

Treasures in the Mountains: Fen Wetlands in Grand Teton and John D. Rockefeller, Jr.

Grand Teton National Park

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November 2025

The towering peaks, crystal lakes, and evergreen forests of Grand Teton National Park (NP) and John D. Rockefeller, Jr. Memorial Parkway draw millions of visitors each year. Many pull over to capture the iconic skyline. Little do they know, tucked beneath an overpass or hidden behind trees, lies one of the rarest ecosystems in the Rocky Mountain region—a fen.

Visits in 2024

Grand Teton NP: **3,628,222**

John D. Rockefeller, Jr. Memorial Parkway: **1,459,804** ([STATS – Park Reports](#))



Fen underneath an overpass in Grand Teton National Park.

Photo courtesy of Joanna Lemly, CHHP

What are Fens?

Fens are groundwater-fed, peat-accumulating wetlands. Peat forms when the buildup of dead plant material like mosses, shrubs, and sedges is greater than the decomposition rate. This partially decomposed organic matter at the soil surface is peat. In fens, over half of the top 80 cm of soil is peat. Constantly saturated with cool groundwater, fens in the Rocky Mountains are a refuge for species common in the northern part of the range, supporting communities of rare and specialized plants.

Within the Rocky Mountains, fens are small, and peat can accumulate as slowly as 20 cm every 1,000 years. This means that, since the founding of the United States, these fens have gained less than 5 cm of peat. Fens regulate local water flow and are some of the most effective carbon sinks in the world, absorbing more carbon dioxide than they release. **When these fens are damaged or destroyed, the loss is irreversible.**

Fens in Grand Teton and John D. Rockefeller, Jr.

Despite their ecological importance, Grand Teton NP and John D. Rockefeller, Jr. Memorial Parkway had little information about the fens within their boundaries. From late 2022 to early 2024, the NPS [Inventory and Monitoring Program](#) worked with the Colorado Natural Heritage Program (CNHP) at Colorado State University to investigate the location and health of fens in the parks and catalogue the plants that inhabit them.



The fen inventory field crew: Lauren Laughlin, Calea Cruz, Grant Musgrave, and Kelly Clements (from left to right).

Photo courtesy of Joanna Lemly, CNHP

Mapping Fens

Mapping fens is the first step in protecting these unique habitats. Park managers can best protect fens when they know their locations. It was especially important to document fens near roads, trails, developed areas, and areas where development may occur because these are most at risk of human disturbance. With this knowledge, managers can better anticipate where visitor use or future construction could impact fens and plan accordingly. In addition, park staff can implement best management practices during invasive plant treatments, prioritizing protection of these irreplaceable wetlands.



Researchers crossing a beaver dam during fieldwork.

Photo courtesy of Joanna Lemly, CNHP

The inventory included three main efforts: digital mapping, field sampling, and updating the digital map based on field observations. First, researchers used topographic maps and aerial photos to identify potential fens. Of the 906 potential fens identified, field crews visited 108, prioritizing large areas near trails and roads, and those known to contain rare plants. During the summer of 2023, they visited both parks four times in eight-day stints.

At each site, researchers used a thin metal tool called a soil tile probe to measure peat depth. Areas with more than 40 cm of peat were confirmed to be fens. Researchers did a rapid vegetation survey at every site, looking for rare, fen-indicator plants. In-depth vegetation surveys were conducted at select sites. Back in the lab, the digital maps were updated with the field data and confirmed fen locations.

Rare Plants, Everywhere

In total, field researchers inspected almost half of the area mapped as potential fen. They assessed 2,283 acres, confirming 40 fens and 28 peat-accumulated wetlands. Within these areas, they found 127 populations of 23 rare fen-indicator species. At some sites, these rare Wyoming plants were so prolific that they formed the main ground cover.

Three rare in Wyoming plants observed in more than ten of the confirmed fens:

- Purple marshlocks (*Comarum palustre*)
- Woollyfruit sedge (*Carex lasiocarpa*)
- Buxbaum's sedge (*Carex buxbaumii*)

"I don't necessarily want to say 'common rare plants' because they're rare. But when you see them, sometimes they're just everywhere," said Lauren Laughlin, field lead with CNHP.



*Woollyfruit sedge (*Carex lasiocarpa*), a plant rare in Wyoming, growing lushly in a Grand Teton fen.*

Photo courtesy of Joanna Lemly, CNHP

Small, But Mighty

A thousand acres may sound like a lot, but the 1,016 acres of confirmed fens make up less than 1% of the park. Though small, these fens are mighty! They are in excellent condition, with little evidence of trampling and few non-native species. The number and quality of rare plants they support is truly exceptional. These fens are southern refuges for plant species at the edge of their range, in secret grottos hidden between the steep peaks of the Rockies.

“Grand Teton is known for those beautiful peaks, and they're very, very special. But...there's so much more in all our landscapes and all our national parks. There are these treasures hiding out there and the Tetons is really special when it comes to these particular kinds of fen wetlands,” said Joanna Lemly, principal investigator with CNHP.

Future of the Fens

Now that park managers know where confirmed and potential fens are, they can make informed decisions about visitation and infrastructure changes. Protecting these fens from damage will ensure they continue to provide important habitat for rare plants, store carbon, and regulate local waterways. Additionally, vegetation managers can prioritize areas for invasive plant surveys and treatments in and around these valuable ecosystems.

As a visitor, you can also help preserve fens. When visiting parks, be sure to stay on trail and, if available, use a shoe brush to remove and dispose of invasive seeds before hiking.

So, the next time you are driving through an unassuming landscape, take a closer look! You might see a rare plant, a beautiful bird, or, if you're lucky, a fen.

Want to learn more?

Visit the final project report: [*Inventory of Fens and Rare Fen-Indicator Plant Occurrences at Grand Teton National Park and John D. Rockefeller, Jr. Memorial Parkway*](#)