



*Castilleja linariifolia*

# Castilleja

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Above: Green River greenthread, by Charmaine Delmatier

## Green River greenthread (*Thelesperma caespitosum*): the Story of a Southwestern Wyoming Endemic

Charmaine Delmatier (Refsdal)

Of the plethora of botanical wonders that Society members can anticipate seeing at the 2026 WYNPS Annual Meeting in Flaming Gorge, the exceptionally rare Green River greenthread (*Thelesperma caespitosum*) should be of utmost excitement. Green River greenthread is not only a Wyoming state endemic but is localized to southwestern Wyoming within three occurrences ranging less than 20 km<sup>2</sup> worldwide, all of which are threatened by roads and recreation.

A member of the Asteraceae family, Green River greenthread is a perennial that emerges from a stout

tap root at a height of 4-19 cm and is thought by many to be rhizomatous. This is evident at the southern population where plants track along cracks and fissures in rocky shale benches. The entire plant is dark green and mostly glabrous with one or two flowering heads rising above the basal leaves from slender, threadlike stems which have inspired the common name of “greenthread.” Each flowering head is limited to yellow disk flowers with no ray flowers and is surrounded by an involucre with two rows of connate bracts. The outer row is reflexed backwards adding to the unique overall look. What makes this species easier to spot in the field are the clusters of 3-5 terminal leaflets. Although the pinnately compound leaves are similar to one of its look-alikes, fineleaf hymenopappus (*Hymenopappus filifolius*), Green River greenthread has fewer leaves that are not as finely dissected or as hairy.

We now recognize just three known populations within a narrow range in elevation from 6,200 to 6,550 ft. Over the years, with human activity in the immediate vicinity, all three populations are now bisected by one or more roads and recreational trails. In approximately 1966, a population of Green River greenthread was divided into two subpopulations by the construction of Interstate 80. The other two populations are located farther south, on both sides of the Green River. Long and short-term trends remain largely unknown for this species (cont. pg. 4).

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## WYNPS News

**Attention:** There is still time to renew 2026 memberships and register for the 2026 Wyoming Native Plant Society Annual Meeting, 29-31 May, at Flaming Gorge. Register on the WYNPS website or using the form in the March issue of *Castilleja* by **May 19<sup>th</sup>**. We still need donated items for the silent auction to support the Markow scholarship fund. Contact [wynps@wynps.org](mailto:wynps@wynps.org) to donate or with any questions.



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([tetonplants@gmail.com](mailto:tetonplants@gmail.com)). Check the chapter

homepage (<https://tetonplants.org/>) for events.

**Message from the President:** Snow has been falling here in Pinedale for the last week, finally providing some much-needed moisture for what is looking to be a dry and early wildflower season. Meanwhile, I'm looking forward to the WYNPS Annual Meeting and Wildflower Weekend, which will take place in the beautiful southwestern part of our state along the Flaming Gorge near Green River. There is a full lineup of hikes with stunning scenery and wildflower displays, as well as two speakers with in-depth knowledge of the flora of the region. This year also features a unique opportunity to tour a nearby Trona Mine. Thanks so much to all the great behind-the-scenes organizers. WYNPS wouldn't be the same without all the dedicated volunteers that keep it running. I am excited to be a part of it all as your president. -Kelsey Smith

**Scholarship Winners:** Congratulations to the 2026 winners of the Markow Scholarship: Baylee Christensen, University of Wyoming, for *Sustainable Limits of Wild Native Seed Harvest: Linking Field Experiments with Population Viability Modeling*; Kiley Stoj & Sierra Jaeger, University of South Carolina, for *Population demography of the last populations of the Yellowstone sand verbena*; and Rin Kuemerle, Teton Botanical Garden, for pollinator garden improvements. Thank you to all who have contributed to the scholarship fund!

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**New members:** Please welcome the following new members to WYNPS: Mickey Babcock, Wilson; Josephine Friedman, Cody; Gaile Gordon, Jackson

**Treasurer's Report:** Balance as of 27 April:  
Scholarship = \$300; General = \$12,895.88;  
Total = \$13,195.88

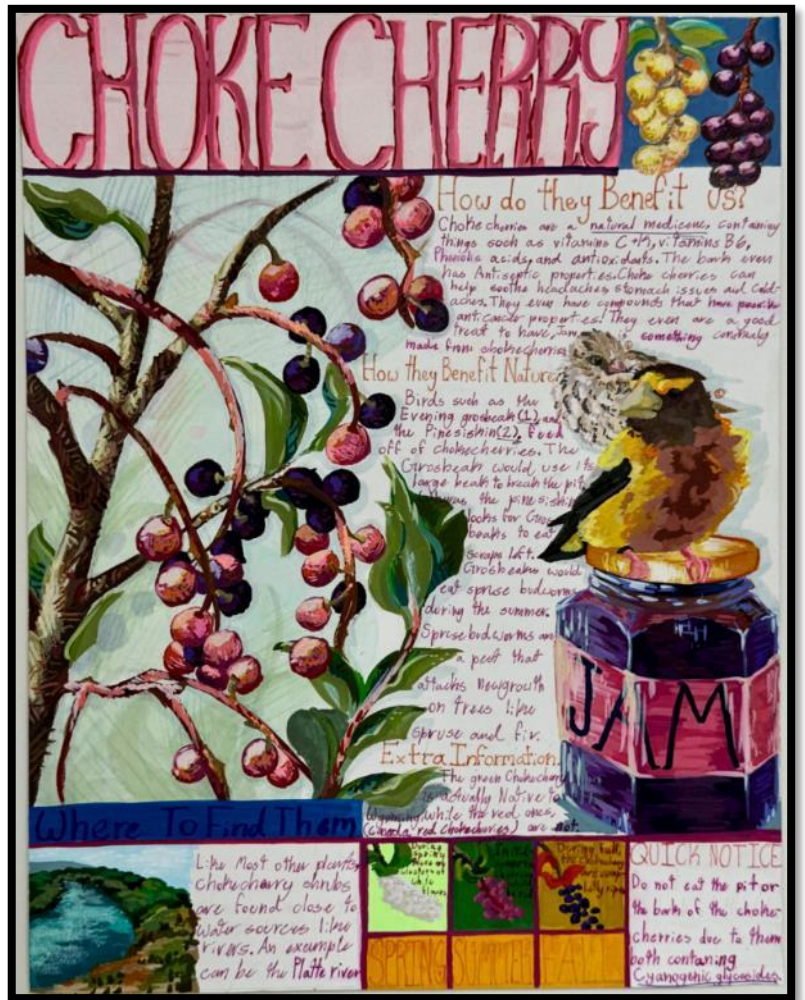
**Looking for WYNPS chapter events or more plant related activities in Wyoming?** Check out our new live calendar at [www.wynps.org/calendar](http://www.wynps.org/calendar) Email the editor @ [swessel1@uwyo.edu](mailto:swessel1@uwyo.edu) if you have an event to feature.

## Native Plant Month Poster Winners

Please join the Wyoming Native Plant Society in congratulating the winners of our 3rd annual poster contest celebrating April 2026 as Wyoming Native Plant Month. The contest, open to all Wyoming 6th-8th graders, invited students to create a poster around the theme: "*Native Plants Benefit People*", highlighting the many essential roles that plants play in human lives.

Each winning student, along with their respective teacher, will receive \$250 and the winning posters will be displayed across Wyoming public libraries from June through January. After reviewing many beautiful and creative submissions from students across the state, these three winners have been selected:

- Isadora Clark (8th grade) from Pinedale Middle School, and her teacher, Kandase Youtz
- Naomi Vreeman (7th grade) from Casper Christian School, and her teacher, Jody Scott
- Laney Hugo (6th grade) from Stocktrail Elementary, and her teacher, Amanda Bailey



Above: A 2026 winning poster on Chokecherry by Isadora Clark of Pinedale Middle School.

Honorable Mentions were also awarded to four other students, reflecting the high level of creativity and engagement in this year's contest. These students, who will receive certificates, are:

- Tylie Maughan (7th grade) from Hanna Elementary School and her teacher, Kaitlyn Larson
- Kenzie Blair (8th grade) from Greybull Middle School, and her teacher, Michelle Stebner
- Indiana Moon (8th grade) from Douglas Middle School, and her teacher Emily Jensen
- Chloe Shadden (8th grade) from Douglas Middle School, and her teacher Emily Jensen

The Wyoming Native Plant Society thanks all participants for contributing their talent to highlight the importance of native plants to ecosystems and people and looks forward to next year's contest. To view all the posters, please visit our website at <http://www.wynps.org/events/>.

Want to help find Wyoming's "Most Wanted" rare plants?

**iNaturalist**

**Join the Wyoming Rare Plant Hunt Project on iNaturalist to learn more**  
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## Conservation Corner - Part 2

### **Setting the Stage for Cheatgrass Control**

Bonnie Heidel, Conservation Committee

Cheatgrass (*Bromus tectorum*) is a widespread conservation issue impacting native plants across Wyoming and all other natural resources that depend on them. As this newsletter goes to press, cheatgrass is already going to seed in the very early spring of 2026.

Here are four hopeful signs:

- Early intervention controls of cheatgrass are successful in parts of the state (Sublette County [https://www.wlfw.org/wp-content/uploads/2024/05/Sublette-County-Booklet\\_FINAL.pdf](https://www.wlfw.org/wp-content/uploads/2024/05/Sublette-County-Booklet_FINAL.pdf)).
- Emergency response control measures were launched in 2024 as wildfire recovery grants.
- The BLM approved and secured permits for Indaziflam (“Rejuvra”) use in 2024 on BLM lands. Federal agency weed control funding was earmarked in the Inflation Reduction Act and Infrastructure Investment and Jobs Act.
- The State Legislature approved \$36,000,000 for cheatgrass control on state and private lands in 2027-2028.

When on public lands, apply Play Clean Go practices (<https://playcleango.org>). Cheatgrass moves into greenspaces in town and into yards, but the seeds from greenspaces and yards also move back into public land areas, so it is also important for constituents to control invasive species even in town and eliminate that seed source.

There is a Wyoming cheatgrass handbook, and information on a couple other invasive annual grass newcomers.

Visit: <https://www.invasivegrasses.com/resources>

### Green River greenthread- Continued from p. 1:

But before these modern anthropogenic impacts even began, an interesting story of interactions between the unique geology and human interest in the landscape has influenced this higher elevation semi-barren cold desert ecosystem throughout Wyoming’s history. The distinct geology of southwestern

Wyoming, on the eastern edge of the Great Basin desert, reveals a significant natural landscape characterized by eroded stratified pillars in shades of red, white, and yellow that are visible for miles. Deposited from Eocene Lake Gosiute around 50 million years ago, these calcareous ancient lakebed layers have long intrigued geologists as they were witnessed during explorations dating back to the Hayden Expedition of 1871.



Top: North and South I-80 populations of Green River greenthread; Bottom: Flaming Gorge NRA site by C. Delmatier.

Led by Ferdinand Vandever Hayden, a notable Civil War geologist and physician, the Hayden expedition contributed to the recognition of Yellowstone as the first National Park and later aimed to identify an intercontinental route connecting eastern and western rail systems. As a result, the city of Green River now serves as a key hub within the national railroad network and much of the surrounding area is federally managed land. Important results generated by William Henry Jackson (photographer) and Thomas Moran (painter) are still notable today. Documenting key landforms on this historical expedition, Moran sketched key geological features and then later created works of art to honor the unique beauty of the landscape. Art enthusiasts will be excited to learn that the setting for a known population of Green River greenthread and

its associated habitat are depicted in the foreground of his Castle Rock painting of the Green River!

As much as these colorful calcareous soils have



Above: Castle Rock by Thomas Moran

intrigued explorers, they have also shaped the plant life of the region. Cushion plants dominate these semi-barren areas in much of southwest Wyoming. Some of the more common associates include Hooker's sandwort (*Eremogone hookeri*), thrifty goldenweed (*Stenotus armerioides*), stemless goldenweed (*Stenotus acualis*), tufted cryptantha (*Cryptantha caespitosa*), shortstem wild-buckwheat (*Eriogonum brevicaule*), Hood's phlox (*Phlox hoodii*) and moss phlox (*Phlox muscoides*). However, there are some intriguing and not-so-common cushion plants that might present themselves during our field trip to see Green River greenthread, including matted prickly-phlox (*Leptodactylon caespitosum*), pygmy bladderpod (*Physaria parvula*), fullstem (*Chamaechaenactis scaposa*), and, if we're lucky, tufted twinpod (*Physaria condensata*).

Green river greenthread was not recognized as a Wyoming endemic species when I collected it as part of my floristic thesis and Walter Fertig (Wyoming Natural Diversity Database; WYNDD) was conducting systematic surveys to map it (Refsdal 1996; Fertig 1999). The taxonomy has been an evolution of thought and study that has now led to its confirmation as a separate entity and independent taxon from Utah populations of a close relative (see inset). Green River greenthread rarity will be highlighted at our annual meeting including results of recent surveys. Currently

### "New" State Endemics

Bonnie Heidel, WYNDD (ret.)

*Green River greenthread was discovered and described by Robert Dorn (1990) as a species of both Wyoming and Utah. Since that time, there have been bouts of taxonomic teeth gnashing that lumped it into a more widespread species or demoted it to a variety of hairy greenthread (*Thelesperma pubescens*). Stanley Welsh and Duane Atwood had the last word by describing its Utah kin as a separate new variety of *T. subnudum* in the 2008 Utah flora, leaving both Green River greenthread, and the related hairy greenthread, entirely to Wyoming.*

it has a G1/S1 conservation rank and is considered to be critically imperiled both globally and in Wyoming by WYNDD. Join us in May to witness this unique Wyoming plant along with its picturesque habitat that has been the muse of artists and engineers alike.

#### References:

- Refsdal, C. H. 1996. A general floristic inventory of southwest Wyoming and adjacent northeast Utah, 1994-1995. Unpublished report prepared for the Bureau of Land Management and U.S. Forest Service Region 4 by the Rocky Mountain Herbarium, University of Wyoming, Laramie, WY.
- Fertig, W. 1999. Updated status report on Green River greenthread (*Thelesperma caespitosum*) in southwestern Wyoming. Unpublished report prepared for the Bureau of Land Management by the Wyoming Natural Diversity Database, Laramie, WY.

### **New Alpine Discoveries in the Bighorn National Forest**

Dan Coles, 2025 Markow Scholarship Winner

The alpine flora of Bighorn National Forest is a distinctive and a lesser-known component of Wyoming's flora. Isolated from the central Rocky Mountain chain, the high elevations of the Cloud Peak Wilderness support a unique assemblage of plants shaped by persistent snow, an exposed granitic core, shallow and cold (cryic) soils, and a short growing season. Because such alpine habitats are remote and difficult to access, they remain comparatively underexplored and undercollected, and inventory work in these settings continues to yield important discoveries.

Supported by the Wyoming Native Plant Society Markow Scholarship and in conjunction with a broader inventory effort by Ben Legler, the Rocky Mountain Herbarium Curator; along with Bonnie Heidel, retired WYNDD botanist; undergraduate field assistant Austin Akers, and I conducted alpine peak surveys in the Cloud Peak Wilderness from 2023 to 2025 to address one of Wyoming's last major botanical knowledge gaps. We documented plant diversity on exposed summit ridges, talus slopes, snowbed habitats, and alpine turf; leading to the discovery of alpine disjuncts not previously known from the region that include four graminoids and one forb ranked and listed as Species of Concern by the Wyoming Natural Diversity Database (WYNDD).

These five newly documented rare plant species bring the number of rare plants known on the forest to a total of 71, highlighting both the conservation significance of the forest's alpine habitats and the value of targeted floristic work in isolated mountain systems such as the Bighorn Mountains to refine species distributions. In the Cloud Peak Wilderness, alpine habitats function as cold refugia, where species may occur as alpine disjuncts otherwise known only from the Beartooth and Wind River Ranges in Wyoming. Such species can be found in scattered populations tied to specific substrates, moisture regimes, and late-persisting snowbeds. Presented below are brief accounts of these new discoveries,



Above: Arctic cottongrass by Bonnie Heidel

including summaries of overall species distributions, occurrences in Bighorn National Forest, and conservation statuses.

1. Arctic cottongrass (*Eriophorum callitrix*): a densely tufted, non-rhizomatous perennial graminoid that occurs from Alaska to Greenland, and across Canada from British Columbia to Newfoundland, and south to Montana. In Wyoming, this species was previously known only from the Beartooth and Wind River Ranges. During fieldwork in the summer of 2025, a new population was documented in headwaters of South Piney Creek. The population occurred in a gently sloping wetland complex, likely fed by groundwater upwelling, where peat graded into alpine turf and dry meadows. Within this habitat, the species was locally common. Common associates included mountain sedge (*Carex scopulorum*) and low-lying diamondleaf willow (*Salix planifolia*). WYNDD ranks Arctic cottongrass as S1, critically imperiled in Wyoming.
2. Low northern sedge (*Carex concinna*): a low-growing graminoid that occurs from Alaska to Newfoundland, south to Oregon, Colorado, South Dakota, and Michigan. In Wyoming, this species was previously known only from the Absaroka and Wind River Ranges, the Wyoming portion of the Black Hills, and the Yellowstone Plateau. During fieldwork in the summer of 2024, a new population was documented on the north facing slope of Cedar Mountain, bordered upslope by Engelmann spruce (*Picea engelmannii*) forest. The population occurred on vegetated limestone scree and ledges with moist soil, where the species was local but relatively uncommon. Common associates included Hooker's mountain-avens (*Dryas hookeriana*), timberline willow (*Salix rotundifolia*), and smallflowered anemone (*Anemone parviflora*). WYNDD ranks low northern sedge as S1, critically imperiled in Wyoming.
3. White cottongrass (*Eriophorum scheuchzeri*): a perennial graminoid with long creeping rhizomes and non-tufted culms that occurs from Alaska to Greenland, across Canada, and south into Montana and Utah. In Wyoming, this species was previously known only from the

Absaroka and Wind River Ranges. During fieldwork in the summer of 2024, a new population was documented near the center of Exit Pass. The population occurred in a large alpine wetland within windswept alpine tundra, occupying a gentle bowl along a ridgeline where it was locally common in shallow water depressions. Common associates include sedges (*Carex* spp.) and scattered clumps of low-lying willows (*Salix* spp.). WYNDD ranks White cottongrass as S2, imperiled in Wyoming.

4. Icegrass (*Phippsia algida*): a low-growing, densely tufted annual graminoid that occurs from Alaska to Greenland, south across much of northern Canada, and is widely disjunct in the Rocky Mountains to Colorado. In Wyoming, this species was previously known only from the Beartooth and Wind River Ranges. During fieldwork in the summer of 2025, six new populations were documented. Four populations were documented in the Darton Peak locality, one population documented on a ridgeline just north of unnamed peak 12645, and one on the southwest side of an unnamed pass just west of Lake Angeline. All six populations occurred in similar habitats, either below the base of persistent snowpacks or in wet, flowing seeps.



Above: Icegrass by Ben Legler



Above: Distribution of Arctic cinquefoil in Wyoming represents a disjunct pattern common to several of the new rare alpine Bighorn discoveries. By Dan Coles.

Soils in these habitats are often silty with fine gravel and were often situated alpine avens (*Geum rossii*), alpine mountainsorrel (*Oxyria digyna*), and various sedges and mosses. WYNDD ranks icegrass as S1, critically imperiled in Wyoming.

5. Arctic cinquefoil (*Potentilla hyparctica* var. *elatior*) is a tufted perennial herb in the rose family (Rosaceae) that occurs from Alaska and the Yukon south to British Columbia and Alberta, and east to Labrador. In Wyoming, this species was previously known only from the northern Wind River Range. During fieldwork in the summers of 2024 and 2025, two new populations were documented: one at the base of cliffs on the southeast side of Gunboat Lake, and a second on a ridgeline northwest of Panorama Point. Both populations occurred in similar habitats consisting of cold, mossy seeps on rocky talus slopes. Associated species include sticky polemonium (*Polemonium viscosum*), Parry's primrose (*Primula parryi*), and tufted hairgrass (*Deschampsia cespitosa* ssp. *cespitosa*). WYNDD ranks Arctic cinquefoil as S1, critically imperiled in Wyoming.

(Editor's note: Dan Coles is completing his master's degree in botany at the University of Wyoming.)

## Ethnobotany - Part 18

### Pinyon pine (*Pinus edulis*)

Meredith Taylor, Certified Wyoming Naturalist

Pinyon is a slow growing, drought tolerant, long-lived pine tree (Pinaceae family) found from foothills to montane areas (4,000-7,000 ft) throughout southwestern North America from Wyoming to Mexico. It grows 10-30 ft tall and has a rounded profile. Pinyon needles are 1.5-3" (1-4 cm), blue-green, and bundled in fascicles of 2 or less commonly 1-3. The cones are small and rounded with two seeds per scale, and take two years to mature. Native to North America, the Pinyon reproduces by seed germination from female cones wind pollinated by male cone pollen. Pinyon trees typically live 300-500 years with some exceeding 1000 years.

In Wyoming, trees are found in Sweetwater County south of Rock Springs, at the most northern edge of their range. They often grow in association with juniper trees (*Juniperus* spp.) in the Pinyon-Juniper community that is popular with Pinyon jays, Clark's nutcrackers, elk, moose, deer, pronghorn and bears.

Though a different species than commercially marketed pine nuts, Pinyon nuts are edible as a delicious treat high in fat and protein that were used by traditional Shoshone and Paiute tribes. This author gathers the Pinyon nuts in September and October to eat as a healthy snack or to make pesto with arugula, basil and olive oil. They are gathered by picking them up off the ground if they have fallen, or by laying a tarp down under the tree and shaking the tree gently to catch the ripe pine nuts. This harvest method does not harm the tree and allows pine nuts to be gathered sustainably. Fresh pine nuts are planted inadvertently by wildlife such as Clark's nutcrackers and bears. Pinyon trees have a mast year of high yield only every 3-7 years and not usually in a drought year.

Lewis and Clark are reported to have eaten pine nuts introduced to them by the Nez Perce tribe on their return journey of the Corps of Discovery in 1806. This author's Ethnobotany students are excited to discover and try the pine nuts while exploring the habitat.

Pinyon pitch is also an important medicinal that the author gathers to make a drawing salve called Trementina, a traditional New Mexican remedy for splinters, boils and other skin ailments. In addition,

pinyon pine needles are an excellent source of vitamins A and C when used as tea. The needles are steeped in boiling water to serve as a light, refreshing drink. This tea has more vitamin C than citrus juice.



Above: Pinyon pine tree and cone. Main photo by Meredith Taylor, Inset by Ben Legler.

#### References:

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- Moerman, Daniel E. 2000. *Native American Ethnobotany*, Timber Press, Portland, OR.
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- Purcell, JJ. 2015. *The Herbal Apothecary*, Timber Press, Portland, OR.

\*\*\*\*\*  
*This article is for educational purposes and does not condone collecting of plants that readers can't identify with certainty or dose correctly. The ethics of wild plant collecting is to tread softly through the plant's habitat and only pick the occasional leaf or flower to protect plant sustainability. Check directly with the managing agency about their policies if you want to harvest native plants on public land.*

## Inhabitants of a Hot World

Robert Pal, Montana Technological University



Above: Geothermal features in Norris Geyser Basin by Robert Pal

Montana holds only a small sliver of Yellowstone National Park, yet our state enjoys perhaps the best access to this extraordinary landscape, one that draws millions of visitors each year. When most of us visit Yellowstone, our attention is captured by the steaming geysers, bubbling mud pots, and vividly colored hot springs that make the park famous. Far fewer people, however, pause to notice the living organisms quietly persisting in and around these geothermal features.

Most research in Yellowstone's geothermal areas has focused on microbial life, and for good reason, these systems host some of the most remarkable extremophiles on Earth. Surprisingly little attention, however, has been given to the vascular plants that grow at the margins of this hot world, where boiling water, acidic soils, and unstable ground create some of the harshest growing conditions on Earth.

To better understand what shapes these plant communities, we conducted botanical surveys within a 3.2-meter (10.5-foot) radius of 101 hot springs across 20 hydrothermal areas (geyser basins) in Yellowstone National Park. What we found was a flora both great in number and extraordinary in resilience. Across all sites, we recorded 107 vascular plant species: 88 native and 19 exotic. Alongside these, we documented six lichen species, seven moss species, and one green alga associated with biological soil crusts.

The most frequently encountered plants were tapered rosette grass (*Dichanthelium acuminatum*) and rough bentgrass (*Agrostis scabra*), each occurring in more than a quarter of all surveyed plots. Where vegetation was abundant, it was overwhelmingly dominated by graminoids (grass-like plants).

Yellow spikerush (*Eleocharis flavescens* var. *thermalis*) reached an average cover of 41% in the plots where it occurred, followed by common threesquare (*Schoenoplectus pungens*, 26%) and Nebraska sedge (*Carex nebrascensis*, 22%). Among the forbs, Eaton's aster (*Symphyotrichum eatonii*), cottonbatting plant (*Pseudognaphalium stramineum*), and seep monkeyflower (*Mimulus guttatus*) were the most encountered.

As one might expect, species richness increased with distance from the hot spring edge. Yet hot spring temperature did not explain this pattern. Instead, soil pH emerged as the strongest factor shaping plant communities around the springs. Soil compaction, tied to both hydrothermal processes, also played an important role by limiting overall vegetation cover.

During our surveys, we encountered several striking examples of plants pushing the limits of tolerance. Yellow spikerush was found in plots where



Above: Yellow spikerush growing at the edge of "boiling" water. Visible bubbles often reflect gas emissions, such as carbon dioxide (CO<sub>2</sub>). By Robert Pal.

average soil temperatures exceeded 60 °C (140 °F). Seaside arrowgrass (*Triglochin maritima*) persisted in soils with a pH as high as 10.3, while rough bentgrass survived in extremely acidic soils with a pH of just 1.62. These observations underscore how steep, small-scale environmental gradients, sometimes spanning just a few steps can exert powerful controls on which species survive and where. Taken together, our findings reveal that plant life around Yellowstone's hot springs is structured by a hierarchy of constraints, with soil chemistry, especially pH standing out as the dominant force shaping vascular plant diversity.

So next time you visit Yellowstone, look beyond the spectacle of geysers and the dazzling colors of the hot springs themselves. Take a moment to notice the plants at their edges, quietly enduring heat, acidity, and instability. These modest patches of green tell a story of survival at the very limits of what plant life can tolerate.

(Editor's Note: Reprinted with permission from *Kelsey*; Vol. 39 (2), Winter 2026)

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In addition to the statewide organization, we have two chapters. Membership in chapters is optional; chapter members must also be members of the statewide organization.

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