is a common staple in many cultures, and there are a number of online recipes for ways to prepare this plant, including in salads, soups, and by roasting the seeds,

Russian thistle

Salsola tragus

Naturalized annual from Eurasia. Photographed on June 26, 2017, on the river sandbar, where it is often common. After the road construction in 2021, I've found more of them growing along the road.

Russian thistle can grow to 4' tall and wide, with an erect, red-striped stem and many branches. Young plants have slender green, fleshy leaves that become stiff and thorny as the plant matures, and the pliable stem and branches become woody. Tiny pink-green flowers develop in the leaf axils above spine-tipped bracts. When the plant is mature, stems break off to become tumbleweeds that spread seeds as they roll in the wind. Each plant can have over 250,000 seeds.

Seeds of this plant were originally brought to the US in Russian flax seed in the 1800s. Though weedy, it served a useful purpose during the drought in the 1930s when starving cattle were fed hay consisting of young Russian thistle plants. Russian thistle is one of the most common tumbleweeds. The young tips of the plant are edible cooked or raw.

Winged pigweed

Cycloloma atriplicifolium

Native annual. Photographed August 24, 2015, on the river sandbar, where it is often plentiful.

Like all plants in the amaranth family, winged pigweed thrives in disturbed soil; in this case, sandy and gravelly soil. It grows in a spherical shape up to 2.5' tall and wide, with branching stems covered with hairy leaves that often have pointed, triangular lobes. Young plants are covered in fine cobweb-like hairs. Branches end in panicles of single, widely-spaced, 1/6" wide flowers with 5 green sepals that turn inward and later cover one flat seed. The flat, round fruit is encircled by a pale, papery, fringed "wing."

Winged pigweed plants turns rusty red or purple in the fall, which makes them look like fuzzy beach balls on the sand. When mature, they break off at the base to become tumble weeds that scatter seeds in the wind. Winged pigweed can play a role in stabilizing sandy soils.

Alfalfa

Medicago sativa

Naturalized perennial from south-central Asia. Photographed on July 14, 2020, along the gravel county road, but I've also found it in the south-central pasture.

Alfalfa is internationally cultivated for hay, grazing, or as a cover-crop, but it occasionally "volunteers" to grow in non-cultivated places. It is a rapid-growing, drought-tolerant plant that reaches 3' tall. Blue-green compound leaves, with three tapering leaflets, have light lines on their surface. Round clusters of varying shades of violet to blue flowers grow on long stalks from leaf axils. Each flower has an erect upper petal streaked with dark lines, two side petals, and a middle keel.

I enjoy seeing the purple-green carpets of alfalfa fields when I drive in the country side. There are a wide range of medicinal and culinary uses for alfalfa; I remember using alfalfa sprouts in salads when it was a fad in the 1970s. Like other legumes, it fixes nitrogen in the soil. It is pollinated by bees and butterflies, and insects and small mammals feed on the foliage and seeds.

American vetch

Vicia americana

Native perennial. Photographed on May 27, 2019, among grasses in a hilly northwest pasture after a rainfall. It grows in other areas, but it is sometimes difficult to spot among grasses and other plants.

American vetch is a climbing vine with a weak, 2–3' long, angled stem emerging from a taproot and rhizomes. Compound leaves have 4–8 pairs of small, oblong leaf segments, with a long, branched tendril at the end of the leaf that winds around neighboring plants. Loose clusters of 2–9 pink to purplish flowers grow from spikes at the axils of upper leaves. A tube with 5 fused sepals surrounds the base of -one top petal, two side petals, and two fused petals that form a central keel. The fruit is a 1" pea-shaped pod, and the plant reseeds itself.

A drought-tolerant plant, it grows in many soil types, especially those that have been disturbed. Various bees and flies pollinate American vetch, and cattle, deer, and some songbirds consume the vegetation or seeds. Like other plants in the legume family, it fixes nitrogen in the soil.

Black medic

Medicago lupulina

Naturalized annual from Europe. Photographed on June 15, 2017, on a northwest hill. It is common in areas of disturbed ground, where it tends to fill in bare spots.

Black medic has multiple stems emerging from a long taproot. It is generally low to the ground, but the sprawling stems can be over 2.5' long. Tiny, round, yellow clusters of 10–50 flowers emerge on stems at leaf axils. Each flower is comprised of a broad upper petal and two side petals covering a lower central keel. The shamrock-like compound leaves have three round leaflets with parallel veins, toothed edges, and a pointed tip.

The pollen and nectar of this plant attract various bees and insects. Deer, rabbits and birds eat the foliage, and it is fair forage for cattle. The opportunistic plant spreads by seeds and tends to create colonies that fill in areas of bare ground. It is cold-tolerant, and I've seen green patches of black medic in the winter immediately after the snow melts.

Cream milkvetch

Astragalus racemosus

Native perennial. Photographed on May 9, 2017, on the small dry clay and shale hill on the north side of the gravel road. I've also seen it on the side of a steep clay bluff in the south-central hills.

Cream milkvetch grows up to 30" tall from a thick, caudex-topped taproot. Multiple erect, reddish stalks emerge from the base and branch toward the top. Alternate compound leaves have 11–31 oval leaflets with hairs on the backside and edges. Loose, droopy racemes of 20 or more creamy purplish-white flowers emerge at the axils of the upper leaves. The larger upper petal is curved upward, and the lower two petals project horizontally.

This plant, which is also called "creamy poisonvetch," is poisonous to livestock if it is consumed in large amounts, but that is not common because it has an unpleasant odor. It is pollinated by a variety of bees and known to be an indicator of soil that is rich in selenium. A number of cultures use astralagus plants for their anti-inflammatory and analgesic properties.

Crown vetch

Securigera varia

Naturalized perennial from Eurasia and Africa. Photographed June 13, 2018, growing in a medium-sized colony on a hilltop on the northwest side.

Crown vetch spreads by rhizomes and tends to form large, invasive colonies that may create monocultures. This low-growing plant is less than 2' tall, with sprawling stems that emerge from the base. Compound leaves have 12–25 rounded leaflets with pointed tips. Up to 25 pink to pale pink flowers cluster at the ends of naked stalks at upper leaf axils. The fruit are a cluster of small pods that resemble skeletal fingers.

It can be invasive in pastures, but I've only seen one patch here, and I didn't find it the following year. Crown vetch is sometimes used for maintenance-free erosion control on slopes along state and county roads. Long-tongued bees cross-pollinate the flowers, and although it is poisonous to humans and horses, cows, wild turkey, and deer use it for forage.

Golden prairie clover

Dalea aurea

Native perennial. Photographed on July 1, 2021, on a dry, gravelly hill top in the far southeast pasture. There were several plants scattered in this part of the pasture, but it is the only place here I've found them.

Golden prairie clover grows 1–2' tall on multiple erect, wand-like stems. Compound leaves have 3–9 egg-shaped leaflets. Solitary, gray-green conelike flowerheads, up to 2" long, grow at the ends of the stems, and densely-packed, 1/2" creamy yellow flowers bloom from the base to the top. Each tiny flower has fuzzy, 5–lobed calyxes at the base of an upper banner petal, two wing petals, a central keel, and a tubular stamen. The fruit is a small, silky pod. The sparse foliage and woody root system make it drought resistant.

A variety of pollinators visit golden prairie clover, and deer and cattle use it for forage. The pasture had been left fallow summer that I found it (see page 58).

Ground plum

Astragalus crassicarpis

Native perennial. Photographed May 15, 2016, on a dry southwest hill, where it is common.

Ground plum is a low-growing plant emerging from a thick taproot with many sprawling, hairy stems that form a low clump up to 3' wide. Compound leaves have 15–29 small leaflets. Clusters of 5–15 flowers grow at the ends of stems. Each lavender and creamy white flower has an erect, egg-shaped upper petal with a notch in the center, and two horizontal lower petals around a central keel. As they mature, the 1" round fruits turn purple and resemble small plums. The sweet, round pods grow near the ground and are often nestled under the plant in the grass.

It is one of the first plants to flower in late April. The raw, cooked, or pickled fruit is edible and was consumed by Plains Indians and European-American settlers, but the foliage is poisonous. The Lewis and Clark expedition collected ground plums in Missouri on June 3, 1804. Lewis described eating a ripe fruit: "...the pulp is crisp & clear and tastes very much like the hull of a garden pee."

Illinois bundleflower

Desmanthus illinoensis

Native perennial. Photographed on July, 28, 2021, along the river bank. I'd only seen it before in books about prairie plants, so I was delighted to discover it growing here.

Illinois bundleflower grows up to 5' tall on several erect stems from the base. Another name for this plant is "prairie mimosa," and it has a number of similarities to sensitive brier (*Mimosa quadrivavis*). The fern-like compound leaves of 15-30 pairs of leaflets that are sensitive to touch and sun. The spherical white flower heads are more scraggly-looking than the neat, vivid pink pom poms of sensitive brier. Each flower head has up to 50 florets, each with a 5-petaled white calyx and 5 white stamens with yellow tips. Leathery, twisted seed pods form tight bundles that turn brown later in the season. The plant is self-seeding.

Birds and mammals, including cattle, eat the nutritious seeds and foliage. Native American children used the seed pods for rattles.

Leadplant

Amorpha canescens

Native perennial shrub. Photographed June 18, 2017, on a hill in the south-central pasture, and it is scattered in the dry hills.

Leadplant grows 1–3' tall, with several stems and many branches. The roots can be up to 16' deep, making the plant able to withstand droughts and fires. The stems end in 4–6" spikes of numerous tiny lavender flowers with bright orange, protruding anthers wrapped by a broad upper petal that flattens after the flower is pollinated. Compound leaves, which can have up to 50 leaflets, are covered in dense hairs that make the plant appear grayish. The stems become more woody as they age.

The nutritious, protein-rich foliage is foraged by livestock, deer, and rabbits, and it can become scarce in overgrazed pastures. Bees and butterflies are attracted to the nectar. A pioneer name for this plant was "prairie shoestrings" because early farmers heard the strong roots snap and break when they cut through the sod and broke the roots with their plow.

Lotus milkvetch

Astragalus lotiflorus

Native perennial. Photographed on May 2, 2020, under a cedar tree on a dry, gravelly bluff on the far southeast side. This is the only example of this plant I've seen here.

Lotus milkvetch, also called "low milk-vetch," is tiny, sprawling plant that grows only 3–6" tall. Small clusters of up to 8 creamy, pink-yellowish flowers grow at the tips of short, hairy stems that emerge from the base. Each flower has an erect upper standard, two smaller lateral petals, and a small bottom keel. The petals have darker purplish streaks toward the center. The calyx, stems, undersides of the leaves, and fruits are covered in minute white hairs. Grayish-green compound leaves have 7–15 blunt-tipped leaflets, and they are generally longer than the flowering stems.

This plant is more common in short-grass prairies. According to the Minnesota Wildflowers website, this plant and other milkvetches are becoming scarce in areas where commercial agriculture, invasive species, and gravel mining are reducing prairie habitats. A variety of bee species pollinate it.

Missouri milkvetch

Astralagus missouriensis

Native perennial. Photographed on May 2, 2020, in a dry, hilly pasture on the far southeast side. It was especially abundant that particular spring.

Missouri milkvetch is a low-growing plant that is 4–6" tall and 12–18" wide, with short, thick stems and gray-green leaves extending from the base. Stems, leaves, flower stalks, calyx and fruit are all covered in sharp, stiff hairs that are attached at their centers. Compound leaves have 9–17 oval leaflets. Rose-purple flowers radiate in clusters from the tips of the flower stalks; each flower has a broad upper petal, two smaller lateral petals, a central keel, and a patch of white in the center of each petal. Oblong, greenish purple seed pods have sharp beaks at their tips and are covered in hairs.

Various species of large bees pollinate these plants, which reproduce only through seeds. M. Lewis collected Missouri milkvetch in Brule County, SD, on September 18, 1804. Cattle and wildlife may use this plant for forage.

Prairie turnip

Psoralea esculenta

Native perennial. Photographed May 27, 2017, in the southwest pasture, where it is common.

Prairie turnip grows up to 12" tall on erect, branching stems that emerge from the base. The stems and bottom of leaves are covered with long hairs. The flowers, which grow in a dense, spike-like clusters at the ends of short stalks, are surrounded by a long calyx tube and bracts with long, silvery hairs. After seeds ripen, the plant breaks off at the base, scattering seeds while it tumbles in the wind.

The thick-skinned tuberous roots of this plant, which is also called "Indian breadroot" and "prairie potato," were a valuable food source for people living on the prairie. The roots could be peeled and eaten raw or pounded and ground to make a starchy meal that was rich in vitamins and minerals. M. Lewis collected an undated specimin of this plant. On May 8, 1805, in Montana, he wrote a description of the various ways that Native Americans prepared it, noting that it is "a relatively tastless insipid food of itself tho' I have no doubt but it is a very healthy and moderately nutritious food."

Purple locoweed

Oxytropis lambertii

Native perennial. Photographed May 21, 2017, in gravelly soil on a dry north-central hill.

Purple locoweed grows up to 16" tall and 12" wide on multiple flowering stems emerging from a deep taproot. The 6" compound leaves (not visible in this image) have 9–13 oblong, stalkless leaflets covered in long, silky hairs. Leaves and multiple stems emerge from the base. Spikes of up to 25 pink-purple flowers form at the end of the stems. Each flower has a hairy, tube-shaped calyx surrounding a notched upper petal and two side petals that fold over a central keel with a small beak at the tip. The plant reproduces by seeds.

Another name for this plant is "Lambert's crazyweed." Purple locoweed can be addictive and poisonous to animals, especially horses. I've found only a few patches here--and I have no horses. I found little information about pollinators or practical uses. The feathery leaves shown in this image are cut-leaf ironplants (*Haplopappus spinulosus*),which have a yellow flower that blooms later.

Purple prairie clover

Dalea purpurea

Native perennial. Photographed on a dry south-central hill on June 3, 2015. It is scattered in the south pastures, but it is not abundant.

Purple prairie clover grows up to 3‘ tall from a taproot that can reach 6.5’ deep. Cone-like flower heads, made of many tiny purple flowers with five petals and 5 protruding yellow anthers, grow at the ends of slender, erect stems. The flowers, which form a kind of wreath around the flower head, bloom from the base to the tip. Short, compound leaves have 3–7 linear leaflets. A mature plant can produce short stalks at the base. Later, branches often fan out from the center, like a wheel.

The Lewis and Clark Expedition found this plant on September 2, 1804, in Bonne Homme County, SD or Knox County, NE. Lewis observed American Indians applying it to fresh wounds. Some tribes brewed a tea from the leaves and ate the sweet root uncooked. Purple prairie clover is a nutritious forage, but it decreases from overgrazing. Bees and butterflies are attracted to it.

Sensitive brier

Mimosa quadrivalvis

Native perennial. Photographed on June 20, 2016, along the gravel road. It is also common in open pastures.

Sensitive brier is a trailing vine with weak stems that arch and spread up to 3' among neighboring grasses and forbs. Another name for the plant is "cat's claw" because stems have curved prickles that attach to other plants. The 1" round, pompom-like flower heads have tiny fuchsia-colored tubular flowers; the most distinctive part of the flowerhead are the round yellow anthers at the tips of the stamen, which seem to sparkle. Doubly compound leaves have a prickly central stalk with 13–15 smaller stalks, each with 8–15 pairs of leaflets. Rows of tiny leaflets fold together when disturbed. The prickly, yellowish-brown fruit is long and narrow.

Although the plant produces no nectar, various bees pollinate the flowers, birds and rodents eat the seeds, and deer eat the foliage. Sensitive brier is nutritious food for livestock and can be overgrazed.

Silver-leaf scurf pea

Pediomelum argophyllum

Native perennial. Photographed July 2, 2013, in a hilly southwest pasture, where it is common.

Silver-leaf scurf pea grows up to 2' tall from an erect stem that emerges from a woody taproot. Root suckers from colonies. The upper branches grow laterally and often criss-cross each other. Large patches are formed when the plant spreads and sprouts roots. The spiked clusters of small dark blue-violet flowers are rather inconspicuous, but the plants are distinguished by their hairy, silvery-white leaves, which often seem to sparkle in the sun. The stems, bract, and calyx tubes are also thickly covered with slivery hairs. The compound leaves have 3–5 leaflets with a distinct fold in the middle.

The pastures seem to turn silvery-white in areas where silver-leaf scurf pea is widespread, but this photograph does not adequately show the silvery sheen of the leaves. M. Lewis collected this plant on October 17, 1804 in Sioux County, North Dakota. Plains Indians ate the roots raw or dried and ground them to make flour; they also used the roots to treat horses for fatigue.

Slender dalea

Dalea enneandra

Native perennial. Photographed on July 17, 2017, on the side of the dry gravelly hill along the road, which is the only place I found it until 2023, when I was excited to find five plants growing on top of a dry hill on the far southeast side.

Slender dalea is also called "nine-anther prairie clover." This spindly grows up to 4' tall from a tough, woody taproot. Erect reddish stems become branched above the middle of the plant and terminate in slender spikes of small pink-white flowers. An egg-shaped green calyx wraps around each of the flowers, which have hairy, plume-like petals and 9 stamens. Compound leaves have 3–11 narrow, rounded leaflets.

Although it is tall, this plant is delicate, and it is sometimes difficult to distinguish from the surrounding vegetation. It is a valuable plant for bees. When the county road was widened in 2021, part of the hill on which this plant was growing was removed.

Slimflower scurfpea

Psoralidium tenuiflorum

Native perennial. Photographed June 15, 2017, in the northwest hills, where it is often abundant.

Slimflower scurfpea, sometimes called “wild alfalfa," grows in a bushy shape up to 3’ tall on a hairy, many-branched stem above a deep, drought-resistant taproot. Compound gray-green leaves, made of 3 or 5 oblong leaflets, are also covered in dense white hairs. Loose racemes of 1–4 small blue–violet flowers grow along the tips of the upper branches. A hairy green calyx forms a tube around a broad, round upper petal, 2 side petals, and a center keel. Each flower becomes a small seed pod with one seed. The stem breaks off in late summer, and the plant tumbles away in the wind, spreading its seeds.

Small to medium-sized bees are the primary pollinators. The Lewis and Clark Expedition collected this plant on September 21, 1804, in Lyman County, SD. Lakota people used dried roots in a tea to treat headaches, and they also wove the stems to make a head covering for sun protection.

Trailing bean

Strophostyles helvula

Annual native vine. Photographed July 28, 2016, on the river sandbar, where I've found only a few.

This plant, also called "trailing fuzzybean," has reddish stems, up to 8' long, which sprawl along the ground or twine around other plants. Up to ten small flowers grow at the tips of stalks at leaf axils, but only one or two flower at a time. Each elegant, shell-like flower has a broad, light pink upper petal, two side petals, and a purplish, tongue-like spur that curls backwards in the center. Compound leaves have 3 egg-shaped leaflets with pointed tips. Long, green, cylindrical seed pods curl and become brown as they mature.

Trailing bean is a wild version of the common bean (*Phaseolus vulgaris*). Both the slender seed pods and the roots of this plant have been used by Native Americans as medicine and food. Bees cross-pollinate the flowers, various caterpillars, beetles, and herbivore mammals feed on the foliage, and some birds eat the seeds.

White sweet clover

Melilotus alba

Naturalized annual or biennial from Eurasia. Photographed on July, 2019, on the sandbar, where it is often abundant. In 2021, it was a dominant plant on the sandbar.

White sweet clover is similar in yellow sweet clover (*M. officinalis*), but it can grow up to 8' tall and tends to bloom a little later in the season. The plant grows from a deep, drought-resistant taproot and reseeds itself. Grayish trifolate leaves are scattered along branches. Stems end with long racemes of small, tubular, drooping white flowers. One plant may have up to 350,000 flowers.

Though a few plants have started growing in the north central pasture, I've seldom seen white clover in the south pastures, which is fortunate because it tends to be highly invasive, and its height can overpower smaller native plants. It is more common west of here. This plant is also known as "honey clover" because it is attractive to bees and is valuable for honey. Butterfly caterpillars and other insects feed on the foliage, and it is also eaten by cattle, white-tailed deer, and rabbits.

Wild Licorice

Glycyrrhiza lepidota

Native perennial. Photographed on June 21, 2013, on a dry northwest side hill. There are a number of colonies growing in the south-central hills.

Wild licorice grows 1–3' tall from deep rhizomes that often form colonies. Erect stems end in clusters of 20–50 small, creamy white flowers, each with a green, bell-shaped calyx surrounding a curving, upright upper petal, two side petals, and a central keel petal. The fruit is an oblong pod with pink to white hooked bristles that later become reddish-brown and remain on the plant through the winter. Pods resemble cockleburs but are not as sticky. Compound leaves have 11-19 small leaflets.

M. Lewis, overwintering at Fort Clatsop in 1805–06, he noted that the sweet root tasted like sweet potato. It is closely related to a cultivated European species (*G. glabra*), which was the original source for licorice flavoring. Contemporary licorice is made with artificial flavoring. The root of wild licorice has been used medicinally and for flavoring food, beverages, and tobacco.

Yellow Sweet Clover

Melilotus officinalis

Naturalized biennial from Eurasia. Photographed in the south-central pasture on June 3, 2015. It is common and often abundant in almost every pasture.

Yellow sweet clover can reaches up to 5' tall from a thick taproot. It spreads through seeds and tends to grow in colonies. It is similar in most ways to sweet white clover, except that it blooms a few weeks earlier and is somewhat smaller. Dozens of small yellow flowers grow on drooping racemes along the ends of branches. Leaves are divided into three leaflets that are widely spaced along the stems.

This plant can be found blooming as early as May, but some bloom late into the summer. In abundant years the hills turn yellow and are very fragrant. The sweet odor is due to the compound coumarin, an anticoagulant drug that is used in rodent poison, among other things. Yellow sweet clover can be invasive on disturbed areas, but, like other legumes, it adds nitrogen to the soil. Cattle, deer, and small mammals eat this clover, bees are attracted to the nectar, and other insects consume the foliage.

Great blue lobelia

Lobelia siphilitica

Native perennial. Photographed on August 27, 2021, along our river bank. I was surprised to see it when I was kayaking along the bank—it was the first example I've seen here. A number of the flowers in this image are at the end of their peak bloom.

Great blue lobelia reaches up to 4' tall on unbranched erect stems growing from a taproot. It can be clump-forming, but it is a short-lived plant. Lance-shaped leaves have small teeth along the margins. Stems end in long spikes of irregular light to deep blue-violet tubular flowers, with darker stripes along the tube. Two upper lobes curl backwards and three larger sharp-tipped lobes project outward on the bottom. Flowers bloom from bottom to top.

Another name for this plant is "blue cardinal flower," and it is closely related to the vivid red cardinal plant *(Lobelia cardinalis)*. Long-tongued bees, butterflies, and hummingbirds are attracted to the nectar. and pollen, but mammals seldom eat the plant because of the toxic alkaloids.

Small Venus' looking glass

Triodanis biflora

Native annual. Photographed June 19, 2017, in a north-central pasture. I've seen only two examples of this plant; I didn't notice this one until I nearly walked on it.

Small Venus' looking glass is an unbranched plant that grows 1–2' tall from a taproot. The .5" inch wide, solitary violet blue flowers have a tubular green calyx with 5 pointed sepals between 5 pointed, petal-like lobes, with a spreading stigma in the center. The slender stem gets longer and tends to recline as it ages. Only the upper flowers open—lower flowers remain closed and are self-pollinating. Small leaves grow at the base. The plant fades away after blooming.

Its name comes from the shiny, flat seeds that resemble mirrors. I first mis-identified this plant as Venus' looking glass (*T. perfoliata*), which has larger, clasping leaves and more flowers, but the leaves of this plant were smaller. Small bees and other insects are attracted to it.

False gromwell

Onosmodium molle

Native perennial. Photographed on May 27, 2017, in the northwest pasture. It is scattered around a number of dry areas in the hills.

False gromwell reaches up to 3' tall, with multiple upright stems growing from a deep, woody taproot. The hairy leaves, stems, occasional branches, and flowers all give the plant a grayish-green appearance. The 2–4" leaves have deep parallel ribbed veins. A drooping raceme of tubular, grayish-green flowers forms at the end of stems. Five hairy, white petals are closed at the tip and never open, and one long white style protrudes from the tip of each tube. At the end of blooming, the racemes uncoil and the flowers are replaced by 1–4 hard nutlets. The plant reseeds itself.

The nutlets are hard and shiny, thus another name for this is plant is "marbleseed." Bees cross-pollinate the plant, and other insects feed on the foliage. In late summer, the racemes look like short necklaces with hard, pearl-like seeds interspersed between the bracts.

Narrow-leaf puccoon

Lithospermum incisum

Native perennial. Photographed on May 5, 2016, in a north pasture. It is scattered in other pastures.

Narrow-leaf puccoon grows 6–16 " tall on one or more erect stems emerging from a thick, woody taproot. The stems and the long, narrow leaves are covered in fine hairs. Tubular yellow flowers, clustered at the end of stems, have 5 green, pointed sepals surrounding the spreading, petal-like lobes. These crinkly-edged flowers are mostly sterile; smaller, inconspicuous, petal-less flowers self-fertilize later in the season.

Narrow-leaf puccoons produce a stone-hard fruit after which the plant is named (*lithos* is the Greek word for stone). Native Americans had multiple medicinal and practical uses for this plant, including making blue dye. They are pollinated by various butterflies and a number of insects and grasshoppers feed on the leaves and roots. In the early spring, it is a delight to see these frilly flowers tucked among the grasses in unexpected places.

Virginia stickseed

Hackelia virginiana

Native biennial. Photographed on August 14, 2019, in the woods along the river. It can be plentiful in woody areas.

Virginia stickseed grows up to 4' tall on an erect, ridged stem with many horizontal branches. The deeply veined, lance-shaped leaves are larger and rounder toward the base of the plant. Tiny white to pale blue flowers open progressively along slender, stiff racemes at the tips of the branches and upper leaf axils. Each 1/8" flower has 5 rounded petals, and it droops downward from a short stalk. Flowers develop into 4-part brown nutlets covered in hooked prickles. The plant reseeds itself.

Another name for this plant is "sticktight," and I've discovered the truth in that name returning home after a walk in the woods with dozens of seeds stuck to my pants and jacket. I am luckier than the cows, however, who often have long necklaces of stickseeds hanging on their backs and faces, with few ways to remove them.

Climbing buckwheat

Polygonum convolvulus

Naturalized annual from Eurasia. Photographed winding among the grasses in a northwest pasture on September 6, 2019, and it is also found along the edges of woody areas.

Climbing buckwheat is a trailing, branching vine with multiple stems that grow from a taproot, spreading up to 8' along the ground and twining itself clockwise around neighboring plants. The widely-spaced, simple leaves are heart-shaped and rather delicate on their long leaf stems. Insignificant greenish-white flowers, which grow in short, loose racemes at the ends of stems and leaf axils, turn into 3-sided fruit with black seeds. This weedy plant reseeds itself.

This plant is also called "black bindweed," but it is not in the same family (*Convolvulaceae*) as real bindweeds. Birds and rodents eat the seeds. A weedy vine, it can damage supporting plants. In this image, I digitally removed the ground and most background plants before layering it on a sky photo, and it looks like it is floating. Wasps and bees collect the nectar, and some insects feed on the foliage.

Curly dock

Rumex crispus

Naturalized perennial from Eurasia. Photographed on June 17, 2019, along the gravel county road. It is common on disturbed ground in low areas.

Curly dock is a weedy plant that grows up to 4' tall on an erect flower stalk emerging from a large, fleshy taproot. Unlike the similar pale dock (*R. altissimus*), curly dock has dull, crinkled leaves that are largest at the base of the plant. Small, greenish flowers, with sepals but not petals, grow in spiked clusters. The stems and fruit become reddish brown as they mature—they are similar in color and shape to those seen on pale dock. Plants are cross–pollinated and spread by wind.

Various insect larvae and butterflies consume the leaves, stem, roots, and seeds, and a number of birds eat the seeds. The nutritious dried seeds and young leaves are used in diverse ways in cooking, and roots have been used in homeopathic medicines. Tall brown spikes of curly dock are a familiar sight in ditches along many country roads later in the summer.

Lady's thumb

Polygonum persicaria

Naturalized annual from Europe. Photographed on June 26, 2017, on the sandbar, and they are also found in lowland wet areas in the pastures, often in large colonies.

Lady's thumb grows up to 2' tall on erect jointed stems that terminate in a few erect, cylindrical spikes of densely-packed flowers. The small flowers, which are in various shades of pink, are comprised of 5 fused sepals and 6 stamen, with no petals. They often look like small beads. The upper surface of the lance-shaped leaves often have a dark purplish smudge, and a hairy sheaf wraps around the stem at the stalk of each leaf. It has a shallow root system and can form colonies in wetlands.

The dark smudge on the leaves were thought to look like the Virgin Mary's thumbprint. The nectar of the fragrant lady's-thumb flowers attract various bees and other insects, and larvae and grasshoppers feed on the foliage. The plant is an important food source for waterfowl and songbirds. The seeds and young plants have culinary uses, and it has been used to make yellow dye.

Pale dock

Rumex altissimus

Native perennial. Photographed on July 22, 2016, in a moist, gravelly south-central meadow, where it is often plentiful. It also grows along the road and in other wet lowland areas.

Pale dock grows over 3' tall on an erect, sometimes branching stem that arises from a basal rosette above a deep, branching taproot. Small, green 1/8" flowers are densely clustered at the top of the plant. Though green early in the season, the fruits later turn brown and develop hard, dark seeds. Pale dock is similar to the more common curly dock (*Rumex crispus*), but its long, narrow leaves are mostly smooth and often shiny. The flowers are cross-pollinated and spread by both wind and water.

Pale dock seeds are consumed by birds, and various insects and caterpillars eat the leaves, stems, and seeds. The plant is not palatable for most mammals. Lakota people made medicinal teas and poultices with the leaves.

Pale smartweed

Polygonum lapathifolium

Naturalized perennial from Eurasia. Photographed on August 15, 2020, on the sandbar. It is less common here than some of the other smartweeds.

Pale smartweed grows up to 4' tall from shallow, fibrous roots. The erect reddish stems may have some branching. Arching, lance-shaped leaves, up to 6" long, are enclosed at their base by a sheath that wraps around the stem and peels off over time. .Densely clustered, cylindrical racemes of greenish white flowers at the ends of stems droop downward in graceful arches. The flowers, which look like grains of plump rice, have 5 tepals that do not fully open. The plant spreads by reseeding itself.

Bees, wasps, and small butterflies feed on the nectar, and a number of insects eat the foliage. Wetland birds also use the plants as a food source. Plains Indians cooked young shoots of the plant or ate them raw.

Pennsylvania smartweed

Persicaria pensylvanicum

Naturalized annual from Eurasia. Photographed on August 9, 2017, at the edge of the sandbar.

White smartweed grows up to 3' tall from a taproot. Upright or sprawling stems are light green to red. Stems end and brnches in .75–2.5" cylindrical racemes with closely-packed greenish-white to pink flowers. The narrow tapered leaves are up to 6.5" long and don't usually have the darkish spot found on lady's-thumb. Similar to the lady's thumb, however, the sepals are fused into a cup and barely open. A brown sheath surrounds the base of each branch.

Depending on where it is growing, this smartweed can be highly variable in appearance. It is a valuable food source for waterfowl, insects, and small mammals. The Lakota cooked seeds in soups or ground them into flower. The plant has a high nitrogen content and has been grown and plowed under to fertilize poor soil.

Alkali buttercup

Ranunculus cymbalaria

Native perennial. Photographed on May 28, 2019, cascading down the muddy side of a northwest creek during the wet spring of 2019. Over the rainy summer it became a fast-spreading presence in the flooded meadow. It is scarce in dry years, however.

Alkali buttercup grows up to 6" tall from a bulb and spreads with stolons that take root in the mud and form colonies. The rounded, shallowly toothed leaves are variable in shape and larger toward the base. Small, 1/3" wide flowers have 5 yellow petals, 5 yellowish sepals, and a ring of yellow stamens radiating around a green center. As it matures, the center elongates into a .5" long cylindrical seed head.

This plant is also called "shore buttercup." The flowers attract a variety of bees, flies, and insects, and the foliage is a food sources for a number of insects. Although the flowers are poisonous for mammals, some consume the seeds. Exposure to the sap can cause skin irritation.

Candle anemone

Anemone cylindrica

Native perennial. Photographed on June 13, 2018, on a dry hill in a northwest pasture. I was surprised to find this solitary plant standing alone among tall grasses. I had never seen it before, but in subsequent years I have found many of them scattered in other pastures.

Candle anemone grows 1–2' tall from a taproot and slender rhizomes. Long flower stalks emerge from a whorl of deeply-lobed, 3–5 part compound leaves at the base, with a smaller whorl of leaves at the midpoint of the stem. Each flower stalk has a single cup-shaped flower with 5 greenish white sepals, and numerous yellow-tipped stamen surround a gray-green center cone. After the flower blooms, the center elongates into a long cylinder with brown seeds that become cottony tufts.

This plant is also called "thimbleweed" because the center of the flower resembles a thimble. The pollen attracts small bees and flies, but mammals avoid it because the foliage contains toxic alkaloids. Lakota people made poultices out of the roots to treat wounds and burns.

Celery-leaved crowfoot

Ranunculus sceleratus

Native annual. Photographed on October 22, 2017, at the edge of the dammed pond in the south-central pasture. This plant normally blooms earlier in the summer, but I found these flowers during an unusually warm October. Since then, I've found them in other wet areas.

Celery-leaved crowfoot grows up to 24" tall from a fibrous root system that thrives in water or wet soil. The hollow stems have many branches, and the upper stems and leaf axils end with small flowers with 5 round yellow petals above 5 yellow-green sepals, and a ring of yellow-tipped stamen around a green central cone. This cone elongates into a cylindrical seed head. Fleshy leaves, which are 3" at the base and smaller toward the top of the plant, are deeply lobed or divided into 3 leaflets.

This plant is also called "cursed crowfoot" because toxins in the stem and crushed leaves can cause skin sores and blisters. Short-tongued bees, flies, and beetles are attracted to the pollen and nectar, and beetles and aphids feed on the foliage.

Meadow anemone

Anemone canadensis

Native perennial. Photographed on June 1, 2017, in the partly shady, wooded bottomland along the river, where it grows in large colonies. I have not found it growing in other woody areas.

Meadow anemone has wedge-shaped, deeply–lobed, pointed leaves at the base, above an extensive system of rhizomes. There is a whorl of similarly-shaped green leaves at the top of the stem, and long flower stalks grow from the whorl. Flowers have 5 petal–like, notched white sepals surrounding a green center of pistils ringed with numerous yellow-tipped stamen. The upward-facing flowers follow the sun in the daytime and close at night.

Meadow anemone is abundant in the river woods, where colonies look like a white carpet when they are blooming. Bbees collect pollen and insects eat the foliage and roots. The roots have are an astringent quality that was used in Lakota medicine. A common plant along rivers, it is thought that M.Lewis collected it in what is now Dakota County, Nebraska, on August 17, 1804.

Meadow Rue

Thalictrum daycarpum

Native perennial. Photographed on June 20, 2020, nestled among trees in the woods along the river. It is scattered in this woods, but it is not abundant.

Meadow rue is a lacy plant that often grows in clumps up to 8' tall on hollow, purplish stems above rhizomes that form colonies. The blue-green compound leaves resemble those of wild columbine (*Ranunculus abortivu*s). Loose clusters of white flowers spray out at the ends of stems and leaf axils toward the top of the plant. Each flower is 1/3" across, with 4–6 greenish white sepals. Male and female flowers grow on separate plants. Female plants have 10 thread-like pistils, and male plants have 12 drooping stamen with yellow-tips.

Omaha and Ponca children have used the hollow stems as flutes, and the plant has various medicinal and practical uses. Although some pollinators are attracted to the pollen in male flowers, the plants are cross-pollinated by the wind.

Prairie larkspur

Delphinium virescens

Native perennial. Photographed on June 17, 2019, on a southwest side hill. I was surprised to find this plant growing by itself among other plants in the southwest pasture, and I was lucky that I had my camera with me. I've seen a few more examples, but it is not common here.

Prairie larkspur is a narrow plant that grows 1–3' tall on an erect, seldom branching, purplish stem emerging from thick fibrous roots. The compound leaves, which grow on 3" long stalks at the base and become smaller above, are divided into three parts, each of which is further divided with narrow lobes. A loose raceme of overlapping, lavendar-tinged white flowers growing at the top half of the central stem have upper sepals that turn into an upwardly curved spur and a smaller, cup-shaped lower petal. A round cluster of green pistils in the center elongate as the plant matures.

The plant reproduces by seeds. Bumblebees cross-pollinate the plant and night-flying moths are attracted to the nectar, but mammals avoid the toxic sap.

Small-flowered crowfoot

Ranunculus abortivus

Native biennial. Photographed on May 14, 2018, in the moist, shady woods along the river, where it is often common. I haven't seen it in other woody areas.

Small-flowered crowfoot grows up to 2‘ tall on multiple stems emerging from fibrous roots. Leaves at the base are heart or kidney shaped with scalloped edges, middle stem leaves are divided into 3–5 rounded parts, and leaves at the very top are long and narrow. Upper stems terminate in 1–3 stalked flowers with 5 triangular yellow petals alrenating between 5 round green sepals. Multiple stamens with yellow-tipped anthers surround a bulbous cluster of green carpels that later become small seeds.

This early spring plant is spread through seeds. The leaves are somewhat toxic, but ground foraging birds and small mammals, such as rabbits, are attracted to the seeds or foliage, and some flies and bees collect the pollen. This plant is named for the small size of the petals.

Virgin's bower

Clematis virginiana

Native perennial vine. Photographed on November 2, 2018, along the riverbank. I've seen it covering a few trees in a woody draw in the southwest pasture, but it is not common.

Virgin's bower grows 6–20' long from a deep, fibrous root system. Young stems are hairy and often reddish, and older stems become woody. Compound leaves have three leaflets. Leaf stalks grow along the ground or wrap around other plants and structures; in this case, the vine was supported by a gooseberry shrub that had shed its leaves. Male and female flowers may grow on separate plants. Branching clusters of small white flowers bloom in summer, but this plant is most distinctive later in the fall when the female flowers form clusters of seeds with wispy, grayish-white, 2" long plumes that eventually turn brown, but which may remain present much of the winter. The vine reseeds itself.

The flowers are a good pollinator for some bees and butterflies, and a variety of larvae feed on the foliage. It also serves as a good cover habitat for songbirds.

Wild columbine

Aquillegia canadensis

Native perennial. Photographed on May 5, 2016, along a moist, shady slope in the woods near the river. It is abundant in this one area, but I haven't found it growing in other woody places.

Wild columbine grows 2–3' tall from a stout caudex above shallow roots. The greenish-red stems are slender and branching, and they end in drooping clusters of bell-shaped, upside-down flowers. The 2" long flowers have a column of 5 yellow petals that are round at the tips and surrounded by 5 outward flaring, scarlet red sepals. The top (actually the base) of each flower is crowned with a hollow red spur containing nectar, and a bushy cluster of yellow stamens projects from the center.

Although it looks very delicate, wild columbine is a persistent plant that is spread by seeds and can form large colonies. Long-tongued bees and the ruby-throated hummingbird are able to feed on nectar in the deep spur of the flower. Another name for this is "American columbine." It is a well-loved plant that was exported to European gardens as early as the 1600s.

Prickly pear cactus

Opuntia macrorhiza

Native perennial succulent. Photographed June 20, 2017, on a dry south-central hill. They are fairly common on dry hills, but as they are often hidden in taller grasses, flowers are difficult to see.

Prickly pear cactus grows up to 10" tall from thick fibrous roots. It is reproduced by seeds and dull green, rooting pads that often form large clumps. The flattened, egg-shaped pads are modified stems, and the barbed spines, which grow in clusters on the pads, are modified leaves. The solitary flowers, growing from cone-shaped, jointed upper stems on the central pad, have 7 or more yellow petals and numerous yellow-tipped stamen surrounding a protruding green ovary in the center.

The spines sometimes penetrated moccasins of early European-American explorers; M. Lewis complained: "The prickly pear is now in full blume and forms one of the beauties as well as the greatest pests of the plains." It has many benefits, however: humans and wildlife eat the fruit and pads, and the interior flesh of the pads is used to heal burns.

Fragrant sumac

Rhus aromatica

Native shrub. Photographed on April 21, 2017, in the north pasture, and it is common in the hills.

Fragrant sumac is a sprawling plant that reaches up to 6-12' tall and 10' wide, with root suckers that create dense thickets. Lower branches often grow horizontally and turn up at the tips. Small clusters of yellow flowers appear at the end of branches before the leaves appear.

When crushed, fragrant sumac leaves smell somewhat like turpentine. Lewis and Clark collected this plant on October 1, 1804 in Jefferson County, South Dakota, and sent a specimen back to President Jefferson the following spring. Butterflies and birds are attracted to this shrub, and the berries are an important winter food source. Native Americans have used the tannin-rich leaves for medicine, and flexible green shoots were used for basket-making. This plant is closely related to skunkbrush sumac (*R. trilobata*), but the leaves are duller and less lobed. I compared the two kinds of leaves in nearby shrubs growing in the pasture, but identification is still very confusing.

Skunkbrush sumac

Rhus trilobata

Native shrub. Photographed on May 15, 2017, in a north-central pasture.

Skunkbrush sumac grows up to 3' tall and 8 ' wide and spreads through rhizomes, often forming thickets. The shiny compound leaves have 3 leaflets that are more deeply lobed than those of the fragrant sumac (*R. aromatica*). Clusters of tiny yellow flowers bloom before the leaves appear. New twigs are fuzzy, but they become smooth as they mature. As in the fragrant sumac, flowers and berries are produced only on female plants.

The leaves have a disagreeable odor when they are crushed. The berries are a valuable food source for birds and small mammals. The bark, berries, and leaves have been used medicinally, and Plains Indians used branches to make baskets. It is very smilar to fragant sumac; some references, such as the Lady Bird Johnson Wildflower Center, make a distinction between the two plants, but other sources group them together, and their common names are sometimes interchangeable.

Smooth Sumac

Rhus glabra

Native shrub. Photographed on Oct. 2, 2009, in the south-central hills. It is abundant and spreading in many places in the open hills and draws. Unfortunately, controlled fires do not limit its spread.

Smooth sumac grows up to 15' tall with much branching, and it spreads through a root suckers. Compound leaves have 11–29 serrated leaflets. Pyramid-like panicles of yellow-greenish flowers blossom at the ends of the upper branches in May; male and female flowers are on seperate plants. Later in the season, clusters of hairy, round fruits on female plants turn reddish brown, and the leaves turn shades of bright or deep red.

Although it's beutiful in the fall. itis spreading ithroughout the pastures and can dominate grasses and But it is an important food source for wildlife and serves as a cover. Bees are attracted to pollen, and birds and small mammals eat the seeds. The fruit can be crushed in water to make a lemonade-like drink, and tannins in the leaves, twigs, and roots are used in dye.

Common cattail

Typha latifolia

Native grass-like perennial. Photographed on August 24, 2017, in a creek on the southeast side. It also grows in other wet draws and creeks.

Common cattail is a wetland plant that grows up to 10' tall on erect stems above underground rhizomes that send up shoots to form dense colonies in shallow water. Two cylinders of closely packed flowers—the top yellow one is male, and the bottom green is female—form at the ends of stems. The plant is cross-pollinated by the wind. Male flowers wither and fall off after blooming, leaving a bare stalk tip. Female flowers turn brown and become a spike covered in fluffy down. Female flower heads have been compared to cigars. There can be up to 200,000 hairy seeds in a single flower head.

Birds and small mammals use cattail colonies for cover and nesting, and caterpillars feed on the leaves. Various parts of the plant, including rhizomes, flower spikes, shoots, and seeds, have been used for food, medicine, and even diapers. The plant can absorb dangerous pollutants in the water.

Redwhiskered clammyweed

Polanisia dodecandra

Native annual. Photographed on August 9, 2017, in gravelly soil on a north-central bluff. I've also found colonies on bare sandbars in the river, but the when the water is higher, the sandbar and plants disappear under water. I've also found it on a steep dry bluff on the far southeast side.

Clammy-weed grows up to 2' tall on an erect, branching stem emerging from a taproot. Clusters of flowers with 4 white, notched petals grow at the ends of purplish stems. Multiple green-purple stamens project slightly beyond the petals. Compound leaves near the base and simple leaves higher on the plant are covered in short hairs. Fertilized flowers become tapering cylindrical seed pods. It self-seeds.

This plant is called "clammy" because the sticky glandular hairs covering the plant have a strong odor. M. Lewis collected clammyweed this near the Vermillion River in South Dakota on August 25, 1804.

Clove currant

Ribes odoratum

Native shrub. Photographed on April 20, 2015, in a shrub thicket on a northwest hill. There are a some scattered in other shrub thickets, but it is not common.

Clove currant is an irregularly-shaped, loosely-branched plant that grows 6–8' tall and spreads by root suckers. The rough, rounded leaves have 3–5 lobes. Clusters of 5–10 trumpet-shaped flowers, growing from leaf axils along branches, have 5 bright yellow, rounded sepals surrounding 5 smaller, erect, yellow petals that turn orange or red over time. There is a yellow-green floral tube at the base.

This is a delightfully fragrant and attractive shrub in early spring, with a strong, pleasant aroma that is similar to cloves. The mature orange to black berries can be eaten raw or used in jams, juices, and baked goods. It actually may be a golden currant (*R. aureum*), which was collected and used as a food source by the Lewis and Clark Expedition in Montana in July, 1805. Lewis noted that he particularly liked the fruits, "...which I think vastly preferable to those of our gardens."

Wild gooseberry

Ribes missouriense

Native shrub. Photographed on April 29, 2017, at the edge of the northeast pasture. They are especially abundant in the woods near the river.

Wild gooseberry is an early bloomer that can grow 5' tall, with dense, branching stems growing from woody, spreading roots. Clusters of 2–4 slender, pale yellow or greenish-white, trumpet-shaped flowers dangle from upright or arching branches. The 2" round leaves, which have 3–5 lobes and blunt teeth along the margins, turn reddish-purple in the fall.

This is a very prickly plant. Larger branches are covered with small, 1/4" thorns, and bunches of 1–3 long thorns stick out at branch nodes, often making it difficult to walk through thickets in the woods. The tart round berries, which turn from green to dark purple, can be eaten raw or cooked, and used in pies. Flowers attract long tongued butterflies and bees, and birds and small mammals eat the berries.

Hemp dogbane

Apocynum cannabium

Native perennial. Photographed on June 26, 2017, at the edge of the sandbar. I've also seen it in shallow, wet draws in the hills and in ditches along the gravel county road.

Hemp dogbane grows up to 5' tall on erect, waxy, purplish-red stems. It spreads by rhizomes and seeds to form dense colonies. Smooth, lance-shaped leaves are lighter on the lower side. The top of the plant and upper branches end in clusters of small, bell-shaped, greenish-white flowers with petals that are fused at the base and flared outward. All parts of the plant contain a milky white juice. Flowers are replaced with pairs of long, slender, dangling seed pods.

This plant is an important source of nectar for butterflies and other pollinators, and insects feed on the foliage. American Indians peeled the bark off stems and used the fibers for cordage and threads to make woven goods. Although it has been used externally and as a weak tea for medicine, hemp dogbane is poisonous—all parts of the plant can cause heart arrest, and the sap causes blisters.

Rough-leaved dogwood

Cornus drummondii

Native perennial shrub. Photographed on August 10, 2014, along the gravel road. It is also scattered in a few shrub thickets in the hills.

Rough-leaved dogwood grows up to 15' tall and wide and spreads by runners that send up new shoots that create multiple scaly, gray trunks. Rough, pointed leaves have whitish-green veins curving toward the margins. Flat clumps of 4-petalled, creamy white flowers bloom at the ends of the stems in June. Shown here are the hard, creamy white, one-seeded drupes that develop in August.

This flowering shrub is beautiful and fragrant in the spring, but I am most drawn to the brilliant red branchlets and spherical white drupes that appear later in the summer. A variety of bees and other insects are attracted to the nectar and pollen, and many invertebrates feed on the foliage. It also serves as cover for wildlife, songbirds eat the nutritious fruit, and deer eat the fruit and foliage. It produces a hard wood used by American Indians for arrow shafts.

Common evening primrose

Oenothera biennis

Native biennial. Photographed on July 28th, 2016, on the sandbar, where it is often abundant.

In the first year, common evening primrose forms a basal rosette of lance-like leaves. In the second year, an erect, reddish-green stem grows up to 5' tall from a deep, fleshy taproot. A spike-like panicle of 1" wide flowers grows at the end of the stems. Each flower has a long green calyx, 4 pale, cup-shaped yellow petals, and multiple yellow stamens in the center. Narrow seed pods split open to release many tiny seeds.

Only a few flowers bloom at a time. They open in the evening and close in the morning—never to open again. A lemony scent attracts butterflies and bees early in the morning, and night-flying moths pollinate them in the evening. It is a nutritious food source for birds and mammals. All parts of the plant have multiple uses. The bark has been used to make string, the root is edible when cooked, and leaves can be used in salads. Evening primrose oil is sold online as a remedy for many medical issues.

Scarlet gaura

Gaura coccinea

Native perennial. Photographed on May 15, 2017, on a south-central hill. Small colonies grow in a few other areas in the pastures, and they became abundant on a dry hilltop on the southwest side.

Scarlet gaura grows up to 18" tall on an erect stem, with rhizomes and seeds that often form colonies. Small, narrow leaves alternate along the central stem and side branches, which are covered in small white hairs. Delicate, drooping flowers bloom from the bottom of a spike to the top. Over the course of one day and night, the flowers change from white to pink to scarlet—and then wither. A light green, tubular calyx surrounds 4 paddle-shaped, spreading petals, 8 white stamen with red tips that fan outward, and a 4-lobed style.

This small plant, which is also called "scarlet beeblossom," has a sweet fragrance at night that attracts nocturnal moths. Grasshoppers and caterpillars are among the insects that feed on this plant.

Velvety gaura

Gaura parviflora

Native annual or biennial. Photographed on June 25, 2017, on a northwest hill. They are loosely scattered in other pastures.

Velvety gaura grows on an erect stem up to 6' tall from a stout taproot. The soft, light-green, lance-shaped leaves and reddish-green stems have fine hairs that give the plant a velvety appearance and text. The stems end in a long, drooping spike with small intricate flowers that bloom from bottom to top over time. Buds look like little reddish-green knobs. The spike can be up to 2' long. Individual flowers tubes have 4 spreading, spoon-shaped pink-red petals, 4 narrow, drooping sepals, and 8 radiating stamen, which are fused at the bottom. Flowers bloom in the evening and close in the morning.

This plant, which is also called "lizard-tail gaura," can become weedy on disturbed ground. Flowers are cross-pollinated by bees and moths. When the stem develops multiple long, flaring branches toward the top of the plant, it can look like a scarecrow waving its arms in the air.

Common mullein

Verbascum thapsus

Naturalized biennial from Eurasia. Photographed on July 9, 2016, in a disturbed meadow on the southeast side, and it is scattered in other areas on the south side.

In year one, common mullein is a 1–2' wide, fuzzy rosette with large, cupping leaves. In year two, it grows up to 7' tall on an erect, pole-like stem that emerges from a deep, stout taproot. Stem and alternating oval leaves are covered in dense white hairs that give the plant a silvery, downy appearance. The base of upper leaves grow beyond the stem, making small, wavy collars. A dense spike at the top of the plant is made of multiple 1" wide flowers that open a few at a time and for only part of the day. A calyx with 5 sepals surrounds 5 rounded pale yellow petals and 5 stamen. Dry stalks with brown seed heads may remain standing through the winter. Tiny seeds are spread by wind.

All parts of the plant are edible, and European and American Indian cultures used it as an astringent and expectorant, toilet paper, and tea. Bumblebees pollinate the flowers.

Foxglove beardtongue

Penstemon digitalis

Native perennial. Photographed on May 24, 2017, on a southeast hill. I think it is the only example I've seen here. This plant is in the 2nd tier of at-risk Nebraska plants.

Foxglove beardtongue grows up to 3' tall on an erect green-maroon stem that arises from short rhizomes. White to pale pink flowers grow in panicles from the end of the stem and small upper leaf axils. The flower panicle is about 1/3 the height of the whole plant, and shiny, long, lance-shaped leaves grow opposite each other on the lower part. There are 3–6 pairs of tubular flowers, with a 5-lobed green to pink calyx surrounding 2 flaring upper lobes and three lower. Purplish bee lines are often found on the bottom lobes. Four black-tipped stamen are curled inside the flower, and a longer stamen extends beyond the opening, like a tongue.

Like other penstemons, these long, trumpet-like flowers attract long-tongued bees. Some caterpillars feed on themt, but the foliage is not generally attractive to birds or mammals.

Rough purple gerardia

Agalinis aspera

Native annual. Photographed on September 7, 2019, when I unexpectedly found a few plants among tall grass at the bottom of a hill in the northwest pasture.

Rough purple gerardia grows 1–2' tall on an erect stem. Lightly-haired, purple-pink tubular flowers grow on stalks at leaf axils along the stem and side branches. Each flower has a green calyx tube at the base of the 5-lobed, spreading corolla. Four stamen peek out of the pink-white throat of the flower, which is dotted with small purple specks and two yellow lines.

The roots of rough purple gerardia are partially parasitic and may obtain water and nutrition from neighboring plants. Various bees pollinate it, and it spreads with numerous tiny seeds distributed by the wind. It tends not to grow in colonies. The place I found it subsequently became a wetland that is overgrown with slough grass (*Beckmannia syzigachne*), and I've never seen the gerardia again.

Shell-leaf penstemon

Penstemon grandifloris

Native short-lived perennial. Photographed on June 4, 2014, on a dry hill on the southeast side. It is scattered in a few other sunny areas in the hills, especially after the 2021 burn.

Shell-leaf penstemon has erect whitish-green to reddish stems that grow 2–4' tall from a woody caudex above a thick taproot. It is a drought-tolerant plant that is aided by the waxy coating on the stems and leaves that protect the plant from summer heat. Large, 2" pinkish-lavender flowers flare into a somewhat flattened trumpet-like shape. Sets of up to 6 flowers on short stalks are whorled around the stem at the axils of two leafy bracts. Each flower has a light green calyx below a 2-lobed upper lip, a 3-lobed lower lip, and a white projecting style with a broad yellow tip.

Purple lines in the flower throat function as nectar guides for hummingbirds and long-tongued bees. Shell-leaf penstemon is spread by seeds. Lakota people used the leaves for fever and the roots for chest pain. In this image, I moved three separate plants slightly closer to each other.

Slender beardtongue

Penstemon gracilis

Native perennial. Photographed on June 12, 2020, on a dry hilltop on the far southeast side. I had never seen it before, and I almost missed it this time because it was shorter than the surrounding grasses. As in the other plant portraits, I've digitally removed most of the taller grasses.

Slender beardtongue is a delicate plant that grows up to 2' tall on erect, non-branching stems. Slender, pointed leaves have tiny teeth along the margins. Two or more 3/4" long, pale purple flowers grow on stalks at upper leaf axils. These finely-haired tubular flowers have three larger bottom lobes that turn down, and two smaller lobes at the top that curve backwards. The lobes have darker purple stripes and are white at the center of the tube. Five yellow-tipped stamen and a fuzzy orange-yellow flap project from the center.

This drought-resistant plant attracts long-tongued pollinators, including bumblebees and hummingbirds. It became abundant in the spring after the 2022 drought.

White beardtongue

Penstemon albidus

Native perennial. Photographed on June 17, 2013, in sandy soil on a hillside in the far southeast pasture. There was a large colony the year I took the photo, but I've seldom seen it since then.

White beardtongue grows 6–20" tall on 2-5 stout stems that emerge from the base. Stalked leaves have variable sizes and shapes, and tend to be lance-shaped toward the top. White to pale pink, tubular flowers have an upper lip with two lobes and a lower lip with three. Reddish-purple lines in the throat of the flower lead insects to the pollen. The flowers, sepals, upper stem, and stem leaves are covered in tiny hairs. Fruit capsules are egg-shaped.

This plant attracts butterflies and other long-tongued pollinators, like the bumblebee on the right. In this portrait, sandy soil covers the bottom surfaces of the plant.

Grooved yellow flax

Linum sulcatum

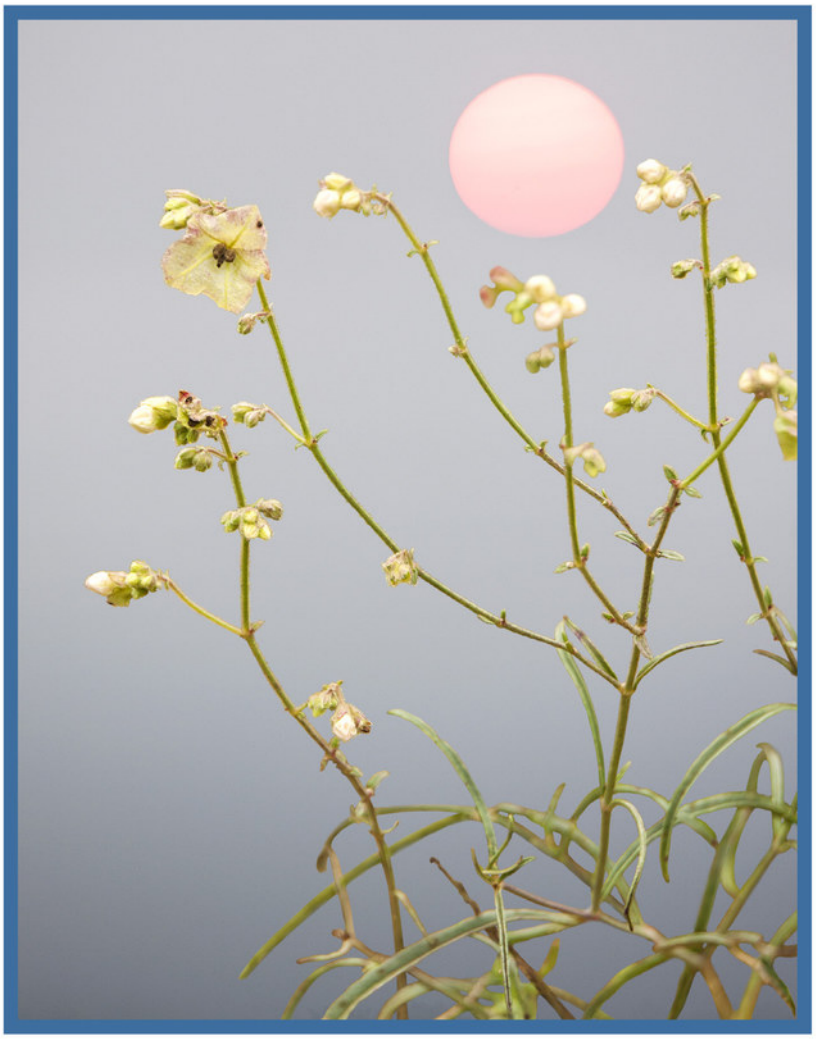
Native annual. Photographed on June 3, 2017, on a dry southeast hill, where it was scattered but not abundant.

Grooved yellow flax is a dainty plant that grows up to 2' tall from a slender taproot. Upper stems have loose, branching clusters of yellow flowers, but only a few bloom each day. They shed their petals by noon, and a new set blooms the next morning. The slightly tubular flower has 5 oval, spreading, veined petals; 5 yellow stamen; and a 5-part style clustered in the center. The flowers are about 1/2" long and wide. Linear upper leaves alternate along the stem, and leaves at the base of the plant wither by the time the flowers bloom. Glandular brown spots appear at the base of leaves.

The plant spreads through reseeding. Pollen and nectar attract bumblebees and a few other insects, but toxic compounds deter mammals from eating it. The seeds contain cyanide, which can be destroyed by roasting. Flax fiber has been used to make cordage.

Narrow-leaf umbrella-wort

Mirabilis linearis



Native perennial. Photographed on August 21, 2017, on a dry northeast hill. I initially thought it was a solitary plant, but after the controlled burns, I've found more scattered around the south hills.

Narrow-leaf umbrella wort is a sprawling plant that grows up to 2.5 feet tall and 3 feet wide, often in clumps. The bracts, buds, narrow folded leaves, and stems are covered in fine hairs. Clusters of 2–4 flaring pink or white flowers are surrounded by hairy bracts at the ends of stems and upper leaf axils. There are five fused, deeply notched, petal-like sepals that surround multiple yellow-tipped pink stamens radiating from the center. This image shows a later stage of the plant, when the bract has swollen into a flat, papery, hairy disk with a 5-angled fruit containing yellow-brown seeds.

The flowers, which bloom a few at a time, open in the evening and are spent by morning. There is a ghost-like quality to this papery flower. It took me several years to identify this plant because I seldom found it blooming. Lakota people used a tea made of dried leaves to induce urination.

Wild four-o'clock

Mirabilis nyctaginea

Native perennial. Photographed along the road on June 18, 2017. After the prescribed burn in 2018, I have found many more growing in the southwest hills along the edges of woody draws.

Wild four-o'clock has slender erect or angling stems that grow to 4' tall from a fleshy taproot. Clusters of up to 5 bell-shaped flowers grow at the leaf axils. Larger oval or heart-shaped leaves grow on the bottom 2/3 of the plant, below the forking branches. The delicate pink to magenta flowers open in the late afternoon and wilt in the morning. Each flower has a 5-lobed bract surrounding 5 fused, notched, flaring pink sepals and yellow–tipped stamens, with a pink style project from the center. The sepals drop off after a few hours, and later the bract expands and develops fruit.

Bees are attracted to the nectar and pollen, and moths and caterpillars eat the foliage. American Indians used teas and poultices for medicine. Tropical bougainvillea plants are in the wild four-o'clock family. Lewis and Clark collected this plant on September 1, 1804, in Bonne Homme County, SD.

Slender fumewort

Corydalis micrantha

Native winter annual. Photographed on May 16, 2018, at the base of a rotting tree trunk in the river woods. I unexpectedly found this solitary plant when I was searching for morel mushrooms, and I assumed it was a fragile woodland plant. In 2022, however, I found them along the county road.

Slender fumewort grows on upright or sprawling stems up to 12" tall from a slender taproot. Flower stalks emerge from a rosette of leaves at the base. Tubular yellow flowers at the ends of stalks grow upright at first, but they become horizontal as the plant matures. Each flower has 2 visible yellow outer petals and 2 less-visible white inner petals that broaden into ruffled lips. The upper yellow petal is fringed in front and forms a rounded spur in the back that serves as a landing pad for insects. The lower petal is also ruffled and extends downward. Compound leaves at the base and along the stem are deeply lobed and feather-like. The plant spreads by seeds in pod-like capsules.

Insects, especially long-tongued bees, visit this early spring plant. Mammals avoid the toxic foliage.

Riverbank grape

Vitis riparia

Native perennial vine. Photographed on May 21, 2017, on a downed tree truck hanging horizontally over the Missouri River. It is common in other wooded areas.

Riverbank grape is a climbing, branching vine that grows up to 75' long. Clusters of flowers with 5 green to yellow petals grow opposite the leaves on new branches. By late July, the flower clusters produce grapes with a powdery white coating. Newer branches are green to reddish, and in mature vines, the brown bark becomes loose and ropy, often peeling away in strips. Hairy, heart-shaped leaves are deeply lobed in 3 parts and have sharply toothed edges.

River-bank grape is a valuable food source for many insects and birds. Culinary uses for this plant include wine-making, stuffed grape leaves, and grape-seed extract, which is used medicinally as an anti-oxidant. Native Americans used the fruit raw, cooked, or dried. It is related to Virgina creeper and woodbine, which I've also seen in the woods.

Common hops

Humulus lupulus

Native perennial vine. Photographed on September 5, 2019, when I unexpecteedly encountered it in a woody draw on the south-east side. I have not seen it again.

Common hops is a woodland plant that spreads through rhizomes, climbing stems, andwind-blown-seeds. Vine stems can reach 25' long. Male and female flowers, which occur on different plants, bloom at the leaf axils and branch tips. Clusters of 10–50 fragrant female flowers have small green bracts behind long, thread-like styles. Male flowers have 5 cream-colored, spreading sepals and 5 stamens. Compound leaves of varying sizes have 3–5 sharp-tipped lobes and rough teeth along the margins. Female flowers become seed cones that turn straw-colored and then brown.

It has been used for food and medicinally in a variety of American Indian and European cultures. Young plants can be cooked and eaten, and the female flowers are cultivated and dried for flavoring and preserving beer. Lakota people boiled the hops and mixed the liquid with flour to make bread.

Marijuana

Cannabis sativa

Naturalized annual from Asia. Photographed on August 24, 2017, in a southeast pasture. Cattle do not eat this plant, so it can become invasive on disturbed ground.

The plant, also called "hemp," grows over 12' tall on an erect stem with many branches. Fan-shaped, compound leaves have 5–7 narrow, toothed leaflets with sharp points. Male and female flowers are on separate plants. Male plants have clusters of drooping male flowers with 5 creamy-yellow sepals and 5 stamens. Shorter female plants have stalkless flowers with erect styles. It spreads from seeds.

Hemp is chemically different from psychoactive marijuana (*C. indica*). Throughout human history there have been a variety of medicinal and practical uses for *C. sativa*, including rope making, fabric, and paper. The plant was first introduced in Nebraska in 1889, and industrial production was encouraged as late as WW II. Currently, farmers who grow industrial hemp must acquire a permit from the Nebraska Department of Agriculture. The plant is pollinated by wind, not insects.

Buckbrush

Symphoricarpos occidentalis

Native deciduous shrub. Photographed on June 18, 2017, on a south-central hill. It is widespread throughout the hills and woods.

Arching stems grow 2–4' tall and spread by stolons to create large, often impenetrable thickets. Clusters of bell-shaped, pink-white flowers at stems tips and leaf axils have bell-shaped corollas with 5 lobes that do not open fully. As they mature, the densely packed flowers become dull, greenish–white fruit, each with one seed. Oval leaves have variable shapes; the upper surfaces are dull blue-green and the lower surface is lighter.

This attractive plant, also called "wolfberry" can be an invasive nuisance in pastures when it crowds out desirable grasses and forbs. A toxic chemical makes the fruit inedible for humans and cattle, but they are a valuable food source for many kinds of insects and birds. Deer browse the foliage, and the shrub provides cover for wildlife. The leaves, fruit, and bark have been used medicinally.

Scouring rush

Equisetum hyemale

Native reed-like, evergreen perennial. Photographed on June 17, 2018, on the river sandbar.

Scouring rush is a non-flowering plant that grows 2–3' tall on rigid stems above creeping rhizomes. Sterile, bamboo-like green stems, which are hollow and unbranched, are divided by nodes encircled by rough ridges of thin black bands and narrow, toothed, scale-like leaves fused into a gray sheath. The leaves fall off as the plant matures. The sharp-tipped cone-like structure at the top of stems produces spores and falls off after the spores are released.

Equisetum is the only living example of a surviving genus of primitive plants that go back over 300 million years. Though related to spore-bearing ferns, they are neither a fern nor a rush. With a 25% silica content, scouring rush has had many medicinal and practical uses. For example, it has been used by Native Americans, European-American settlers, and contemporary campers to clean pots and dishes. It grows in a large colony on the sandbar and can survive flooding.

Blue-eyed grass

Sisyrinchium montanum

Native perennial. Photographed on May 16, 2011, on a south-central hill. Since taking this photo, I've been thrilled to find larger patches of this dainty flower in several upland pastures.

Blue-eyed grass grows up to 1' tall from fibrous roots. One or more flowers grow at the end of a flattened, erect stem with two long, wing-like bracts running the length. Although they are not shown in this image, there are often several stems and flowers growing from the base of a plant. Erect, grass-like leaves are half as tall as the flower stem. The blue to violet flowers have 3 petals and 3 blue sepals, each with a sharp tip, purple nectar lines, and a yellow spot at the base. There is a column of 3 fused yellow stamens in the center. It is self-seeding.

Bees are attracted to the pollen and nectar. In his writing about wildflowers at Walden Pond, Henry David Thoreau made notes about this appealing plant: "The blue-eyed grass, so beautiful near at hand, imparts a kind of slate or clay blue tinge to the meads." (Wisner, p. 102).

Starry false Solomon's seal

Maianthemum stellatum

Native perennial. Photographed on May 15, 2017, in the woods along the river, where colonies are fairly common. They are less abundant in other woody areas.

False Solomon's seal grows up to 1' tall from thick rhizomes that often form colonies. The stem usually tilts to the side and arcs upward at the top. Narrow, curving leaves with deep veins clasp the stem and zigzag along the length of it. A spike of creamy white, star-shaped flowers with pale, yellow-tipped stamens are loosely grouped at the end of the stems. The spherical, waxy berries turn from green with dark purple stripes to deep purplish-red.

This plant can be mistaken for False Solomon's Seal (*M. racemosum*), which has larger leaves and flower clusters, and Solomon's Seal (*Polygonatum biflorum*), with pairs of flowers hanging from leaf axils. Flowers attract small bees, flies, and beetles, and songbirds and rodents eat the berries. Cooked shoots can be eaten, and American Indian tribes used dried, powdered or pulped roots for medicine.

Purple loosestrife

Lythrum salicaria

Naturalized perennial. Photographed on July 28, 2016, on the river sandbar. It becoming increasingly common on properties up and down the river bank.

Purple loosestrife can grow over 8' tall on multiple squarish stems arising from a strong woody taproot and a fibrous root system. Up to 4" long, the lance-shaped leaves have rounded bases. Long spikes at the end of stems have densely packed pink-purple flowers with pointed petals that have a dark vein down the middle and a crumpled tissue-paper texture. The tubular calyx is light yellow-green; after the petals fall off, the calyx becomes a brown capsule holding many seeds.

This wetland invader is on the noxious weed list in 29 states. It is an attractive plant that may have been introduced in the United States in the early 1800s for its ornamental value. But each plant can produce up to 2.5 million tiny seeds a year—and roots send up new shoots. It spreads rapidly and overwhelms other vegetation to create an inhospitable environment for native wildlife and plants.

Catchweed bedstraw

Galium aparine

Native annual. Photographed on May 15, 2017, in the river woods near the river. It is also grows in pastures near woody draws.

Catchweed bedstraw has stiff, square stems that grow 2–3' long from a taproot. Upper leaves and stems are covered in tiny hooked hairs. Eight long, narrow leaves form whorls at intervals along the stems, and clusters of small, 4-petalled white flowers grow at upper leaf axils. The fruit is a tiny round capsule covered in barbs.

The plant shown here was leaning upright against a downed tree trunk, but it is usually found entangled in other low-lying plants. Catchweed bedstraw acquired its name because the short, sharp spines of the fruit attach to animal fur and clothing. People used to pack dry bedstraw into their mattresses, and it has been used medicinally in modern homeopathy and tradiitonal cultures. The Lakota made a salve of the roots to treat skin irritations, and used seeds as a coffee substitute.

Flower-of-an-hour

Hibiscus trionum

Naturalized annual from Europe. Photographed on July 9, 2016, along the gravel road on the far southeast side. After road construction in 2021, a patch is growing on the northwest end of the road.

Flower-of-an-hour has an erect stem that grows up to 2' tall from fibrous roots. Three-part, deeply lobed, rounded leaves grow on long, hairy stalks. The cup-like 2" wide flowers have a wide, segmented calyx surrounding 5 overlapping, creamy white petals, with a deep maroon throat and numerous yellow stamen clustered in the center. The flowers wilt after a few hours of blooming. The unripe fruit is enclosed in a papery, lantern-shaped, light brown capsule with darker ribs.

Because the flowers open only in sunlight, the early morning moon in this layered composition is somewhat misleading. Flower-of-an-hour is related to the Rose of Sharon shrub (*H. syriacus*). The plant self-seeds and returns every year, and it can be weedy on disturbed ground. Bumblebees are the primary pollinators, and some caterpillars feed on the foliage.

Scarlet globe mallow

Sphaeralcea coccineae

Native perennial. Photographed on May 27, 2014, on a dry hilltop in the far southeast pasture, where the bright, attractive flowers are often common. They are not common in other areas.

Scarlet globe mallow is a low-growing plant reaching 1' tall from a thick, deep taproot. It spreads through rhizomes that form colonies. Stems and gray-green leaves are covered with soft, dense hairs. Palm-like leaves have 3–5 lobed leaflets, with a fold down the middle. Clusters of 1"wide, cup-shaped flowers grow at nodes of upper leaves. Flowers have 5 hairy, green sepals behind 5 overlapping heart-shaped, red-orange petals. In the yellowish center of the flower is a column of yellow stamens.

This drought-resistant plant is common in dry areas of the West. It is pollinated by bees, and the seeds are a food source for many herbivores. M. Lewis collected it in Montana on August 20, 1806. Leaves are slimy when they are crushed. The mucilaginous foliage and roots have been used medicinally. Plants in the mallow family are related to ornamentals like hibiscus, as well to okra and cotton.

Velvet leaf

Abutilon theophrasti

Naturalized annual from India or China. Photographed on August 8, 2016, on disturbed ground in the north-central pasture. It is often abundant along the gravel road.

Velvet leaf grows up to 7' tall on erect stems above a taproot. The thick stems, branches, and large, floppy, heart-shaped leaves have soft, velvety surfaces with prominent veins. One or two 1" wide, cup-shaped flowers with 5 overlapping yellow petals bloom at upper leaf axils. Every cup-shaped seed capsule has a ring of 10–15 woody seed pod sections, each with a small spike on the outer edge. The flat-topped seed capsule turns black later in the season.

This lanky plant grows in disturbed areas and can be an aggressive weed, especially in crops. Seeds can remain viable for over 50 years. In some countries, however,velvet lead has been cultivated for use in cooking, medicine, and as a fiber crop. Various bees feed on the nectar and pollen, and other insects and larvae consume the foliage. Dried seed capsules often remain on the stalks in the winter.

Common milkweed

Asclepias syriaca

Native perennial. Photographed on June 28, 2009, along the county road. Colonies are appearing in pastures on the south side, especially after two controlled burns.

Common milkweed grows 3–4' tall and spreads by deep rhizomes and seeds. Thick stems and leaves produce a milky juice when cut. Oblong leaves have a prominent reddish-green central vein, light green perpendicular veins, and a velvety texture on the lower surface. Drooping, dome-shaped clusters of small flowers occur at upper leaf axils. When open, each flower has a 5-parted hood above 5 downward curving petals. When the rough-textured, spindle-shaped seed pods open, the small brown seeds have silky white plumes that disperse in the wind.

This plant's sweet fragrance attracts many kinds of bees and butterflies. Milkweeds are the only plants on which monarch butterfly larvae and caterpillars feed and plant their chrysalis. Diminishing grasslands have reduced milkweed and monarch populations.

Green milkweed

Asclepias viridiflora

Native perennial. Photographed June 17, 2017, on the side of a dry hill in south-central pasture. They are not abundant here, but I've found other solitary examples.

Green milkweed grows up to 2' tall from a central taproot below an erect purplish stem covered in matted hairs. The shape of the wavy, fleshy, leaves is variable, from lance-oblong, shown here, to narrow and linear. Leaves often have reddish central veins and leaf margins, and perpendicular veins. Rounded clusters of greenish white to purplish flowers grow at upper leaf nodes; the clusters tend to tilt downward. Each flower has a 5-part crown and 5 petals that pull back from the crown. Blunt hoods surround a central reproductive column containing packets of sticky pollen that trap insects. Spindle-shaped pods that split open hold seeds with long, whitish hairs.

Bumblebees are the primary pollinators, but other insects feed on the foliage, especially the monarch butterfly caterpillars. The toxic, bitter taste of the folliage repels most mammals.

Whorled milkweed

Asclepias verticillata

Native perennial. Photographed on August 7, 2010, in the south-central pasture. It is common here and in other open pastures.

Whorled milkweed is a slender, narrow-leaved plant that grows 1–2' tall on erect, often unbranched stems. It spreads through seeds and rhizomes that create colonies. Multiple whorls of 4–6" long, curving leaves radiate around the stem. The leaves are ridged with a center groove and have rolled leaf margins. Round clusters of 20–30 greenish white flowers grow at upper leaf axils; each has 5 underlying sepals, 5 white petals, 5 white hoods (like small open tubes) with curling horns, and a reproductive column in the center. After blooming, a long brown pod develops with silky-tailed seeds.

Like other milkweeds, the plant has a poisonous milky sap that is distasteful to livestock. But the sap also has a protective function: when monarch butterflies consume it, they become unpalatable to predators. Butterflies are attracted to the flowers, and bees and wasps are effective pollinators.

White milkwort

Polygala alba

Native perennial. Photographed on June 14, 2021, on a dry, gravelly hilltop in the far southeast pasture. Though a few plants were scattered in this area, I haven't found it in other pastures. It is more common in locations west of here.

White milkwort grows up to 18" tall on several slender, unbranched stems that emerge from a thick base. Narrow, linear leaves become sparce and smaller toward the top. Spikes of small, 1/8" white flowers bloom from the bottom up. Each flower has two petals that form a tube, a central keel petal with 8 long lobes, and rounded, petal-like sepals that form side wings. The center of the flower is yellowish-green. The plant spreads by seeds.

The Lewis and Clark Expedition collected a specimen of this plant on August 10, 1806 near Williston, North Dakota. Boiled roots were used by Lakota people to remedy earaches. Although birds and butterflies are attracted to this plant, mammals tend to avoid its bitter taste.

American germander

Teucrium canadense

Native perennial. Photographed on July 22, 2016, in the south-central meadow, which is often wet. I've seen it a few other areas that have flooded, but it is not common.

American germander has slender, square stems topped with spike-shaped clusters of pinkish to lavender flowers with darker spotting. It grows about 2–3' tall and spreads by rhizomes to form large colonies. Rough, lance-like leaves, with distinct veins and toothed margins, are fragrant when crushed, but the flowers are not fragrant. Each flower has a hairy, bell-shaped calyx that supports two upper horn-like projections and a longer lower lip, with purple-tipped stamens arch over it. Flower spikes. bloom from bottom to top . As it matures, the spike elongates, and the spent flowers form fruit.

Long-tongued bees and other insects perch on the lower lip to pollinate the plant. The leaves are bitter, so mammals tend not to eat the foliage. There are a number of pharmacologically valuable chemicals in the plant, and Native Americans made medicinal teas from the leaves.

Catnip

Nepata cataria

Naturalized perennial from Eurasia. Photographed on July 9, 2016, on a disturbed site where a stack of trees had been burned. Clumps are found in many locations in open pastures and woods.

Catnip grows over 3' tall from a strong taproots and rhizomes that form colonies. The 4-sided, grooved stems bear triangular or heart-shaped leaves with rounded teeth along the margins and distinct veins. Small, tubular, two-lipped white flowers with pinkish-purple spots grow in spike-like clusters at the ends of the stems.

Catnip attracts long-tongued bees and some butterflies. It's a weedy plant that I don't find very attractive, but it is fragrant to walk through. The leaves are roughly textured, and when crushed, they emit a musty, minty odor. Before being brought to this country, catnip was used medicinally in Europe for its soothing and curative qualities, and Native Americans also found many uses for it, including treating colds and fever. It can be crushed and applied to skin as a mosquito repellant.

Lanceleaf sage

Salvia reflexa

Native annual. Photographed on August 24, 2017, in a disturbed southeast pasture. It is scattered in other lowland areas but is not abundant.

Lanceleaf sage grows on an erect, branching stem that reaches over 2' tall above a taproot. Narrow, pointed leaves are cupped upwards, and pairs of small light blue flowers grow on racemes at the axils of upper leaves. A green, tubular calyx with a central fold and prominent ridges holds a small white, fused upper petal and a broad, light blue, lower petal with curved side lobes and a creased center. Crushed leaves have a minty fragrance.

Ground-foraging birds eat the nutlets. A number of cultures have used dried salvia leaves and seeds medicinally and for food. Lewis collected lanceleaf sage on September 21, 1804, along the Missouri River in the area of Lyman County, SD. Nitrates in the plant have been known to poison cattle, but they avoid the stong odor. It is considered a pesty weed in many agricultural areas of the country.

Rough false pennyroyal

Hedeoma hispida

Native annual. Photographed on July 13, 2018, in a bare area in a northwest pasture. It is not common here.

This small plant grows to about 9" tall with erect, hairy, square stems that may be branched at the base. Opposite leaves are about 3/4" long and 1/8" wide. Tiny 1/4" blue to purple tubular flowers form whorls around the stem at the leaf axils. The tubular calyx is deeply ribbed and covered with fine hairs. In this photo, the petals have fallen off, and all that remains are the calyxes, which are turning brown.

This inconspicuous plant is often hidden among taller grasses. It took me several years to identify it. Although it is in the mint family, it is only faintly scented. I wasn't able to find information about what insects and wildlife are attracted to it.

Rough bugleweed

Lycopus asper

Native perennial. Photographed on August 11, 2017, along the river bank, where it is spreading. It is also plentiful along a creek on the far southeast side.

American bugleweed grows 1–3' tall with erect, square stems. It spreads by seeds and stolons that take roots at nodes. Opposite, toothed leaves become smaller toward the top. Dense clusters of small white tubular flowers form ring-like whorls where the leaves are attached. Each tubular flower has 4 spreading petals and 2 purple-tipped stamen that protrude from the center to the edge of the petals. There are a few dark pink spots on the petals. At the base of each flower there is a hairy calyx with pointed tips.

Unlike most plants in the mint family, it is not aromatic. Butterflies and bees are attracted to the pollen and nectar, and it can be a valuable source for honey. Insects feed on the foliage, but the plant has a bitter taste and mammals do not eat it.

Wild bergamot

Monarda fistulosa

Native perennial. Photographed on July 26, 2015, in a colony in the south-central hills. Large colonies are also found in the northwest and southwest hills.

Wild bergamot grows up to 4' tall on erect, branching stems, and spreads by creeping rhizomes and seeds. Round clusters of 20–50 small flowers encircle stems at the leaf axils. Enclosed by a pinkish tubular calyx, each pink flower has a straight upper lip, curved lower lip, and 2 long, brown-tipped stamen. Hairy, lance-shaped leaves have toothed margins. The brownseed heads are dome-shaped.

Wild bergamot, also called "bee balm," has a pleasant, spicy scent. It is one of my favorite plants—I can smell wild bergamots in the pastures, even when I don't see them. Wild bergamot remains fragrant when dry and has been used in teas and in sachets. Americans Indians medicinal uses as teas and poultices—and as a love charm. Monarda oil is still used for its healing properties in modern herbalism. Pollinators include long-tongued bees and butterflies.

Wild mint

Mentha arvensis

Native perennial. Photographed on August 8, 2017, on a small mound in the middle of a river inlet. I unexpectedly found this plant when I was kayaking along our river bank, but it disappeared the next year from higher water levels.

Wild mint grows up to 4' tall on erect, branching stems, and it spreads by creeping rhizomes and seeds. Round clusters of 20–50 small flowers encircle stems at the leaf axils. Enclosed by a pinkish tubular calyx, each pink to lavender flower has a straight upper lip, a curved lower lip, and 2 long, brown-tipped stamen. The hairy, lance-shaped leaves have toothed margins and distinct veins. Dome-shaped seed heads turn brown as the seeds ripen.

This plant is also called "field mint." Flies and wasps are the primary collectors of nectar. Mammals do not generally eat mint. Like most plants in the mint family, the leaves are very aromatic. They are used in herbal teas, and antibacterial oils have been extracted for use in medicines and flavoring food.

Moonseed

Menispermum canadense

Native perennial vine. Photographed on June 20, 2020, in the woods along the river. It is also found in woody draws, shrub thickets, and in the woods and ground along the county road.

Moonseed is a woody vine that grows up to 30' from underground rhizomes that form colonies. The plant twines around other vegetation or spreads along the ground, but unlike some other vines, it does not have tendrils. Heart-shaped, leathery leaves have long leaf stalks and are variably shaped, many with shallow, pointed lobes. Male and female flowers are in separate clusters or different plants. Branching clusters of small greenish-white flowers, up to 7" long, grow at leaf axils. Each has 4–9 petals and an equal number of sepals. Male flowers have multiple stamen with yellow tips. The seeds are half-moon shaped. The vine usually dies back to the ground each winter.

It is pollinated primarily by bees, and woodland birds eat the berries. The vines are s a good habitat for nesting and cover. The purple-black berries and all parts of the plants are highly poisonous.

Field bindweed

Convolvulus arvensis

Naturalized perennial vine from Eurasia. Photographed on June 2, 2013, in a north-central pasture, and it is common in many of the pastures.

Field bindweed is a weedy vine with weak stems, up to 6' long, that spread along the ground and entangle themselves in a counter-clockwise direction around other plants. It also spiral straight up the stems of tall grasses. Trumpet-shaped flowers grow on slender flower stalks; each flower has 5 fused white petals with tinges of pink, a yellow throat, 5 stamen, and a divided style. Each flower lasts only one day. Leaves are shaped like arrowheads. Seeds can remain in the soil for over 50 years, and bindweed also spreads underground through an extensive system of creeping rhizomes..

Long-tongued bees are attracted to the nectar, and various insects and larvae feed on the foliage. It competes with other plants and is a difficult plant to eradicate. Another name for this plant is "Creeping Jenny," and local homeowners often curse the vine as it invades their gardens and lawns.

Hedge bindweed

Calystegia sepium

Native perennial vine. Photographed on June 7, 2017, in a wet meadow in the south-central pasture. I've also found it winding through some buckbrush thickets.

Hedge bindweed stems, which can grow up to 10' long, spread and entangle themselves in other plants and grasses. At least 3" wide, the trumpet-like flowers are larger than field bindweed, but the flower shape and other characteristics are very similar. The fused white petals turn yellow in the center. The base of the leaves is deeply lobed, and the tip is pointed and folded. The plant is self-seeding, and it also spreads through an extensive rhizome system.

Long-tongued bees gather nectar, and other insects feed on the foliage. Although it has an attractive flower, hedge bindweed can be an aggressive weed that chokes out other plants, even shrubs and small trees. Luckily, it's not as common here as the field bindweed, partly because the meadow where I first found hedge bindweed has flooded in recent years, and tall prairie cordgrass (*Spartina pectinata*) has taken over.

Blue mustard

Chorispora tenella

Naturalized winter annual from Asia and Europe. Photographed on April 21, 2017, in a northwest pasture where a culvert had been replaced, and it grows in other disturbed areas.

Blue mustard is a slender plant that grows up to 2' tall, with hairy, erect stems. Bluish-green leaves have wavy, toothed edges, and both the stem and leaves are sticky. Small lavendar flowers have a tubular, hairy calyx that holds 4 spoon-like, twisting petals that make a cross shape. Narrow, beaked siliques, or fruits, hold many small reddish-brown seeds, and the plant is self-seeding.

Blue mustard is one of the first plants to appear in the spring when the grass is still low. When they spread over a large area, the blooming plants look like a green and lavender carpet. Ground-foraging birds eat the seeds, and long-tongued bees and butterflies access nectar in the narrow-throated calyx. The plant is also called "musk mustard," and the earthy aroma is said to be similar to warm Crayolas. Leaves of young plants are edible in salad or they can be cooked.

Carolina whitlow-grass

Draba reptans

Native winter annual. Photographed on April 28, 2019, in the disturbed meadow along the river. I have not observed any since then.

This early spring plant grows 2–10" tall on an erect, purplish stem that is hairy at the base but hairless above the leaves. Clusters of up to 12 white flowers grow on smooth, slender stalks at the end of the stem. Flowers have 4 green sepals supporting 4 notched white petals and 6 yellow stamens. The flower stalk emerges from a rosette of thick basal leaves that are both hairy and dimpled; the hairs are connected at their centers, forming a V. Later in the season, tiny, self-pollinating flowers appear, but they do not have petals. As the plants mature, flowers are replaced with small, flattened siliques arranged like an upside-down candelabra.

I hadn't noticed these miniature plants until I suddenly saw many of them in the wet spring of 2019. The Carolina whitlow-grass in the image was only about 5" tall. The nectar attracts some bees.

Dame's rocket

Hesperis matronalis

Naturalized biennial from Europe. Photographed on May 21, 2017, in the river woods. In 2021, I found large colonies of dame's rocket lining the sides of deep draws on the far southwest side.

Dame's rocket grows up to 4' tall on erect stems that branch toward the top. Clusters of up to 30 flowers bloom on spikes at upper leaf axils; each flower has 4 bright lavender petals; some may be white or pink. Stems emerge from a rosette of lance-shaped, toothed basal leaves that wither as the flowers begin to bloom. Flowers become 4" narrow, cylindrical seed pods that stick out at an angle.

This plant has a sweet fragrance late in the day. Cultivated 2,000 years ago in ancient Roman gardens, it was one of the first flowers to be planted by early European settlers, but it has become a renegade along rural roads and creeks. It is a prolific self-seeder that can be an invasive weed. The leaves are said to be delicious and spinach-like when they are cooked. The nectar and pollen attract long-tongued bees and butterflies, and the seeds are eaten by ground-foraging birds.

Field pennycress

Thlaspi arvense

Naturalized winter annual from Europe. Photographed on May 25, 2014, in a disturbed northwest pasture. It is scattered on disturbed ground in other pastures.

The slender, erect stem, with some side stems, grows up to 2' tall above a taproot. Stems emerge from winter rosettes with 1-4" long leaves, tapered at the end and toothed. Upper stems end in racemes of small white, 4-petalled flowers and 4 green sepals with white edges. Like most plants in the mustard family, the flower spikes elongate as they mature. Spent flowers become erect, coin-shaped seedpods that are notched at the tip. Each pod holds up to 8 seeds.

Self-pollinating and self-seeding, field pennycress grows in many areas of the pasture and can be a nuisance. The plant has a bitter, garlicky taste that is not usually eaten by mammals. Small bees and flies visit the plant, and ground foraging birds may eat the seeds. Shepherd's purse (*Capsella bursa-pastoris*), a similar plant with triangular seed pods, also grows here, but I have not photographed it.

Hoary cress

Cardaria draba

Non-native perennial from Eurasia. Photographed on May 15, 2019, in a disturbed meadow.

Hoary cress grows up to 2' tall on thick stems that branch toward the top. Flat-topped clusters of tiny 4-petalled white flowers on thin flower stalks form at the ends of stems. Clusters do not elongate as much as many other in the mustard family. Soft and hairy, lance-shaped leaves have wavy, toothed edges. Leaves are toothed, stalked and dense toward the bottom, and they clasp the stems and become narrower toward the top of the plant. The flat 2-celled seed pods are heart-shaped.

This aggressive weed, also called "whitetop," spreads by both rhizomes and seeds and has been increasing in a number of places here. It is not usually grazed by livestock, but ground-foraging birds eat the seeds and bees make honey from it. Leaves can be eaten raw or cooked—in limited amounts—in the early spring, and the seeds can be used as a peppery seasoning. Hoary cress has been used in traditional medicine to relieve flatulence.

Peppergrass

Lepidum densiflorum

Winter annual of uncertain origin; could be US or Eurasia. Photographed on June 12, 2021, along the gravel county road, and it is common on other disturbed sites, especially along gravel paths.

Peppergrass grows 6-20" tall on erect, branching stems above a taproot. Clusters of tiny light green and white, short stalked flowers grow at the tip of elongating branches. Basal rosettes of long leaves with round lobes appear in the spring, but as the plant develops the basal leaves wither; leaves toward the top of the plant are more linear and smaller. The plant is most identifiable by the flat, oval 2-celled seed pods that form long, blunt spikes along the branches. The seed pods are notched at their tips. Seeds are distributed by wind.

This rather inconspicuous plant attracts small bees and flies, and some caterpillars eat the foliage. Peppery-tasting mustard oil discourages most mammals from eating it. Young leaves are nutritious and can be eaten cooked or fresh, and seeds have been used as a pepper replacement.

Tall hedge mustard

Sisymbrium loeselii

Naturalized winter annual from Europe. Photographed on June 3, 2014, in a north-central pasture, and it can become abundant in disturbed areas in the pastures and along the road.

The erect stems of tall hedge mustard develop from overwintering rosettes. They grow over 4' tall. Basal and stem leaves have a triangular central lobe and two smaller side lobes. Flowers form loose globular clusters on racemes at the leaf axils of upper stems. Each yellow flower on a short flower stalk has 4 greenish-yellow sepals behind 4 petals and 6 stamen with yellow anthers. As the stems elongate, they bear new flowers. Spent flowers become slender, cylindrical seed pods that radiate out from the stems.

Although it can be a nuisance in disturbed pastures, it becomes a vibrant yellow mass when many are blooming together. Producing chemicals that inhibit germination of some species, it can be destructive to native habitats. Young leaves are edible in salads, and seeds can be used for seasoning.

Tansy mustard

Descurainia pinnata

Native annual. Photographed on May 15, 2017, on disturbed ground in a northeast pasture. It is not widespread.

Tansy mustard is an early spring plant that grows up to 2' tall on erect, occasionally branched stems. Feathery compound leaves are divided into leaflets that are further divided with tiny, pointed, toothed lobes. Leaves, stems, flower stalks, and sepals are covered in short hairs. Clusters of small yellow flowers form racemes at the end of elongating stems. Each flower is on a slender stalk, with 4 yellow sepals behind 4 larger, spoon-shaped petals, and with 6 stamen around a thick yellow style. As they mature, the flowers become narrow, club-shaped seed pods that resemble antennae.

Tansy mustard reseeds itself, and the wet, sticky seeds are spread by birds and animals. It can become a somewhat weedy plant. It is toxic in large quantities for livestock. Flies and some other insects are attracted to the pollen and nectar. Native American tribes ground seed for flour or meal.

Western wallflower

Erysimum asperum

Native biennial. Photographed in a north-central pasture on May 5, 2016. It is scattered in a few other dry pastures, but it is not abundant.

Western wallflower grows 6–18" tall on a single erect, unbranched stem above a taproot. In the first year there is a rosette of toothed basal leaves. In the second year, one or more dense, elongating racemes of yellow flowers grow at the end of the stem. Each flower has 4 sepals, 4 round petals forming an X, and 6 yellow stamen. Slender horizontal seedpods grow 3–5" long. The hairy, gray-green leaves become less toothed and smaller toward the top of the plant.

European settles and Native American traditions have used this plant for various medicines. The Lakota, for example, used all parts of the plant to treat stomach and bowel cramps. Short-tongued bees and small flies are attracted to the flower. Lewis collected a close variety of this plant on May 14, 1806, in Idaho.

Stinging nettle

Urtica dioica

Native perennial. Photographed on August 25, 2017, in dense stands along the gravel county road. I have also found it in wooded draws.

Stinging nettle is a weedy plant that grows up to 6' tall on erect, usually upright stems—this particular example was bowed over from the weight of its flowers. The leaves, which grow in pairs along hairy stems, have a leathery appearance and coarsely-toothed edges. Clusters of small creamy green to pinkish flowers grow along wire-like stems at leaf axils.

The hairs on the stem and leaves break off when disturbed and become needles that inject inflammatory chemicals into the skin of passing mammals. When I accidentally walked with bare arms through a stand of stinging nettle, I found out the hard way that they really do sting! European, Native American, and contemporary herbalists have found medicinal uses for treating pain, allergies, and other ailments. The nutritious leaves can be eaten after they are boiled or dried.

Buffalo bur

Solanum rostratum

Native annual. Photographed on July 9, 2016, in a disturbed meadow in the southeast pasture. It has been invasive in areas of bare soil after controlled burns and roadwork.

Buffalo bur is a grows up to 3' tall and equally wide on erect stems with many branches. Stems, leaves, and calyx are all covered in yellow spines. Irregularly shaped, deeply-lobed leaves have spines along the central veins. Elongating racemes of funnel-like, yellow flowers have 5 fused petals with crinkled edges. Five yellow, tubular stamens and an elongated, curved style protrude from the center. The egg-shaped fruit also has prickly spines. When the plant is mature, the stem breaks off and tumbles in the wind, spreading many seeds.

Buffalo bur is related to petunias and to common foods including potatoes and eggplant. But like some other plants in the nightshade family, it is highly poisonous and dangerous to both cattle and humans if injested. I've often seen them covered in bumblebees buzzling loudly in the sun.

Virginia ground cherry

Physalis virginiana

Native perennial. Photographed on July 20, 2017, along the road, where it is common. There are also patches in the soutwest pasture.

Virginia ground cherry reaches up to 2' tall on erect, hairy stems. It spreads with rhizomes and seeds and can become weedy. The 3" long, lance-shaped, alternating leaves have irregular teeth along the margins. Yellow flowers with greenish-purple throats grow on short stalks at the axils of the leaves. After blooming, the calyx inflates into a lattern-like shell that encases a berry. As it matures, the bladder-like papery green shell turns tan, and the berry turns from green to reddish-orange.

This is an unbranched example of a ground cherry—most have many branches and flowers. The fruit is poisonous when still green, but it becomes edible when ripe, particularly after an early frost. It is said to taste somewhat like tomatoes, and it can be eaten raw or cooked in sauces and jelly, where the bland flavor can be enhanced with sugar. Birds and small mammals eat the berries.

Buffaloberry

Shepherdia argentea

Native shrub. Photographed on July 18, 2009, among a clump of trees and shrubs on a northwest hillside. It's the only one I've found.

Buffaloberry is a bushy shrub that can grow up to 16' high, with underground rhizomes that often form dense thickets. The leaf surfaces have silvery scales, and the bottom surface is the palest. A single thorn often grows at the end of mature branches. The small yellow flowers, which have a 4-part calyx but no petals, grow in dense clusters on short branches. Male and female flowers grow on separate plants, and berries appear only on female plants that have been pollinated by a male. The showy, red, berry-like fruit seen in mid-summer are more noticeable than the spring flowers.

The unripe fruit is tart; it becomes sweeter after a few frosts, but birds usually take the fruit before then. M. Lewis collected buffaloberry on September 4, 1804, where the Missouri River meets the Niobrara River. Lewis wrote that it had a flavor like cranberries.

Poison hemlock

Conium maculatum

Naturalized biennial from Eurasia. Photographed on June 15, 2020, in a wet meadow on the far east side. I thought it was a solitary example, but in 2021 I found it spreading in several draws.

Poison hemlock can grow up to 10' tall from a single white taproot below a branching, hollow stem that is covered in purple blotches toward the base.The triangular compound leaves have a lacy, fern-like appearance that make ot look like the top of a very large carrot plant. Umbrella-like stalked clusters of white flowers radiate out from stem-tips. Each flower has 5 white notched and folded petals, 5 white-tipped stamen, and a white nectar pad in the center.

All parts of this plant are poisonous to humans and animals. It is said to have been used in ancient Greece to poison prisoners, including Socrates in 399 BC. Hemlock has medicinal uses when it is diluted in a homeopathic preparation. A variety of bees, flies, and wasps are attracted to the nectar, and various insects feed on the foliage, but mammals are repelled by the foul odor.

Common chickweed

Stellaria media

Naturalized annual from Eurasia. Photographed May 16, 2018, in the shaded woods along the river.

Common chickweed has prostrate to ascending stems that grow up to 20" long and have many branches. Weak, hairy stems often lay on the ground and create new roots and shoots at leaf nodes. Oval leaves with sharp tips grow opposite each other the along stems, and flowers grow from some of the leaf axils. The small white flowers have five separated petals that are deeply divided in the middle. Five sharp-pointed sepals create a star shape behind the petals.

This is a common weed around the world. All parts of the plant are reported to be edible cooked or raw, and some traditional cultures and modern homeopathy have medicinal uses for it, especially for its laxative and anti-inflammatory properties. Seeds and leaves are consumed by a variety of songbirds and mammals. I think I've seen giant chickweed (*Myosoton aquatica*) growing here, too, but I don't have photographs of it.

Deptford pink

Dianthus armeria

Naturalized annual from Europe. Photographed July 6, 2020, in a meaodw on the southeast side. I've found it only in this one location, and it has disappeared.

Deptford pink reaches up to 30" tall on an erect, sparcely branching, round stem that emerges from a slender taproot. Clusters of .5" wide pink flowers with hairy stalks grow at the end of upper stems. Each flower has 5 bright pink, wedge-shaped petals surrounded by a calyx and leaf-like, bristly bracts. The petals are notched at the tips and have faint white spots. Bluish purple anthers stand out from the center of the flower, and there is a pair of pink-tipped stigmas. The plant reseeds itself.

The name of the plant is a reference to Deptford, which was originally a Tudor community outside of London. I unexpectedly found it when I was out walking on a sunny day. I initially passed it by, but my peripheral vision caught a vivid pink color among the grasses, and I walked back to take a look. I didn't have my camera on me then, but I found the plant again the next day to take this photo.

Blackseed plantain

Plantago rugelii

Native perennial. Photographed on July 28th, 2016, on the river sandbar, and it grows in a few other disturbed areas.

Blackseed plantain grows up to 16" tall from a taproot and fibrous roots, with multiple stems emerging from a basal rosette. Leathery oval leaves have short, thick purplish stalks and prominent longitudinal veins. Inconspicuous, densely overlapping flowers are arranged around long thin flower spikes above naked stems. The nearly translucent flowers have 4 triangular sepals that fold back into the calyx. Veins and margins of the leaves turn reddish green, and seed capsules turn light brown.

This plant, also called "Rugel's plantain," is often found on compacted ground. It is Pollinated by the wind. Young leaves and seeds are edible and nutritious, and seeds can be ground for bread and cereal. Native Americans use leaves as poultice for skin maladies, The plant is also beneficial to a variety of insects, small mammals, and deer.

Water speedwell

Veronica catenata

Native perennial. Photographed on June 21, 2020, on the edge of the river sandbar. I've seen a few on the river bank, but it is not common.

Water speedwell is an aquatic plant that grows up to 2.5' on erect to sprawling, greenish-purple stems. Opposite, lance-shaped leaves clasp the stem at their base. Clusters of small lavender-blue, pink or white flowers grow at the tip of the stem and in leaf axils. Each .25" flower is bilaterally symmetrical, with four petals fused at their base into a tube that is greenish at the center. The larger upper petal has dark purple lines that serve as nectar guides. Two lavendar-tipped stamen and a white style project from the tube. The plant spreads in colonies with rhizomes and by rooting at the nodes.

There is debate among experts in the resources I used about the correct classification of this plant. Although there is considerable information about the medicinal and culinary uses of other plants in the *Veronica* genus, I wasn't able to find much information about uses for water speedwell.

Prickly poppy

Argemone polyanthemos

Native biennial. Photographed on July 26, 2016, in a south central meadow. It was the only example I'd seen. It disappeared for a while, but in 2021 it was even larger, with many flowers on it.

Prickly poppy is a well-defended plant that grows around 3' tall from a deep taproot. The thick, erect stem and the leathery, deeply lobed blue-green leaves are spiny, which protects the plant from animals. Broken stems have a yellowish sap, and all parts of the plant are poisonous. The showy white 2–4" wide flowers have 3 prickly sepals, 4–6 crinkly white petals, a rounded yellow cluster of stamens in the middle, and a dark red stigma in the center. The fluttery, delicate quality of the petals contrasts with the toughness of the rest of the plant—even the seed pods have sharp spines.

Prickly poppies are more abundant west in the Nebraska Sandhills. American Indians used parts of the plant medicinally, and roots were used to make yellow die for arrow shafts. Although most mammals are repelled by the plant, various pollinators are attracted to the large, bright flowers.

Fringed loosestrife

Lysimacha ciliata

Native perennial. Photographed on July 6, 2020, along a creek on the far southeast side. I 've never seen it again.

Fringed loosestrife plant grows up to 3' tall on green stems above a taproot and rhizomes. Purplish-green leaves are rounded at the base and pointed at the tips. The star-shaped, tubular yellow flower has 5 broad, petal-like lobes surrounded by a calyx with 5 teeth.The reddish-brown center contains 5 curving stamen and a slender style. Only a few flowers bloom at one time.

The blooms usually nod downward; I cheated in this photo by turning the flower on the right toward me to get a better viewer. Although similarly named, it is not related to the noxious purple loosestrife *(Lythrum salicaria)*g. An early prairie ecologist, Professor J. E. Weaver, wrote in 1954 that fringed loosestrife was the 3rd most important forb in wet prairie lowlands, but I doubt that is the case now. Some bees are attracted to the floral oil and pollen, and insects feed on the foliage.

Western rock jasmine

Androsace occidentalis

Native annual. Photographed on May 15, 2017, on dry a northwest hill. It took me two years before I was able to identify it. In 2019, I found more Western rock jasmine plants in the meadow by the river—they are difficult to spot unless you're really looking!

This tiny plant, which looks like a series of inverted umbrellas, is only about 3" tall. Multiple reddish unbranched stems rise from a rosette of tiny oblong leaves that are pointed at both ends. At the top of each stem is a whorl of pointed green bracts, from which 2–10 slender flower stalks spread out from the same point, each with a tubular green calyx holding 5 fused white petals. The leaves, stems, stalks, and calyx are all covered in minute hairs. In this image, no leaves are visible, and the white petals have been replaced with round, reddish orange seed capsules surrounded by the light orange calyx.

Another name for this plant is "fairy candelabra." The blurry green leaves in the background are probably black medic (*Medicago lupulina*), which is also a low plant.

Black raspberry

Rubus occidentalis

Native shrub. Photographed on May 21, 2017, arching over a tree trunk in the woods near the river. It is common in other woody areas and in some open pastures.

The waxy, somewhat prickly round stems of black raspberry grow up to 12' long. Arching canes take root when their tips touch the ground. Young canes have no flowers in the first year, but they bloom and produce fruit in the second year. Compound leaves have three heart-shaped leaflets with toothed edges and deep veins. From 5–15 flowers grow in clusters on short stalks at the tips of side branches. Flowers have 5 spoon-shaped, spreading white petals alternating with 5 longer, light green, triangular sepals and many stamen.

Various bees are attracted to the nectar. Dense colonies of black raspberry shrubs provide a valuable cover for small mammals and birds. People eat the nutritious fruit raw or cooked in jams or pies, leaves are used for tea, and young shoots can be peeled and cooked.

Bushy cinquefoil

Potentilla supina

Native annual. Photographed on July 19, 2017, along the sandy river bank, where it is spreading. It also grows on the large sandbar.

Bushy cinquefoil is a low growing, bushy plant that reaches up to 12" tall on erect and reclining branching stems. Loose clusters of flowers grow at the ends of branches; each has 5 heart-shaped yellow petals, with 5 pointed green sepals behind and between the petals, and 5 small bractlets behind them. The lower compound leaves have 7 to 11 round-toothed leaflets that get smaller further up the plant. Stems, sepals, and bractlets are covered with short hairs. A pair of leafy, pointed appendages surrounds the base of leaf stalks.

Bushy cinquefoil is known to be abundant along the sandy floodplains of the Missouri River, especially in the Dakotas. Many of the leaves in this image are coated with sand. The plant is pollinated by insects, but I was not able to find information about specific wildlife uses.

Eastern Choke Cherry

Prunus virginiana

Native shrub. Photographed on April 22, 2015 on a bluff on the north side. It is common in shrub thickets in the hills and along the road. This is a composite of several branches that were near each other, but on different shrubs. One of the branches had a tiger swallowtail butterfly on it.

Choke cherry grows 10–25' tall and forms dense thickets through root shoots and seeds. The brown-gray trunk is usually short, with many erect branches. Drooping cylindrical clusters of up to 50 small flowers grow at the ends of branches. Each flower has 5 round white petals surrounding a yellow-orange center, stamen with yellow tips, and a style. Oval leaves have a pointed tip and fine teeth along the margins. The fruit is a dark red sphere encasing a single hard seed.

Butterflies and other insects pollinate it, birds and small mammals eat the berries; and branches provide cover and a nesting habitat. The juicy red berries have long been a staple in the diet of Plains Indians. M. Lewis described choke cherries in his journal on May 12, 1805, in Montana.

Prairie Wild Rose

Rosa arkansana

Native shrub. Photographed on June 21, 2013, in a shaded area near the gravel road. They are common in many areas in both the open pastures and woods.

Prairie wild rose grows up to 20-40" tall. Thick, horizontal roots form colonies. Plants are protected by stiff bristles on the reddish stems. Alternate compound leaves have 5–11 oval leaflets with fine teeth along the edges. The flowers have 5 white to deep pink petals, with numerous yellow stamens radiating in the center around short styles. Notched petals become broader at the ends, and flowers are almost flat when they are mature. After blooming, round fruits, called hips, turn green to red.

This plant is very fragrant, even from a distance. It was collected downriver from here on September 5, 1804, by M. Lewis, in either Knox County, NE, or Charles Mix County, SD. Rose hips provide nutritious food for birds and mammals. The petals and rose hips, which are high in Vitamin C, are used for teas, wines and jellies, and Native Americans used dried hips for soups and stews.

Sulphur cinquefoil

Potentilla recta

Naturalized perennial from Eurasia. Photographed on June 20, 2016, in a meadow along the river bottomland, where it is often plentiful. Smaller amounts also grow in the northwest pastures.

Erect, slender stems of sulphur cinquefoil grow up to 2' tall from a woody taproot. Both stems and compound palmate leaves are hairy. Flowers have 5 heart-shaped, creamy yellow petals in front of and between 5 smaller, pointed green sepals, which fold inward to create seed capsules. Circling the bright yellow center is a loose ring of yellow stamens with brownish-yellow tips. Lower leaves have 5–9 leaflets, and smaller upper leaves have up to 3 leaflets. All leaves have sharply serrated edges and fine diagonal lines on the surface. Sulphur cinquefoil spreads through seeds or new root shoots.

The juices are very astringent; the Latin name means "strong little plant" for its medicinal value. The fruit can be eaten raw or cooked. Bees, small butterflies, and beetles are attracted to the nectar and pollen, and a variety of insects feed on the foliage.

White avens

Geum canadense

Native perennial. Photographed on June 15, 2020, on the shady edge of a northwest pasture. They are also found in open wooded areas.

White avens is a rangy plant that grows up to 2.5 ' tall from a taproot and rhizomes that can create colonies. In the spring, basal leaves form a rosette with 3–7 leaflets, and, as the plant matures, it forms three-part leaves in the middle of the plant and smaller, simple leaves toward the top; all leaves have toothed edges. The flowers grow at the tips of the stems and at leaf axils have long stalks. Each flower has 5 rounded white petals and triangular green sepals between each petal. The yellow-tipped anthers of the stamen surround a dome-shaped cluster of green styles. As they mature, the flowers are replaced with one-seeded fruit that have long hooks which stick to fur and feathers, thus spreading the plant to new locations.

The pollen and nectar attract bees, wasps, flies; beetles, and aphids, and larvae feed on the foliage. In warmer climates the foliage is green all year. It is often the first green that I see here in the spring.

Wild plum

Prunus americana

Native shrub. Photographed on April 15, 2014, on a north-central hill. Thickets are common in the pastures and along the road.

Wild plum grows 10–15' tall and spreads by root suckers to form desnse thickets. Branches have sharp, 2" long thorns. Simple leaves have sharply-toothed edges. Dense clusters of flowers bloom at tips of branches before leaves appear; the thin flower stalks emerge from the same point. Each flower has 5 green sepals behind 5 round to egg-shaped white petals, and multiple yellow tipped stamen radiate from the center. As it matures, the waxy-surfaced fruit turns from green to pink to red.

This is one of the first flowering plants in the spring. It is a host plant for a number of butterfly caterpillars, and butterflies and bees pollinate the flowers. The fruit is consumed by birds, deer browse leaves and twigs, and the thickets provide cover for birds and small mammals. People can eat the fruit raw, but they have a sweeter flavor when they are dried or made into jam.

Wild strawberry

Fragaria virginiana

Native perennial. Photographed on May 15, 2019, in a lightly wooded area on the southeast side. I've seen it in a few other wooded areas.

This low-growing plant grows *4–7"* tall and spreads with surface runners that take root over a considerable distance. Three-part leaves on slender stalks have rough teeth along the edges and prominent veins. Clusters of flowers at the end of stems have 5 sharply pointed green sepals behind 5 round white petals, with many yellow stamen around the yellow center. Seeds are embedded in shallow pits on the surface of the fruit.

Wild strawberry is most visible early in the spring before it is hidden under the taller grasses. Although there can be many blossoms, fruit is less common and depends on the climate at the time. Store-bought strawberries are a hybrid of this plant and other wild Fragaria species. It is cross-pollinated by a variety of bees, flies, and small butterflies. Mammals browse fruit and spread the seeds.

Long-bracted spiderwort

Tradescantia bracteata

Native perennial. Photographed on May 27, 2017, in the south-central hills, where it is common. It was especially abundant after a controlled burn in 2021.

This small plant grows up to 16" tall from thick, fleshy roots. Multiple stems may grow from one root crown, but they are seldom branched. Clusters of 5–15 flowers grow at the stem ends, with hairy purple stalks emerging from one place. Drooping buds become erect when flowering. Two long leaf-like bracts at the base of the flower cluster are folded along the middle and curve downward. Longer, grass-like leaves wrap around the stem toward the base. Hairy oval sepals surround 3 rose-violet petals and 6 stamen with yellow anthers.

Flowers close in the late morning and last only one day. Bumblebees and other insects cross-pollinate them, and herbivores eat the folliage. Lakota people made blue paint with the flowers and wrote songs comparing the flower to the women they loved.

Eyebane

Euphorbia nutans

Native annual. Photographed on August 24, 2017, in a wet area in a southeast meadow. It is an easy plant to overlook because it is often hidden among taller grasses and other plants.

Eyebane is a low-growing, rangy plant that reaches 18" tall on thin, erect red stems with many branches. The top surfaces of the rounded, 1" long, finely toothed leaves may have a red blotch. The 1/8" cyathia, or floral cups, have a reddish gland at the base, and 4 small, white, petal-like extensions along the edge. The true flowers are hidden in the floral cups. A single, 3-lobed, round seed capsule projects out of the cup; the green fruit is tinged with pink and turns red in bright sunlight. Eyebane spreads through seeds and roots.

The leaves and stem of eyebane emit a toxic latex sap if they are damaged. Birds and insects eat the foliage and seeds, but they are poisonous for mammals.

Fire-on-the-mountain

Euphorbia cyathophora

Native annual. Photographed on August 24, 2017, along a creek in a meadow on the far southeast side. It is becoming abundant along another draw in the southeast side.

Fire-on-the-mountain can grow up to 2' tall from a taproot. Branching occurs toward the top. At the end of slender stems are flat-topped clusters of cyathia, like tiny cups made of bracts that hold several male flowers around a single female flower. The female flower has a 3-lobed ovary on a short stalk that develops into 3-celled seed capsules. At the base of the cyathia are green leaf-like bracts, many with a vivid red spot. Long, narrow leaves have irregular shapes. It has a poisonous milky sap.

Another name for this plant is "painted leaf." When I first saw it, I mistook it for grass until I noticed the bright red coloring. It's thrilling to see the intense orangish-red standing out against the light green. It is related to the Christmas poinsettia (*E. pulcherrima)*. M. Lewis collected this plant on October 15, 1804, in North Dakota.

Ground spurge

Euphorbia prostrata

Native annual. Photographed on a gravel driveway on August 30, 2019. It seems to love gravel and often forms a kind of carpet across much of the driveway. It also grows in other disturbed areas.

This plant, also called "prostrate spurge," has hairy, reddish stems growing close to the ground in circular mats up to 4" high. Small, hairy, opposite oval leaves have tiny teeth along the edges, which may be purplish. Dense clusters of tiny cyathia appear on the upper side of branches at the leaf axils. The rim of each cup-like cyathia has 4 red nectar glands with whitish appendages. Four male and one female flower are held in the small, 1/16" cup. The female flower's pistils sit on a round, 3-part ovary that projects out of the center of the cup. The fruit is a tiny, stalked, 3-celled capsule, each holding one seed. From a distance, the tiny flowers look like beads sewn along the branches.

This image is somewhat misleading because the plant looks like it is floating, rather than bound to the ground. I photographed the plant while I was standing above it, then I digitally removed most of the gravel and layered the plant photo on the sky photo.

Leafy spurge

Euphorbia esula

Naturalized perennial from Eurasia. Photographed on May 15, 2017, in a northwest pasture, and I've found it in unexpected places in other pastures. So far, however, it is not abundant.

Leafy spurge is a noxious weed that grows up to 2.5' tall on erect, light green stems. It spreads by seeds and rhizomes that form dense colonies Roots can be 12' deep. Leaf-like bracts at the end of the main stem support radiating, umbrella-like clusters of flowers on forking stems. Heart-shaped, greenish-yellow bracts support tiny flowers, each with 4 flat glands with horn-like projections. The developing fruit is a tiny 3-lobed green capsule with a single seed in each lobe.

Leafy spurge was introduced to the US in early 1800s, probably in contaminated seed. This aggressive, fast-spreading weed is difficult to control and leafy spurge has become a scourge in many states. The milky sap can be toxic to cattle, and the invasive plant crowds out beneficial native forbs and grass. I've been using herbicides to stop its spread.

Myrtle spurge

Euphorbia myrsinites

Introduced perennial succulent from the Mediterranean area. Photographed on May 14, 2021, on a northwest bluff above a neighbor's house along the river. It is the only example I've seen here.

Myrtle spurge is a small plant that grows 4-6" tall, with an 18" wide spread. Trailing stems have waxy, bluish-green, pointed leaves that are closely-packed and spiralling. Small star-shaped yellow flowers are surrounded by cups of rounded, yellow-green bracts. Seeds can be projected up to 15.'

This plant show the importance of understanding the potential impact of planting cultivated exotic plants in a natural setting. A neighbor had planted a number of them along the river bank, where they were attractive. But seeds migrated uphill, through woods, to land in our pasture. It could have become an invasive problem (it is a noxious weed in several far western states). I sprayed and it did not return. It is also a potentially dangerous plant—the leaves, stems, and roots have a caustic latex sap that can cause illness if ingested, and blindness or blisters if it is rubbed in eyes or on skin.

Snow-on-the-mountain

Euphorbia marginata

Native annual. Photographed on July 26, 2010. It is fairly common in sunny areas of the pastures.

Snow-on-the-mountain is an attractive plant that grows up to 3' tall on one erect stem, with branching toward the top. Flat clusters of flowers form at the ends of stems. A cluster of leafy bracts—some with white edges and some completely white—support white, petal-like appendages with light green glands at their base. This structure surrounds male flowers with yellow-green stamens and one female flower with an arcing, divided style. The three–lobed seed capsules eject their seeds several feet.

A milky latex flowing from broken branches and stems can cause skin burns and even blindness if touched. Snow-on-the-mountain was collected by M. Lewis near Blair, Nebraska on August 4, 1804. In this photo, the snow-on-the-mountain is surrounded by a yucca plant (*Yucca glauca*). Small bees and flies are attracted to the nectar and pollen, and a variety of insects feed on the foliage.

Toothed spurge

Euphorbia davidii

Native annual. Photographed on August 21, 2017, in a small colony along the county road. I've seen it in a few other areas of the pastures, but it is not usually abundant.

Toothed spurge grows up to 2' tall with reddish, sometimes branching stems that emerge from a taproot. At the tiop of stems and branches are flat clusters of small, pale green floral cups that hold inconspicuous male flowers with yellow or white stamens, as well as a single female flower that develops into a protruding 3-lobed seed capsule. Leafy bracts around the flower clusters are soft white at their base, which makes the centers seem to glow. The variously-shaped leaves have irregularly toothed edges and some red spotting. The stalked fruit is a green, three-lobed capsule that hangs downward at first and then becomes erect.

The plant reproduces with seeds spread by birds. It is a somewhat weedy plant with a milky latex sap that irritates mammals' intestinal tracts and mouths.

American Bittersweet

Celastrus scandens

Native woody vine. Photographed on April 4, 2021, wrapped around dead tree branches near the dammed pond in the south-central pasture. They also grow along a draw on the far southeast side.

Bittersweet is a highly adaptable, twining plant that can sprawl along the ground as well as climb up to 25' high on trees. The primary stem is 1" around, and leaves are oval with pointed tips. When the vine is flowering in June, clusters of 1/4" wide, light greenish flowers bloom at the end of branches. Male and female flowers grow on separate plants. Each flower has 5 petals and 5 sepals. Female flowers become round, orange red fruit, that splits into three berry-like bright red arils, each containing several seeds. The plant reseeds itself and also spreads with root suckers..

The nectar and pollen of the flowers are attractive to various ants, bees, and wasps, upland game birds eat the seeds, and some herbivorous mammals, including rabbit, deer, and cattle, consume the foliage. The attractive orange-red seed capsules are sometimes used in decorative arrangements.

Eastern Wahoo

Euonymus atropurpureus

Native shrub or small tree. Photographed on November 3, 2020, along the gravel county road. They are the only example I've seen here.

Eastern wahoo grows over 15 ' tall, with multiple stems and some branching. There is a thin, gray bark on the trunk and larger branches, and branchlets may be striped with a corky tissue. In the spring, loose clusters of 7–15 small flowers with 4 softly triangular, maroon petals grow at leaf axils. The flower is replaced by shiny reddish-purple, 4-lobed capsules. In the fall, each capsule splits open to reveal 4 fleshy red fruits. and the ovate-shaped leaves, up to 4" long, turn red or yellow.

In this mid-autumn image, leaves have fallen off the shrub and all that remains are the 4 red fruits, each with 2 seeds. The flowers are attractive to various small bees and flies, and moth caterpillars eat the foliage. A limited number of birds consume the fruit and spread the seeds. All parts of the plant are toxic to humans.

Ten-petal mentzelia

Mentzelia decapetala

Native biennial or short-lived perennial. Photographed on August 27, 2013, on the dry clay and gravel slope above the county road. It also grows on a steep clay bluff on the southeast side.

Ten-petal metzelia is an attractive plant that grows up to 3' tall from a deep taproot, with one or more thick, erect stems branching toward the top of the central stem. The 3–5" wide fragrant flowers open in the late afternoon and close before dawn. Clusters of flowers grow at the tips of branches, each has leafy bracts surrounding 5 pointed sepals and 10 creamy white petals that are pointed at each end and wider in the middle. In the center of each flower is a column of 200–300 bright yellow stamen. Rough, pointed leaves have sharp, wavy lobes. Seeds are spread by the wind or animal fur.

This plant is also called "ten-petal blazing star" and "gumbo lily." Lewis and Clark collected an example in Dakota County, Nebraska in August, 1804. Ten-petal metzelia tends to grow in selenium-rich soils and can be poisonous. Night-flying moths are the primary pollinators.

American Burnweed

Erechtites hieraciifolius

Native annual. Photographed on August 11, 2017, in a small colony along the river bankwhere fallen cottonwood trees had been burned.

American burnweed grows up to 8' tall on thick, erect stems with pale vertical stripes and light hairs above a shallow taproot. Lance-shaped leaves have toothed edges and distict veins. The cylindrical flower heads, which are 1/4" wide and 3/4' long, are made of two sets of bracts with purplish tips surrounding a tube of white disk florets; only the tips of the florets are visible. There are no petals. Bracts open later in the season to release seeds with fluffy white hairs.

It took me a long time to identify this plant— I kept waiting for the buds to bloom, but they never opened. Burnweed is commonly found on disturbed ground and burn sites. Another name for this plant is "pilewort" because it was used medicinally to treat bowel ailments. It can be edible, but is said to have a strong, bitter flavor. The plant is pollinated by wasps and bees.

Aromatic aster

Symphyotrichum oblongifolium

Native perennial. Photographed on September 13, 2019, in a spreading colony on a dry north-central hill. There colonies in other pastures, but they are often hidden among taller grasses.

Aromatic, or fragrant aster, is a late blooming plant that reaches 2' tall on erect, branching stems above fibrous rhizomes that form colonies. The narrow, oblong leaves become smaller and more crowded toward the top of the plant. Dense clusters of flower heads grow from the ends of stems. Each flower head is supported by leaf-like, spreading bracts below compound flowers with 20–35 blue-violet ray florets around a dark yellow center of disk florets, which turn purplish-orange as the plant matures. Lower stems turn woody and remain during the winter.

Bees and butterflies are attracted to the pollen and nectar, and various insects, caterpillars, and larvae eat the foliage. Leaves and flower heads have a light, fragrant aroma when crushed. Mammals may consume the foliage, but it is not particularly nutritious.

Beggar ticks

Bidens frondosa

Native annual. Photographed on August 24, 2017, in a wet meadow on the southeast side. It is not common here.

Beggar ticks is a rangy plant that grows 1–3' tall on an erect, slender, purplish stem from a slender taproot. There is some branching toward the top of the plant. Compound leaves on long stalks have 3–5 lance-shaped leaflets with coarse teeth along the margins. Individual flower heads, which grow on long stalks at the ends of branches, have 5–12 narrow, unevenly sized, leaf-like bracts surrounding a yellow-orange flower head made of multiple disk florets.

The plant spreads by barbed seeds that are carried by the wind or caught on animals' fur. Caterpillars and beetles feed on the foliage and small rodents and birds consume the seeds, but not many pollinators are attracted to the inconspicuous flower. Young leaves and stems are edible in salads, and there a variety of medicinal uses, both in the US, Europe, and Asia, where it is an introduced plant.

Blue lettuce

Lactuca oblongifolia

Native perennial. Photographed on June 29, 2017, along the gravel road. It is not common here.

Blue lettuce grows up to 3' tall on one or more slender, erect stems. The top of the plant ends in loose clusters of stalked flower heads. Each flower head consists of a tube of overlapping green bracts surrounding 19–21 oblong, lavender ray florets, with 5 little teeth at the outer tips. At the base of each ray are a divided blue style and blue stamen that stick out from the white center of the flower. Fluffy seeds are spread by the wind.

Older blue lettuce plants often form multiple stems from underground rhizomes, and it is likely this was a younger plant because it was standing alone. *Lactuca* comes from the Greek word for milk—the stem contains a milky latex that is unpalatable to cattle, but deer and rabbits eat it. Although young leaves are bitter, they can be mixed in salads. The Lakota chewed the milky resin like gum, and they also made a tea from the leaves and stems to treat stomach aches.

Bull thistle

Cirsium vulgare

Naturalized biennial from Eurasia. Photographed on August 25, 2017, in a north-central pasture, and it is scattered in other places.

Bull thistle grows 5' tall on erect, branching stems. In year one there is a flat rosette of leaves above a thick tap root, and in year two, a winged stem, spreading branches, and flowers emerge. Stems and deeply lobed leaves have sharp, yellow-tipped spines. Narrow, spine-tipped bracts forming the base of the flower head hold numerous pinkish-purple disk florets. Seeds have long, white plumes.

This can be a weedy plant, but unlike Canada thistle (*C. arvense*) and musk thistle *(C. nutans)*, it is not classified as a noxious weed in this area. It has high value for wildlife as a pollinator plant for honeybees and butterflies and as a host plant for painted lady butterflies. Songbirds eat the seeds, and finches use the downy seeds for nesting materials. Despite the formidable spines, roots and young leaves are reported to be edible if cooked.

Bur marigold

Bidens cernua

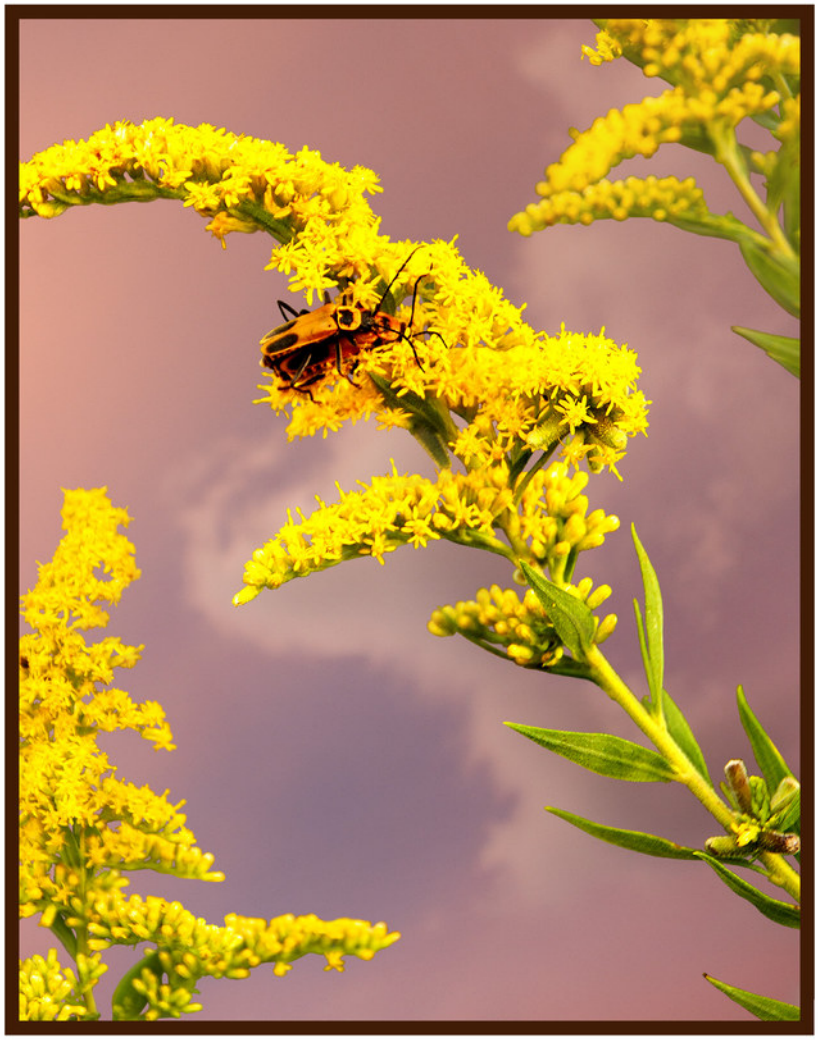
Native annual. Photographed on September 14, 2017, near a creek in a southeast meadow. There were a number of them in this area that year, but I have not found them in other locations.

Bur marigold grows 1–3' tall, with purplish-green stems over a shallow root system. Simple, pointed leaves grasp the stems at their base, and long stalked flower heads grow from leaf axilss. Each flower is comprised of leafy green outer bracts and smaller, yellow inner bracts that support 8 oval, yellow ray florets. In the center are tubular, dark yellow disk florets with 5 lobes. The flower heads tend to face downward as the plant matures. Each fruit has 4 barbs that stick to whatever passes it.

Bees, wasps, and butterflies are attracted to the nectar and pollen of this plant. Long spines on the dark brown seeds stick to animal fur, which spreads them to other areas, and sometimes the stems take root along moist ground. Like beggar's ticks, (*B. frondosa*), bur marigold may have been introduced into other countries for its medicinal properties.

Canada goldenrod

Solidago canadensis



Native perennial. Photographed on October 18, 2016, in a small colony on a southwest hill. Colonies are common in other pastures, especially along draws on the south side.

Canada goldenrod grows 2–5' tall on erect stems above deep, creeping rhizomes that form extensive colonies. Lance-shaped, alternating leaves have sharp teeth on the margins. The stems terminate with plume-shaped, spreading clusters of 1/4" closely spaced stalked flower heads arranged on one side of branches, with 100–1,000 flowers in a cluster. Each small flower has layers of green leafy bracts surrounding 8–15 ray florettes around 3–6 disk florettes.

Cross-breeding is often common among goldenrods, so it can be difficult to differentiate among them. Many bees and other insects cross-pollinate the flowers and others feed on the foliage, and a variety of birds consume the seeds. Contrary to common belief, this and other goldenrods do not affect hayfever, which is caused by wind-pollinated plants, particularly the ragweeds (*Ambrosia spp*).

Canada thistle

Cirsium arvense

Naturalized perennial from Eurasia. Photographed on July 18, 2017, in the south–central hills, Large colonies can be found in all areas, including open pastures, draws, woods, and sandbar.

Canada thistle grows 3–4' tall on erect stems. It spreads by seeds and extensive rhizome systems that send up new shoots to create wide, dense colonies. Deeply lobed leaves have wavy edges and yellow spines along the edges. Clusters of stalked flower heads form at the end of stem branches. Rows of lavender-green, sharp-tipped bracts form a cup that narrows toward the top, with multiple pink-lavender disk florets that develop into seeds with long, white hairs that are carried by the wind.

This is an aggressive, noxious weed that is difficult to control, even with herbicides. I may think I eliminated it from an area, only to find that it continued to grow in an adjacent area because I hadn't killed all of the rhizomes. But it does have uses: bees and butterflies are attracted to the nectar, insects eat the foliage, and some birds, especially finches, eat the seeds and use them to line their nests.

Cocklebur

Xanthium strumarium

Native annual. Photographed on July 28, 2016, on the river sandbar. It also grows along the road.

Cocklebur is a bushy plant that grows up to 4' tall on a purple-streaked stem, with some branching at eaf axils. Floppy, triangular leaves with roughly-toothed edges grow on purplish leaf stalks. Clusters of small, inconspicuous male and female flowers grow separately at leaf axils. Oval, green female flowers have 2 florets with small white hairs and hooked prickles, which later become stiff brown seed capsules with two hooked spines at the tip. The plant is cross-pollinated by wind, and when the pollen has been disbursed, the smaller, round male flowers growing above the female flowers wither.

Cocklebur is common where receding water exposes previously submerged land on the sandbar. When I walk on the sandbar later in the season, the stiff, hooked burs attach themselves to my shoes, clothes, and skin—they really hurt when I pull them off! Cocklebur and burdock spurs were said to be the inspiration for the invention of Velcro in 1941 by George Mestral, a Swiss inventor.

Common burdock

Arctium minus

Naturalized biennial from Eurasia. Photographed on August 25, 2020, in the woods along the river, but it is not abundant there.

This bushy plant can grow up to 5' tall on a reddish, branching stem above a deep taproot. Long leaves on the first-year rosettes resemble rhubarb plants. A flowering stem develops in the second year, with smaller leaves higher on the stem. Clusters of small, globe-shaped rose-purple flowers grow at the ends of stems. Each round flower head has rose-purple disk florets, purple-tipped stamens, and a white style is surrounded by thistle-like bracts tipped with tiny hooked burs.

A variety of bees and butterflies are attracted to the pollen and nectar of common burdock, and it is a food source for painted lady butterflies. The burs stick to animal fur, which helps spread the plant. The roots and seeds have been used in both Western and Eastern medicines, and the roots, stem, and leaves are used in a variety of cuisines around the world.

Common sunflower

Helianthus annuas

Native annual. Photographed on August 10, 2007, along the gravel road, where it is common. It seldom grows in the pastures—perhaps cows eat the young plants before they bloom and set seed.

Common sunflower grows up to 10' tall on an erect thick stem above a taproot. Stems, branches, and leathery leaves are rough to the touch. Large, 6–8" heart-shaped leaves droop downward and usually have toothed margins. Flower heads are made of pointed yellow ray florets encircling tubular brown disk florets and supported at the base by 2 rows of leafy bracts with sharp tips.

One of the joys of late summer is seeing clumps of bright yellow flower heads sunflowers driving along country roads. All parts of the plant were utilized in various ways by American Indians for food and medicine. This is an ancestor of the sunflowers that are cultivated commercially for oil and seeds. Long and short-tongued bees are the primary pollinators and a wide variety of insects use the folliage for food. The abundant seeds are consumed by birds and many mammals.

Compass plant

Silphium laciniatum

Native perennial. Photographed on July 21, 2018, in a southwest pasture. For a number of years, I saw compass plants growing on a neighbor's property along the hilly road, but it wasn't until after the controlled burn in 2018 that I finally saw that some had migrated downhill to grow on our land.

This hardy, long-lived plant grows 6–12' tall, with a taproot that can reach 15' deep. Irregular, leathery, deeply-lobed lower leaves, which grow up to 12' long, have bold yellow veins and margins. Large leaves form a kind of flamboyant skirt at the base and become smaller higher up the stem. Small clusters of stalked flowers grow at the top of the stem and upper leaf axils. Fertile yellow ray florets surround many tubular, yellow disk florets with brown stamen.

The plant was named "compass" because it was believed that the leaves orient themselves in a north-south direction to avoid the heat of the eastern and western sun. Long-tongued bees are the main pollinators, and various insects feed on this plant. Cows and deer also eat them for forage.

Curlycup gumweed

Grindelia squarrosa

Native biennial. Photographed on August 24, 2016, in the north-central pasture. It also grows in other disturbed areas.

Erect stems with many brittle branches grow up to 2' tall from a deep taproot. Oblong leaves have short teeth around the edges and are covered with resinous glands. Around the base of each flower head is a cup of 5–6 rows of green bracts with curving upper tips exuding a gummy resin. Bright yellow ray florets surround a flat, dense center of yellow disk florets. The plant spreads through seeds.

In 1804, M. Lewis collected curlycup gumweed about 10 miles south of Sioux City, Iowa. Plains Tribes used this plant medicinally. Bees are attracted to the nectar and pollen, several beetle species and other insects feed on it, but cows avoid the bitter taste. The image above is somewhat misleading: I photographed the top of the plant and digitally eliminated many of the background leaves and stems, so the plant seems to be floating against the sky. The foliage was actually much denser.

Cutleaf ironplant

Haplopappus spinulosus

Native perennial. Photographed on June 15, 2017, on a dry hill on the southeast side. I've found scattered examples in other dry pastures, but they are not abundant.

This prairie species has highly variable heights, leaf shapes, and amounts of hairiness. The example shown here grows around 20' tall on multiple erect stems emerging from a long, woody taproot. The lacy, deeply-lobed leaves are divided into narrow segments, and each lobe is tipped with a bristle. Flower heads at the tips of branches have overlapping rows of green, bristle-tipped bracts surrounding 15–40 yellow ray florets and a small, rounded center of multiple yellow disk florets. The disk becomes a head of dry, hairy seeds that disperse in the wind.

This plant is named for its tough, wiry stems and woody taproot that make it drought-resistant. M. Lewis collected cutleaf ironplant on September 15, 1804 near Chamberlain, SD. It is a highly variable species that is more common in semi-desert areas west of here.

Daisy fleabane

Erigeron strigosus

Native annual. Photographed on June 20, 2016, in a meadow near the river, and they are scattered in some of the hilly pastures.

Erect, rather spindly stems grow 2–3' tall from a shallow root system, with branching toward the top. Open clusters of stalked flower heads emerge at the tips of branches. From 40–100 short white ray petals (sometimes pale pink or lavendar) surround a dense center of small yellow disk flowers. The narrow leaves with rounded tips become smaller toward the top of the plant. It spreads by seeds.

This plant was named "fleabane" because people believed that putting the dried flower heads in bedding could banish fleas. I had a difficult time identifying this plant. Cross-hybridization among the fleabanes is common, and this one is similar to annual fleabane (*Erigeron annuus*), which has a long hairs along the stem and broader, toothed leaves. Small bees and flies are attracted to the nectar and pollen, and a variety of insects and herbivorous mammals feed on the foliage.

Dotted gayfeather

Liatris punctata

Native perennial. Photographed on September 9, 2017, on a dry south-central hilltop. I've been glad to find this attractive plant becoming more abundant in a few of the south pastures.

Dotted gayfeather grows 6–24" tall from a bulblike corm above a deep, woody taproot that reaches 7–17' deep. Each plant has several stiff, unbranched stems with pink to purple flower heads densely clustered at the tip of each stem. Flowers bloom from the top of the spike to the bottom. Each flower head has flat green-purple bracts at the base, 6–9 star-shaped disk florets, and a long style curving out of the center. Grass-like leaves are 4" long at the base and become smaller toward the top.Small seeds have a tuft of brownish hair is carried in the wind. They also spread laterally through rhizomes.

Another name for this plant is "dotted blazingstar." Plains Indians used the the thick roots to make a variety of medicines. Many butterflies, bees and birds are attracted to the plant, and the foliage is eaten by mammals and small rodents. These are delightful plants to find blooming in the pastures.

Falseboneset

Kuhnia eupatoroide

Native perennial. Photographed on September 11, 2016, on a north-central bluff.

Falseboneset grows up to 3' tall on erect stems above a tough caudex and taproot that can reach 15' deep, making it very drought-resistant. Long, narrow leaves taper at the tip, with a deep central vein. Stems and leaves are generally hairy. Clusters of stalked flower heads grow at the tips of branches toward the top of the plant; each has a cylinder of purplish bracts surrounding 15–30 creamy white tubular florets and a threadlike style projecting from the center. After frost, the flower heads become fluffy globes of hairy, light-brown seeds, and the plant spreads by self-seeding. Over time, the plant becomes bushy, and the stems become reddish brown and woody. It can live over 25 years.

A variety of bees are attracted to the pollen and nectar, and many insects and grasshoppers feed on the foliage. The plant is most noticeable and attractive when the fluffy seed heads are scattered among the fading grasses in the late summer.

Fetid marigold

Dyssodia papposa

Native annual. Photographed on September 4, 2016, in a north-central pasture. It is especially common near gravelly areas.

Fetid marigold is a bushy plant that grows up to 18" tall on an erect reddish-green stem with many branches. Tiny tube-shaped, yellow-orange flower heads, about .25 inches across, grow singly at the tips of stems and leaf axils. The skeleton-like leaves are deeply lobed. Tubular flower heads have, flaring green bracts at the base of 8 yellow ray florets that surround a center of disk florets. Inner bracts are orange to purplish. Both the leaves and the bracts are dotted with orange glands.

Volatile oils and resins produce a strong odor that is somewhat unpleasant, making it unpalatable for livestock. Plains Indians used dried, powered leaves for breathing problems and headaches. Fetid marigold can form mats and become somewhat weedy on disturbed ground. I find that their rusty red color in the fall and winter adds visual interest to the fading colors of the landscape.

Field pussy-toes

Antennaria neglecta

Native perennial. Photographed on April 21, 2017, on a dry southeast hill, and colonies are scattered in other dry areas.

Field pussy-toes grows from 6"–1' tall on thin stalks that are densely covered in long, white hairs. They have a taproot and spread by above-ground creeping stolons that take root at nodes and form matted colonies. Stems emerge from basal rosettes of leaves. Early in the season, leaves are covered in silvery-white hairs that later become greener. Male and female plants are in separate colonies. Clusters of 2–8 flower heads have reddish-green bracts below tiny, yellowish-white tubular flowers. Oval female flower heads have long, fluffy, thread-like styles that have been compared to shaving brushes. Small male flowers have rounder heads with brown stamen sticking out like little antennae.

Patches of pussy-toes are common in the early spring when the grasses are small, and I've spotted greening leaves under melting snow. It is a host plant for painted lady butterflies *(Vanessa cardui)*.

Flodman thistle

Cirsium flodmanii

Native biennial. Photographed on July 18, 2017, in a north-central pasture, where it is common.

Flodman thistle grows up to 3' tall on erect stems covered with white, cobwebby hairs. It spreads by rhizomes and seeds. Lacy, deeply-lobed leaves are tipped with sharp yellow spines. Upper surfaces of the leaves, though covered in hairs, are green, and the lower leaves have a matted white coating. Flower heads at the tips of stems have a vase-shaped base of rows of green bracts with white stripes and small spines. Pinkish-purple disk florets form a kind of crown at the top of the flower, which later become hairy seeds that are dispersed in the wind.

Birds eat the seeds, and some use the fluffy seeds to line their nests, especially American goldfinches. Bumblebees and butterflies visit the flowers, Although Flodman thistle can be weedy, it is not usually aggressive and is considered to be a desirable native thistle. It can be confused with wavy-leaf thistle (*C. undulatum*), but the leaves are greener and the flower heads are smaller.

Fragrant cudweed

Pseudognaphalium obtusifolium

Native annual. Photographed on August 25, 2017, in the meadow along the river.

Fragrant cudweed grows around 2.5' tall on an erect central stem that branches toward the top. At the tips of branches are clusters of small, cream-colored, egg-shaped flower heads with several scale-like layers of papery, cream-colored, petal-like bracts. There are no ray florettes. At the narrow top of the small flower heads are yellowish disk florets. Stems and flower heads are covered in woolly hairs that give the plant a silvery-green appearance. Bristly fruits are spead by the wind.

The day after I took this photograph, I walked by the plant a second time. When I returned about 10 minutes later to take another photo, a nearby cow had eaten most of the plant, and I've never seen it again Cudweed is also called "rabbit tobacco " and "sweet everlasting." The plant has a fragrance like maple syrup. American Indians had medicinal uses for it, especially for breathing problems, colds, and sore throat.

Fringed sagebrush

Artemisia frigida

Native perennial, with a woody base. Photographed on August 21, 2017, on the eroded clay hill above the road. They also growing on a dry, gravelly hill on the southeast side.

Fringed sagebrush is a drought-tolerant plant that grows on multiple stems up to 28" tall. It spreads by seeds and rhizomes that form large clumps over time. Clusters of tiny yellow flower heads are surrounded by woolly, silvery-green bracts that hang face-down along the upper branches. Stems and deeply-lobed, feathery leaves are also silvery-green. Lower leaves have short stalks.

This plant, also called "prairie sagewort," has a pleasant, camphor-like fragrance when the foliage is rubbed, but it is not the same sage used in cooking, in the mint family. Pollen from fringed sagebrush is one cause of hayfever. The Lakota think of it as "women's medicine" and use it in their bath water and for women's issues. M. Lewis found this plant growing near Springflield, SD on September 2, 1804—a few days before the Lewis and Clark Expedition camped upriver from our place.

Giant goldenrod

Solidago gigante

Native perennial. Photographed on September 14, 2016, in a mostly shady, moist ditch along the gravel road. There are some colonies in the pastures.

Giant goldenrod grows up to 7' tall on reddish or light green stems above fibrous rhizomes that form clumps. At the end of the stems are branching clusters of tiny yellow flower heads arranged along one side..The flower heads have both ray and disk florets, with green bracts at their base. Lance-shaped leaves, which narrow at both ends and have toothed edges and three deep, parallel veins, are arranged alternately along the stem. Stems often bend under the weight of the flowers.

Various bees are attracted to the nectar and pollen, goldfinches and other birds feed on the seeds, and insects and herbivorous mammals, including deer and rabbits, eat the foliage. Most sources identify giant goldenrod as the state flower of Nebraska. Varieties of goldenrod hybridize and can be difficult to distinguish; I sometimes confuse giant goldenrod with Canada goldenrod *(S. canadensis)*.

Giant ragweed

Ambrosia trifida

Native annual. Photographed on August 14, 2019, in a wet draw in a northwest pasture. It did not return in this place, but it sometimes appears in other disturbed locations.

Giant ragweed is a weedy plant can reach up to 12' tall on an erect central stem with some branching. Variably-shaped leaves can be up to 12" long, with 3–5 deep lobes on the large leaves, which resemble palms of hands. The central stems and branches, which are covered in small white hairs, end in cylindrical spikes of flowers. Clusters of greeenish-yellow male flowers on short stalks hang downward, with inconspicuous female flowers below them on the same spike.

Giant ragweed is pollinated by wind, and it is a major cause of hay fever. This plant also has a variety of medicinal and practical uses; a list of plants used in the Lakota culture states that the "leaves are rough like a cat's tongue and were used as toilet paper." Insects feed on the foliage, which often attracts birds, which then feed on the insects. Some birds eat the seeds, but they have a hard coating.

Goat's beard

Tragopogon dubius

Naturalized annual or biennial from Europe. Photographed along the road on July 26, 2016, but it blooms as early as June. It is found scattered in many areas in the hilly pastures.

Goat's beard, also called "Western salsify," grows up to 3' tall on erect stems that have a milky juice. It has a long, thick taproot. A rosette of narrow basal leaves grows in the first year. In the second year, sharp-tipped, grass-like leaves clasp the stem and yellow flower heads bloom at the tips of hollow stems that are thicker at the top than the bottom. Long, blueish-green buds, swollen at the base and tapered at the top, become blossoms with long, pale yellow outer ray florets and shorter inner ray florets, each with a divided style and several black anthers. Light green sepals extend behind the outer ray florets. Later, 3" round, hairy, complexly-patterned seed heads glitter in the sun.

Goat's beard flowers usually open only on sunny mornings and close in the afternoon. This portrait is somewhat misleading because the plant is layered on a photograph of a cloudy sky, not a sunny one.

Hairy goldenaster

Heterotheca villosa

Native perennial. Photographed on June 26, 2017, on the sandbar—the only time I've seen it.

Hairy goldenaster is a drought-resistant plant that grows up to 2' tall, with multiple branching stems emerging from the base of the plant. It spreads by seeds and rhizomes, often forming clumps. Stalked flowers at stem ends have a cylinder of overlapping rows of bracts that support narrow yellow ray florets around a center of smaller yellow disk florets. Gray-green leaves, stems, and bracts are covered in fine hairs.

Able to survive in hot, dry environments, hairy goldenaster is more common in western Nebraska and beyond. It was a confusing plant to identify because it is a highly variable species. I've also seen it called "false hairy goldenaster." A number of Native American tribes had a medicinal and ceremonial uses for the hairy goldenaster. Bees and butterflies, including monarchs and painted ladies, are attracted to the nectar.

Heath aster

Symphyotrichum ericoides

Native perennial. Photographed on September 17, 2014, in the north-central pasture. It is spreading in many of the south pastures, especially after the controlled burns.

This bushy plant is densely branched toward the top and grows up to 2–3' tall on an extensive system of rhizomes. Narrow, stalkless leaves become smaller toward the ends of stems and often fall off by the time the flowers bloom. The small flower heads have 12 white (sometimes pink) ray florets around a center of numerous orange or purplish disk florets. The stems become woody as the plant matures, and brown heath aster stems are a common sight above the snow in the winter.

In the fall, heath asters are a lovely, white mound of flowers. I took this photograph directly above the plant and digitally removed inner branches, so it doesn't accurately show the slender, branching stems and abundance of small leaves ni the inner structure. Bees, flies, and wasps are attracted to the flowers, and other insects feed on the foliage.

Jerusalem artichoke

Helianthus tuberosus

Native perennial. Photographed on September 1, 2016, along a shady area of the gravel road. It is spreading along the south side of the road, but I've never seen it growing in the hills.

Jerusalem artichoke can grow to about 9' tall, with hairy, rough stems that branch toward the top. Large, tuber-bearing rhizomes form large colonies. Hairy, sharply pointed green bracts form a cup under the composite flowers that eacg have 10–20 sharply tipped yellow ray florets surrounding a center of orange-yellow disk florets . Long, wide leaves have a rough surface and toothed edges.

The name is likely a mispronunciation of the Italian word *girasole*, which means "turning to the sun." Although not related to artichokes, the flavor is said to be similar. The carbohydrate-rich tubers were an important food source for American Indians. They are still cultivated and sold in grocery stores, and websites offer recipes for ways that the Jerusalem artichokes can be eaten raw, grated, boiled, mashed, or roasted. Butterflies, bees, and song birds are attracted to the plant.

Louisiana wormwood

Artemisia ludoviciana

Native perennial. Photographed on July 26, 2015, among smooth brome grass in the south-central hills, and colonies grow in other places in the south pastures.

This drought-resistant, silvery-green plant grows from 2–3' tall on erect stems, with some branching toward the top. It spreads by seeds and rhizomes that form spreading colonies. The greenish-white stems and leaves are covered with woolly, white hairs. Dense clusters of small flower heads form at leaf axils and on long panicles at the ends of stems; each has a hairy bract cup supporting dull yellow disk florets, but there are no ray petals. Lance-shaped leaves are silvery-white on the lower surface and greener on the upper.

Known by several common names including "white sagebrush," it has a pleasant, sage-like aroma when rubbed or burned. It has various culinary, medicinal, and ceremonial uses in Native American cultures. M. Lewis collected this plant in South Dakota on October 1, 1804.

Mare's tail

Conyza canadensis

Native annual. Photographed on July 19, 2017, on the sandbar, but it is also grows everywhere,

This weedy plant grows over 5' tall on erect stout stems covered with stiff hairs. There is some branching toward the top of the stem. Narrow leaves encircle the length of the stem and become smaller toward the top. Panicles of inconspicuous flowers heads at the tips of stems have narrow, vase-like bracts beneath 20-40 white ray florets surrounding a center of yellow disk florets. The flower heads never fully open. Later in the season, panicles of flowers become a large, fuzzy plume of small seeds with brownish-whitish hairs that are disbursed by wind.

Marestail, also called "horseweed," was new to me when I photographed these examples, but it became invasive in the pastures in the summer of 2018, when there was considerable precipitation after a dry year. Although it is native, it can compete with more desirable plants for water. It is becoming a problem in crops, especially as it becomes resistant to herbicides.

Maximilian's sunflower

Helianthus maximiliani

Native perennial. Photographed on September 14, 2016, in dense clumps near the gravel road on the southwest side. They grow in the pasture near the road, but I haven't found them in the hills.

This drought-tolerant plant grows up to 8' tall on rough, erect reddish stems above dense rhizomes that create large colonies. Long, narrow, grayish-green leaves, folded into a V shape in the middle, curve downward from the stem. The leaves and reddish stem are covered in fine hairs. Stalked flower heads grow at the junction of leaf axils and stem tips on the top 1/3 of the plant. The 3" wide flowers have 15–19 yellow ray florets radiating around a darker yellow central disk.

These flowers are a beautiful sight along country roads in the late summer. It is named after German Prince Maximilian of Weid, who found it during a scientific expedition along the Missouri River in 1833/34. Like all sunflowers, this plant is a valuable resource for many kinds of butterflies, insects, birds, and small mammals. Cattle also eat them and may reduce their numbers in the pastures.

Missouri goldenrod

Solidago missouriensis

Native perennial. Photographed on August 8, 2017, on a dry hill on the southeast side, and I've found colonies in other upland pastures.

Around 2' tall, Missouri goldenrod is shorter than Canada goldenrod (*S. canadensis*) and is usually one of the earliest goldenrods to bloom. It spreads by rhizomes and seeds and forms colonies. Reddish stems are smooth and hairless. Stiff, narrow leaves have toothed margins and 3 veins, and they become smaller toward the top of the plant. Numerous flower heads are arranged on one side of arching panicles. Cups of several layers of yellow-green bracts support yellow ray flowers around a center of yellow disk florets. Fruits have tiny white bristles enclosing small seeds spread by the wind.

Although Missouri goldenrod can be invasive, it has not been a problem here. Small bees, flies, and other insects are attracted to the pollen and nectar, and grasshoppers, moth caterpillars, and some birds and small mammals eat the seeds or foliage. Native Americans tribes used it medicinally.

Muskthistle

Carduus nutans

Naturalized biennial or annual from Eurasia. Photographed on June 19, 2017, on a southeast hill. They show up in all of the pastures, in the wooded bottom land, and along the river bank.

Muskthistle reaches up to 10' tall on erect stems growing from a deep, thick taproot. Large rosettes form in the fall, and branching stems and flowers emerge the next year. They can also germinate and flower over one season. Deeply-lobed leaves with spines along the edges become smaller toward the top. Leaf bases extend down stems to form spiny "wings." Flower heads at the ends of long flower stalks are supported by stiff bracts under many pink, 5-lobed disk florets with long styles.

One plant can produce over 120,000 seeds, but, luckily, only 1/3 of them are viable. A noxious weed that degrades the habitat, muskthistles must be controlled through herbicides, biocontrols, or mechanical means. Pollen and nectar are attractive to butterflies, and songbirds eat the seeds and use them for building nests.

Pale purple coneflower

Echinacea pallida

Native perennial. Photographed on June 15, 2017, on a dry southeast hill. This atractive plant is scattered in other hilly areas, but it is not abundant.

This drought-resistant wildflower grows up to 3' tall on several stout, hairy, unbranched stems above a thick taproot. Narrow, pointed leaves grow toward the bottom half of the plant, and leaves and stem are hairy and rough like sandpaper. Single flower heads at the end of the stem have sharp, reddish brown bracts below drooping, petal-like ray florets that surround a dark, orangish-purple, dome-shaped disk.

Long-tongued bees and butterflies visit the plant, caterpillars eat the foliage, and birds eat the seeds. The black seed head often remains through the winter. Pale purple coneflower has been used medicinally by American Indians, and echinacea capsules are sold commercially as an immune-boosting supplement. A similar plant, purple coneflower (*E. purpurea*), blooms a few weeks later.

Panicled aster

Symphyotrichum lanceolatum

Native perennial. Photographed on September 13, 2017, on the sandbar, but it also grows along the road and in a few other moist areas.

Growing up to 5' tall, panicled aster is generally taller and wider than other asters. It spreads by rhizomes, but it doesn't tend to form large colonies. It has slender, erect stems, with some branching toward the top. Clusters of 20 or more flowers grow on branched panicles at the tips of stems and at leaf axils, each with many white ray florets around a yellow center of disk florets that later turns purple. The stems often arch when they are too heavy with flowers. When the lance-shaped leaves die, they turn brown, curl around stems, and remain on the plant.

Panicled aster is less common here than heath aster (*S. ericoides*), which has smaller flowers and leaves. The nectar and pollen are attractive to butterflies, bees, and wasps. Herbivorous mammals eat the foliage. This example was covered by numerous painted lady butterflies *(Vanessa cardui)*.

Perennial sowthistle

Sonchus arvensis

Naturalized perennial from Eurasia. Photographed on August 11, 2017, on the side of the steep river bank, where there are a number of clumps.

Also called "field sowthistle," this plant grows up to 4' tall and spreads by seeds and rhizomes to form colonies. Prickly-edged, lobed leaves become smaller and unlobed toward the top. Loose clusters of dandelion-like flowers grow on slender stalks at the tip of the stems. Flowers have a vase-like structure of overlapping bracts below yellow, blunt-tipped ray florets and a center of yellow disk florets. Although flowers are abundant, only a few bloom at a time, with some becoming seeds heads while others are developing as buds. The fruit consists of dark seeds with long white plumes.

Nectar and pollen attract a variety of bees, flies, and beetles. The foliage, seeds, and stems are consumed by insects as well as some song birds and mammals. A number of websites describe ways that people around the world have used this plant as a nutritious food source.

Philadelphia fleabane

Erigiron philadelphicus

Native biennial. Photographed on May 21, 2017, in the woods along the river. It is not abundant.

Multiple stems grow up to 2.5' tall from a shallow, fibrous root system. The leaves and stems are covered in hairs that are denser toward the bottom. Lance-like leaves, which clasp the stems and have tiny teeth along the edges, become smaller and sparser toward the top of the plant. Clusters of 1" wide flower heads grow on long flower stalks at the end of the stem; each has up to 300 white or pink ray florets, a flat center of yellow disk florets, and a cup-like base of several rows of narrow, light green bracts. The stalks of unopened buds tend to droop downward. Flowers close at night, and the closed buds are pinkish.

Philadelphia fleabane is the earliest fleabane to bloom. Various small bees, flies, and butterflies are attracted to the nectar and pollen, and insects, moth caterpillars, and mammals consume the roots, foliage, or flowers. The plant reseeds itself when conditions are favorable.

Plains sunflower

Helianthus petiolaris

Native annual. Photographed on the sandbar on August 24, 2015, where they are often abundant. I've never seen them in the upland hills here—they are more common in the west.

Plains sunflower grows up to 4' tall on erect stems with many branches above a short taproot. It reseeds itself and often grows in colonies. Stems and bracts are covered with short, stiff hairs. The flowers grow at the top of the plant on long flower stalks. Each flower has 3 rows of sharply pointed green bracts below 12–25 sterile yellow ray florets with 2 deep grooves along their length. In the center are fertile disk florets. An identifying feature is a whitish spot in the center of the purplish-brown disks. The lance-shaped leaves have wavy edges.

Like other sunflowers, plains sunflower is a valuable plant for wildlife. The nectar and pollen are attractive to bees, butterflies, and wasps. A variety of insects, grasshoppers, and mammals feed on all parts of the plant, and songbirds and small mammals eat the seeds.

Prairie coneflower

Ratibida columnifera

Native perennial. Photographed on July 9, 2016, in a hilly southeastern pasture. It is scattered in a few other dry places in the hills, but it is not abundant here.

Multiple erect stems grow up to 3' tall from a deep, woody taproot. Single flower heads on long, leafless flower stalks shoot above the rough leaves on the lower portion of the plant. The compound leaves are divided into 3–7 narrow leaflets. The flower heads are comprised of 4–12 drooping yellow ray florets surrounding an erect, oblong center cone which is covered with disk florets that bloom from the base to the top. The cone starts out gray-green, but turns dark brown later in the season.

This plant is also called "long-headed coneflower" and "Mexican hat." I've only seen yellow flowers here, but there is also a deep maroon variety. The nectar and pollen attract bees and butterflies, and the plant is a food source for a variety of insects, birds, and mammals. It has been used by Native Americans for a variety of medicinal purposes, including treating snake bites and poison ivy.

Prairie ragwort

Packera plattensis

Native biennial. Photographed on May 15, 2017, on a gravelly hilltop on the southeast side.It is also scattered in a few other dry, hilly areas.

Prairie ragwort grows up to 16" tall from a tough caudex and rhizomes that form small colonies. Leaves are oval at the base and become deeply lobed and smaller further up the stem. Long, erect stems, flower stalks, bracts, and leaves are covered in webby hairs that disappear after the plant blooms. Flat-topped clusters of flower heads growing at the ends of stalks have a single row of green bracts below round-tipped, pale yellow ray florets. The orange-yellow, domed center, with 60–70 trumpet-shaped disk florets, becomes a fluffy seedhead after blooming.

This plant is also called "prairie groundsel." The pollen and nectar is attractive to a variety of bees and small flies and butterflies, but it is poisonous for livestock and some other mammals. This drought-tolerant plant blooms before most of the surrounding plants become taller.

Rigid goldenrod

Solidago rigida

Native perennial. Photographed August 4, 2014, in a north-central pasture, and it is becoming quite abundant in many other areas.

Rigid goldenrod, also called "stiff goldenrod," grows up to 3' tall on a stout, erect stem. It spreads by wind-born seeds and deep, fibrous roots that form offshoots. Central stem and leaves are covered in short, bristly hairs. Stiff, leathery, grayish-green leaves are larger at the base and become smaller as they ascend the stem. Flat-topped clusters of golden-yellow flower heads grow on small branches at the top of the central stem; each has 6–8 ray flowers around a center of up to 35 disc flowers.

M. Lewis collected rigid goldenrod in South Dakota on September 12, 1804. This plant is a valuable pollinator for butterflies, bees and flies. It is consumed by insects and mammals when the plants are young, but cattle tend to avoid them. Drought-resistant and tolerant of many kinds of soil, it has long been a prominent prairie plant. In large patches, it can inhibit growth of nearby grasses.

Rough gayfeather

Liatris aspera

Native perennial. Photographed on August 19, 2014, on a dry hilltop in the central pasture. At first I thought it was a rare here, but I've been delighted to find colonies in other pastures.

Rough gayfeather, also called "button gayfeather," grows 2–3' tall on erect, unbranched reddish stems above a bulbous root. Long, narrow leaves become smaller toward the top of the plant. The button-like, 1' round flower heads, loosely arranged along flower spikes, are comprised of rounded light green bracts below 25 to 40 pink-purple disk florets, with a long, curly style projecting from the centers. There are no ray florets. The flower heads bloom from the top down.

Many kinds of long-tongued bees and butterflies visit the plant, and small mammals and livestock eat the foliage and stems. In this image, I digitally moved the left stem a little closer to the blooming plant to make a better composition. M. Lewis collected rough gayfeather in South Dakota on September 12, 1804, five days after they camped near Old Baldy.

Stiff sunflower

Helianthis pauciflоris

Native perennial. Photographed on July 26, 2015, on a dry hill in the south-central pasture.

Stiff sunflower grows on erect stems up to 4' feet tall, and spreads with rhizomes that form colonies. The central root can be 7' long, making the plant very drought-resistant. Large, gray-green, spear-shaped leaves generally grow only on the bottom half of the plant, with a few smaller leaves higher up the stem. Stems and leaves have a sand-papery texture, and the stems turn red as the plant matures. One or a few long-stalked flower heads grow at the end of the stem. Flower heads have 10–25 yellow ray florets around a purplish-yellow center of multiple disk florets. Supporting the heads are several overlapping rows of flattened triangular bracts. The ray florets often twist or fold when the weather is hot and dry.

A variety of bees and butterflies are attracted to the flowers, songbirds eat the seeds, and caterpillars and larvae feed on foliage, as do many mammals. It blooms earlier than most species of sunflowers.

Wavyleaf Thistle

Cirsium undulatum

Native perennial. Photographed on July 2, 2013, in the north-central pasture.

Wavy-leaf thistle grows up to 3' tall on several thick stems emerging from a caudex above a deep taproot. It spreads by seeds and root buds. Wavy edged, deeply-lobed leaves are tipped with yellow spines, and the gray stems and lower leaf surfaces are thickly covered with matted white hairs. Single flower heads grow at the tip of stems. The vase-shaped base of the flower head is covered with rows of bracts with prominent white central ridges and small spines. Long-pink disk florets burst from the top of the vase.

Although stems are usually erect, they also grow laterally, as in this example. Butterflies visit the flowers and songbirds eat the seeds, but there is little forage value for cattle because of the spines. It doesn't tend to be an invasive thistle unless the pasture is over-grazed. Native Americans used raw or cooked roots as a source for food, and roots were made into a medicinal tea.

Western ironweed

Vernonia baldwinii

Native perennial. Photographed on July 22, 2016, in a wet south-central meadow in a lowland area. It grows in both wet and dry locations and is scattered in a few drier pastures.

Western ironweed grows over 5' tall on a tough erect central stem with branches near the top that end in irregular clusters of red-purple flowers. It spreads through seeds and rhizomes that often form clumps. Lance-shaped leaves with toothed edges alternate along the stems. Green-brown bracts surround the base of the flower head, which has many disk florets but no ray florets. The tubular disk florets have 5 spreading lobes and a split style with curved tips.

This drought-resistant plant is often called "Baldwin's ironweed," and a similar species, *V. fasciculata*, is also called "Western ironweed." Blooming flowers can be used as a dye, and leaves and roots can be used in tea. Butterflies and other insects are attracted to the flowers. Western ironweed has a bitter taste that is not grazed by livestock, so it can become weedy.

Western ragweed

Ambrosia psilostachya

Native perennial. Photographed on October 15, 2016, in a north-central pasture, but it grows every in all areas, especially where the ground has been disturbed.

Western ragweed grows from 1–3' tall on slender stiff stems above fibrous roots and rhizomes. Lance-shaped leaves are deeply-lobed. Bead-like clusters of yellow-green male florets hang face-down along racemes at the tip of the central stem and branches, and solitary female florets grow at the base of the clusters or at leaf axils. The bracts, stems, and leaves are covered in short hairs.

This plant spreads through rhizomes and seeds and is abundant in both both upland and lowland pastures. It has allelopathic toxins that can inhibit germination and growth of neighboring plants, and it is a highly adaptive plant that competes with grasses. As with all ragweeds, it is pollinated by wind, not insects, and the air-born pollen is a major cause of hay fever. It is seldom foraged by cattle, but the seeds are a food source for deer and many birds, including Northern bobwhite quail.

White snakeroot

Ageratina altissima

Native perennial. Photographed on August 10, 2014, in a shady area along the gravel road. It is also abundant on slopes in the woods near the river.

White snakeroot grows up to 3' tall on erect stems with multiple branches that end in flat clusters of stalked, button-like flower heads, each with light green, non-overlapping bracts at the base of 10–30 white disk florets. There are no ray florets. Heart-shaped, leathery leaves have toothed edges and 3 prominent veins. It spreads by wind-blown seeds and rhizomes.

Butterflies, wasps, and bees are attracted to the nectar, and moth caterpillars feed on the foliage. White snake root has a poisonous oil that is usually distasteful to cattle, except in times of drought. The poison can be transferred to humans through cow's milk. In pioneer days, "milk sickness" was a serious problem that may have caused the death of Abraham Lincoln's mother. The plant acquired its name because early settlers wrongly believed that the rhizomes could treat snakebite.

Wild lettuce

Lactuca canadensis

Native biennial. Photographed on September 22, 2019, above the river bank.

Wild lettuce is a spindly plant that can grow over 8' tall on erect purplish-green stems, but the one in this example only reached about 3'. There are variable leaf sizes and shapes; larger leaves toward the base have wavy edges and deep lobes, and upper leaves become less lobed and smaller. Most leaves clasp the stem. Stalked flower heads at the tips of the stem and at leaf axils have long tubes of sharply pointed, overlapping bracts surrounding 15–20 bisexual, pale yellow ray florets with split-tipped styles. The flowers fade the same day they open. Tufts of white hair spread the seeds in the wind.

Young leaves and stems can be eaten cooked or raw. The milky juice in the stems and root are said to have sedative properties similar to opium, especially when the plant is flowering, and it has been used medicinally. Small bees are attracted to the pollen and nectar, a variety of moth caterpillars consume the foliage, and some aphids use it as a host plant.

Yarrow

Achillea millefolium

Native perennial. Photographed on June 11, 2021, in a small colony near a thicket of smooth sumac in the southwest pasture, which is the only place I've found it.

Yarrow grows over 2' on erect but weak stems covered with fine hairs and branching toward the top. It spreads by rhizomes. Alternating 3-5" long leaves have feathery leaflets at the midrib that are further divided into tinier leaflets. Leaves have a spicy aroma. Flat clusters of white flowers emerge at the ends of stems, each with 4–6 white ray florets surrounding pale yellow disk florets. Later in the season, the flower heads become brown seed-heads.

When I first saw this plant in late April, 2021, I thought these lacy leaves were ferns growing in a very atypical, sunny location. I went back a few weeks later and found that it was not a fern—white flowers were blooming at the tips of long stems. The nectar and pollen attract a wide range of insects, and other insects feed on the flowers and foliage.

Tamarisk

Tamarix ramosissima

Naturalized deciduous shrub or small tree from Eurasia. Photographed on June 26, 2017, on the north side of the sandbar. There were several smaller tamarisk plants near it.

Tamarisk, also called "salt cedar," grows up to 20' high from a deep taproot and rhizomes. It has reddish brown stems and arching branches with feathery, scaled leaves. New shoots end in dense plumes of small flowers that like little pink beads and then open to become tiny 5-petalled flowers.

When I first started kayaking out to the sandbar, I was drawn to the masses of attractive pink flowers on this strange plant, but it took me several years to identify it. I learned that although it is sometimes sold as an ornamental, it is primarily considered a noxious weed that is invasive and destructive in riparian areas. The seeds may have floated down the river from the Dakotas and taken root on the sandbar. In 2018, I noticed that the tamarisk I had photographed was dead — it's possible that the Army Corps of Engineers had sprayed it, and I haven't seen it again.

Blue vervain

Verbena hastata

Native perennial. Photographed on July 22, 2016, in a wet south-central meadow. It also grows in a few other lowland areas.

Blue vervain grows over 4' tall on one or two erect square stems, with some branching toward the top. It spreads by seeds and a shallow system of rhizomes, and often forms clumps. Stems and branches end in slender 2–6" spikes, with small, purplish-blue flowers spiraling along their length. Each flower has a purple-green tubular calyx supporting 5 spreading lobes that are fused at the bottom. Spikes elongate as they mature, and flowers open from the bottom of the spike to the top, with only a few flowering at one time.

Many kinds of insects are attracted to the nectar and foliage of blue vervain, and various songbirds consume the seeds, but mammals tend to avoid it because of the bitter-tasting leaves. Blue vervain, like others in the vervain family, has been used medically and ceremonially in a number of cultures. Lakota people used the roots and leaves in healing teas, and they also ground the seeds for flour.

Hoary vervain

Verbena stricta

Native, short-lived perennial. Photographed on July 6, 2013, in a north-central pasture, and it is common in a number of places, especially on disturbed ground.

Hoary vervain is a drought-resistant plant that grows up to 4' tall on erect, square stems from a deep taproot. It spreads by self-seeding and tends to form clumps. Stems and rough-toothed leaves are covered in fine white hairs that make the foliage gray-green. Stems and branches terminate in long floral spikes with overlapping flowers that bloom in clusters from the base to the top. Flowers have 5 blue-purple lobes fused at the bottom — the top two lobes are smaller than the bottom.

Although hoary vervain is usually purple, I have seen some with white flowers in the southwest hills. Butterflies are attracted to the nectar, and the seeds are a valuable food source for birds and small mammals. The bitter-tasting leaves are avoided by cattle, so hoary vervain can become overly abundant in disturbed pastures.

Nettle-leaved vervain

Verbena urticifolia

Native annual or biennial. Photographed on August 14, 2019, in the woods near the river. It is found in other woody areas, but it is not abundant.

Nettle-leaved vervain, also called "white vervain," is a gangly plant that grows up to 6' tall on a rigid central stem, with some branching on the upper half. Wrinkled, pointed leaves on thin stalks have rough-toothed edges. Leaves and stems are covered in bristly hairs. The central and side stems end in upward-growing spikes loosely covered with small, white 5-lobed flowers—only a few bloom at once. Spikes get longer as the plant matures. It reseeds itself, but it seldom forms colonies.

When I see this often solitary plant at a distance, it can appear to be an ungainly person frantically waving its arms in the air. It has high value for wildflife: the nectar and pollen attract various bees, flies, and small butterflies; various insect larvae feed on the foliage; and songbirds like sparrows eat and spread the seeds. Like other vervains, the bitter tasting leaves repel mammals.

Prairie Verbena

Verbena bipinnatifada

Native, short-lived perennial. Photographed on July 22, 2016, in a southeast meadow. It is a common plant in many areas of the pasture, especially where there is bare ground.

Prairie verbena is a mound-like plant that is also called "Dakota vervain." It grows about 10" high and forms mats that can be over 2' wide, with multiple stems that spread close to the ground and rise at the tips. Compound leaves covered with stiff hairs are divided by deep lobes that are further divided. Hairy stems and branches end with round clusters of small pink-violet flowers on umbrella-like spikes. Each flower has hairy purplish bracts and five sepals under a tube of 5 flaring lobes, with notched tips and a pale center. Stems elongate and produce new flowers from spring through summer, and they often stay green late late into fall. It is self-seeding, but not usually invasive.

Various nursery websites in the Midwest recommend prairie verbena as a valuable, low-growing, drought-resistant plant for gardens. Long-tongued bees and butterflies are attracted to the nectar.

Prostrate vervain

Verbena bracteata

Native annual. Photographed on July 24, 2016, along the side of the gravel road, where it is common.

Prostrate vervain grows horizontally with multiple stems radiating out from a central taproot. Hairy stems can grow up to 2' long, and they sometimes take root at the nodes, forming mats. Leaves are deeply lobed or toothed and have hairs on both sides. Flower spikes, which elongate over time, grow about 6" long, with hairy, pointed bracts and tiny lavender flowers. A green calyx surrounds the base of each tubular flower, which has 5 petal lobes and a white throat.

This can be a weedy plant on disturbed ground. In this portrait, I have digitally removed most gravel beneath the plant and placed the plant layer on a layer of a sky photo, so the stems seem to be growing upright. Bees and butterflies are attracted to the nectar, and the seeds are a valuable food source for songbirds. It is commonly found in cracks in concrete driveways in cities and suburbs.

Canada violet

Viola canadensis

Native perennial. Photographed on May 5, 2016, on a moist, shady slope in the woods near the river. It is also abundant on the side of a shady bluff above the county road.

Canada violet reaches up to 16" tall. Heart-shaped leaves at the base of the plant have coarsely-toothed edges. Single flowers, growing at leaf axils, have 5 white petals, a yellow patch in the center, and purple streaks on the lower petals. The plants spread from rhizomes that often form large clumps, especially in woody areas, and they also spread through self-seeding.

In this image, a Canada violet is growing among some catchweed bedstraw (*Galium aparine*). Violets are mild tasting but edible in salads and soups, and as flavoring in tea. Teas and poultices have also been used as medicine. Fritillary butterflies, which need violets to survive, lay their eggs near violets in late summer, and the larvae feed on young violet leaves the following spring. The nectar and pollen attract various bees, and some small animals feed on the foliage and seeds.

Common blue violet

Viola sororia

Native perennial. Photographed on May 5, 2016, on a moist, shady slope on the river bottom, but it grows in other areas, including open, sunny pastures.

This small plant, also called "downy blue violet" and other common names, grows up to 8" tall. Heart-shaped, veined leaves and violet flowers emerge on long stalks from the root crown. Shallow rhizomes form large colonies, and they spread by seed. Single flowers at the ends of long stalks have 5 light to darker blue-violet petals. The two side petals have small beards at their base. The base of the lower petals is slightly wider and has purple lines that lead insects to nectar.

Violets can be difficult to identify because they have variable colors and shapes, and they often hybridize. They have been used for medicine and food in a number of cultures, including ancient Rome, and they are still used by herbalists in a variety of ways. This is another violet that fritillary butterflies need for survival; they lay their eggs nearby, and their caterpillars consume the foliage.

Waterpod

Ellisia nyctelea

Native annual. Photographed on May 15, 2017, in the woods along the river, where it is common. It is also found in disturbed, open sunny areas.

Waterpod is an inconspicuous, low-growing (4–16" tall) plant that is often hidden under other plants in the woods. Multiple thick, hollow, branching stems, covered in hairs, emerge from a weak taproot. Hairy, stalked leaves are divided into 7–13 narrow, lobed segments with pointed tips. Flowers grow on small stalks at leaf axils. The 5 points of a hairy, star-shaped green bract are visible behind tiny bell-shaped flowers with 5 white lobes and small purple spots at the tips. There are purple veins running along the length of the flower tube, and 5 stamens project out from the center of the cup

This plant is also called "Aunt Lucy." I digitally removed much of the ground it was on, so the plant seems to be floating against the sky. Various bees and flies are attracted to the pollen or nectar, but the strong odor repels mammals. Some sources now identify this plant as part of the borage family.

Sandbar willow

Salix interior

Native shrub. Photographed on the sandbar on June 17, 2018, where it is plentiful. In the high river flow of the summer of 2019, they grew in the shallow waters of the sandbar.

Thickets of sandbar willow grow up to 8' tall from a woody root system that develops offshoots. Male and female flowers are on separate plants that have spiraling, cylindrical clusters of florets, called catkins. Male catkins have a spray of yellow-stamen, and bottle-shaped female florets develop fruit after pollination by bees and flies. Long, narrow leaves have small teeth around the edges. Young twigs are yellowish green in the first year and reddish-brown in the second. Older stems have gray bark. The shrub also spreads through seeds.

This plant has high value for a wide variety of wildlife. It is pollinated by various bees and flies, and many caterpillars, moths, and other insects feed on the foliage. Birds, in turn, feed on the insects. Beavers eat the branches and leaves and also use them in their dam construction.

Violet wood sorrel

Oxalis violacea

Native perennial. Photographed on June 3, 2017, on a dry southeast hill. It is scattered in other areas in the south pastures and has become an abundant ground cover in some places.

Violet wood sorrel grows up to 6" tall, with multiple slender flower stalks emerging from a shallow underground bulb. Clusters of .5" wide, bell-shaped flowers grow on the ends of the stalk. Each flower has 5 green sepals at the base of 5 violet petals, with a light green surrounding 5 yellow-tipped stamen and 5 shorter ones. Each stalked compound leaf has 3 heart-shaped leaflets. Flowers and leaves close at night and open in sunlight.

This plant is sometimes called "shamrock," and its leaves are similar to some small clover plants. Although the sour, lemony-tasting plant is poisonous if consumed in large amounts, people have found many ways to eat it raw or cooked. Bees, butterflies, and ants are attracted to the flowers, but mammals are repelled by the taste and seldom consume it.

Yellow wood sorrel

Oxalis stricta

Native annual. Photographed on August 8, 2017, along the river bank, where I found several growing inside a rusty old car that was partially submerged in the water—the car had been placed there at least 50 years ago to prevent bank erosion.

Yellow wood sorrel grows around 8" tall, with long, slender stalks above a shallow bulb. Reddish stalks end in clusters of 2–7 bell-shaped flowers with 5 green sepals, 5 yellow petals, 10 stamens, a divided pistil, and light red nectar lines in the center. The seed capsule is shaped like a green banana—when it is mature, it explodes open and can eject the seeds over 36" away. Composite leaves on long stalks have three heart-shaped leaflets, and both the flowers and the leaves fold at night.

Many characteristics of this plant are similar to those of violet wood sorrel. Limited quantities of all parts of the plant can be eaten by humans, and it is known as a thirst-quencher. Small bees and flies are attracted to the pollen and nectar, insects consume the foliage, and birds eat the seeds.

A Few More Thoughts

July 8, 2023. Along with many other people in Boyd County, I was distressed last summer to see the effects of the extreme drought. Fortunately, several feet of snow cover during the winter of 2022-23 and a few fairly good rainfalls in the late spring and early summer of this year helped reduce the drought, and the landscape became gloriously green again. I was glad to see an abundance of wildflowers in the upland pastures, especially on the south side. In April and May I found three species of penstemons, large colonies of scarlet globe mallow, as well as prairie turnip, spiderwort, pussy toes, prairie ragwort, and American vetch. In June, spikes of white yucca flowers dotted the landscape, and I've never seen so many prickly pear cactus in bloom. I also found an abundance of pale purple coneflower and lead plant in new places. But continued rain over the summer is never a certainty, and with the changing climate, the long-term well-being of grasslands, plants, wildlife, and the river can never be taken for granted. Over my years here, I've learned two contradictory things: trust in nature to take care of itself; and always be vigilant for ways that nature can be harmed.

As I finish this book, I am grateful for the time I've been able to walk, listen, work, look, touch, make art, learn, and write about this one place. Living here has made me more mindful of the richness, interdependence, and immediacy of the natural world—a world that for too many years seemed separate and alien to me. Being on this land has also reminded me that the process of learning to see never ends. The natural world teaches me to look more deeply, to find new connections, and to pay attention to both the fine details and the larger patterns of the environment. The natural world teaches me to *care*. I am part the fabric of this place, and it is part of me.

Self-portrait taken from the top of a draw looking toward the opposite side. Northside, September 25, 2022.

Selected Resources

Akta Lakota Museum and Cultural Center. (2023). *Yankton Sioux Tribe.* https://aktalakota.stjo.org/tribal-lands/yankton-reservation/

Archaeological Institute of America. (2023). *Understanding Plains Village Farming Communities at Lynch Nebraska.* https://www.archaeological.org/fieldwork/understanding-plains-village-farming-communities-at-lynch-nebraska/

Barth, R. E., & Ratzlaf, N. S. (2004). *Field Guide to Wildflowers*. Fontenell Nature Association.

Black Elk, L. S., Flying By, W. D., Sr. (1998). *Culturally Important Plants of the Lakota.* Sitting Bull College. https://puc.sd.gov/commission/dockets/HydrocarbonPipeline/2014/HP14-001/testimony/betest.pdf

Chief Standing Bear Project. (2023). *About Chief Standing Bear.* https://chiefstandingbear.org

Colorado's Wildflowers. (2019). https://coloradowildflower.com/

Earl, A. S., & Reveal, J. L. (2003). *Lewis and Clark's Green World: The Expedition and its Plants.* Farcountry Press.

Elpel, T. J. (2021). *1,000+ Wildflower Photos.* http://www.wildflowers-and-weeds.com/Plant_Families/Plant_Families_Index.html

Elpel, T. J. (2013). *Botany in a Day: The Patterns Method of Plant Identification: An Herbal Field Guide to Plant Families of North America*, 6th ed. HOPS Press.

Farrar, J. (1990, January/February). *NEBRASKAland Magazine's A Wildflower Year*, *68*(1). Nebraska Game and Parks.

Farrar, J. (2011). *Field Guide to Wildflowers of Nebraska and the Great Plains* (2nd ed). University of Iowa Press.

Fontenelle Forest. (2019. *Nature Search*. https://ffnaturesearch.org/

Freed, M. L. (1954). *The Lynch Site, 25BD1*. https://core.ac.uk/download/pdf/17230937.pdf

Friends of the Wild Flower Garden. (2019). *Search Site.* https://www.friendsofthewildflowergarden.org/pages/photo_all.html

Haddock, M. J. (2005). *Wildflowers & Grasses of Kansas: A Field Guide.* University of Kansas Press.

Helzer, C. (2010).*The Ecology and Management of Prairies.* University of Iowa Press.

Hilty, J. (2000-2020). *Illinois Wildflowers*. https:/www.illinoiswildflowers.info

Hines, R. (2023). *The Easter Red Cedar*. Gamekeepers Magazine. https://mossyoakgamekeeper.com/wildlife-conservation/wildlife-habitat-management/the-easter-red-cedar/

Hoover, H. T., & Brugier, L. (1988). *The Yankton Sioux.* Chelsea House Publishers.

Johnsgard, P. A. (2014). *Seasons of the Tallgrass Prairie: A Nebraska Year.* Bison Books.

Johnson, J. R. & Larson, G. E. (2007). *Grassland Plants of South Dakota and the Northern Great Plains.* South Dakota State University.

Journals of the Lewis and Clark Expedition Online. *Journals of the Lewis and Clark Expedition.* https://lewisandclarkjournals.unl.edu/item/lc.jrn.1804-09-07#lc.jrn.1804-09-07.04

Kindscher. K (1987). *Edible Wild Plants of the Prairie: An Ethnobotanical Guide.* University of Kansas Press.

Lady Bird Johnson Wildflower Center. (2023). *Find Plants.* https://www.wildflower.org/plants/

Lee, R. O., & Holz, V. V. (2000). *Memories of Sunshine Bottom and Tower.* Privately Published.

Leopold, A. (1949). *A Sand County Almanac.* Oxford University Press.

Oliver, M. (2009). The singular and cheerful life. *Evidence, 71-72.* Beacon Press.

Lewis and Clark Trail. (2023). *Welcome to Old Baldy—the Tower: A National Historical Site*. http://lewisandclarktrail.com/section2/sdcities/FortRandallArea/tower.htm

Minnesota Wildflowers. (2023). *A Field Guide to the Flora of Minnesota.* https://www.minnesotawildflowers

Missouri Botanical Gardens. (2019). *Plant Finder.* http://www.missouribotanicalgarden.org/plantfinder/plantfindersearch.aspx.

National Park Service. (2022). *Missouri National Recreational River. History and Culture*. https://www.nps.gov/mnrr/learn/historyculture/index.htm

Naturally North Idaho. (2013, January 18). *Nature's Seed Dispersal Inspiration for Velcro.* https://www.naturallynorthidaho.com/2013/01/natures-seed-dispersal-inspiration-for.htm

Nebraska Game and Parks. (2022). *Natural Legacy Project*. http://outdoornebraska.gov/naturallegacyproject/

Nebraska Statewide Arboretum. (2023). *Plants and Flowers*. https://plantnebraska.org/resources-events/tips-help-how-to/plants-and-flowers.html

Omaha World Herald. (2022, May 29). *Jon Farrar, 73, spent 42 years documenting the beauty of Nebraska.* https://omaha.com/news/local/obituaries/jon-farrar-73-spent-42-years-documenting-the-beauty-of-nebraska/article_13152383-78f5-5361-8b22-02aa01de51bf.html?mode=nowapp

Patent, D. H. & Munoz, W. (2003). *Plants on the Trail with Lewis and Clark.* Houghten Mifflen Company.

Pell, S. K., & Angell, B. (2016) A Botanist's Vocabulary: *1300 Terms Explained and Illustrated*. Timber Press.

Phillips, H. W. (2003). Plants of the Lewis & Clark Expedition. Mountain Press.

Ponca Tribe of Nebraska. (2023). *History*. https://poncatribe-ne.tv/category/history/

Ratzlaff, N. S,. & Barth, R. E. (2004). *Field Guide to Wildflowers.* Fontenell Nature Association.

Ratzlaff, N. S,. & Barth, R. E. (2007). *Field Guide to Trees, Shrubs, Woody Vines, Grasses, Sedges and Rushes.* Fontenell Nature Association.

Rocky Mountain Biological Laboratory. (2001-2019). *Wildflowers, Ferns, & Trees of Colorado, New Mexico, Arizona, & Utah.* Retrieved from https://www.swcoloradowildflowers.

Sanders, J. (2014). *The Secrets of Wildflowers: A Delightful Feast of Little-Known Facts, Folklore, and History.* Lyons Press.

Santee Sioux Nation. (2023). *The Santee Sioux Tribe of Nebraska: Tanyan Yahipi. https://santeesiouxnation.com/*

Schneider, A. (2023). *Wildflowers, Ferns, & Trees of Colorado, New Mexico, Arizona, & Utah.* https://www.swcoloradowildflowers.com

South Dakota Department of Tribal Relations. (2023). *Yankton Sioux Tribe.* https://sdtribalrelations.sd.gov/tribes/Yankton-Sioux-Tribe.aspx

Streich, A.M. & Todd, K. A. (2014). *Classification and Naming of Plants*. University of Nebraska Extension. https://alec.unl.edu/documents/cde/2017/natural-resources/classification-and-naming-of-plants.pdf

Stubbendieck, J., Friisoe, G. Y., & Bolic, M. R. (1995). *Weeds of Nebraska and the Great Plains* (2nd ed). Nebraska Department of Agriculture.

Thoreau, H. D., Wisner, G. (Ed.). & Moser, B. (Illustrator). (2016). *Thoreau's Wildflowers.* Yale University Press.

Townsend, (K.). *Discover Lewis and Clark.* https://lewis-clark.org/native-nations/siouan-peoples/poncas/

Twedt, C. (1993, January/February). Prairie Shrubs. *NEBRASKAland Magazine's Walk in the Woods, 71*(1), 50-57. Nebraska Game and Parks.

US Army Corps of Engineers Omaha District. (2016, June 16). *Historical Vignette: Fort Randall Dam.* https://www.nwo.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/800549/historical-vignette-fort-randall-dam/

Van Bruggen, T. (2003). *Wildflowers, Grasses and Other Plants of the Northern Plains and Black Hills* (4th ed.). Badlands Natural History Association.

Weaver, J. E. (1954). *North American Prairie.* Johnsen Publishing Company.

Whitmeyer, A. (2010-2017). *Identify that Plant.* http://identifythatplant.com/

Wildflowers of the United States. (2023). *US Wildflower's Database of Wildflowers for Nebraska.* https://uswildflowers.com/wfquery.php?State=NE.

Wildflowers of the United States (2023). *US Wildflower's Database of Wildflowers for South Dakota.* https://uswildflowers.com/wfquery.php?State=SD.

Index of Plant Portraits by Flower Color

white (or very pale shades of other colors)

green/brown

yellow

orange to red

pink to red violet

blue violet to blue