Missouri River Breaks

Climate Adaptation Plan

Contributors:

TNC: Chris Gordon, Rachel Bush, Alison Long-Nebiolo, Marissa Ahlering, Kristen Blann, Auste Eigirdas, Sage Longtin, Kenny Bielski, Mike Hamel

Partners: ND Parks and Recreation, USDA-ARS Northern Great Plains Research Laboratory

Overview

410 mi² | North Dakota

The Missouri River Breaks conservation area lies between Bismarck-Mandan and Washburn, North Dakota. This rugged landscape features steep, dissected terraces and uplands that descend to the **Missouri River** and its major tributaries. Woody draws, riverbank forests of cottonwood and green ash, and upland mixed-grass prairie provide critical habitat for wildlife. The surrounding Missouri Plateau opens into the wide prairies of the Northern Great Plains, historically home to bison, elk, and pronghorn. Today, the area is a mosaic of grazing lands, cropland, and native grasslands that are home to grassland birds and butterflies.

The primary challenges in the Missouri River Breaks area are the **conversion of grassland** to row crops and residential and energy development, **loss of biodiversity** from invasive grasses and woody encroachment, and stressors to landowners pursuing grass-based livelihoods. **Damming of rivers** and altered water flows have also halted riparian forest regeneration.

Despite development pressures across the northern great plains, **this area remains relatively uncultivated**, with about 50% grassland cover and 6.5% of it protected—making it a high-priority conservation opportunity.

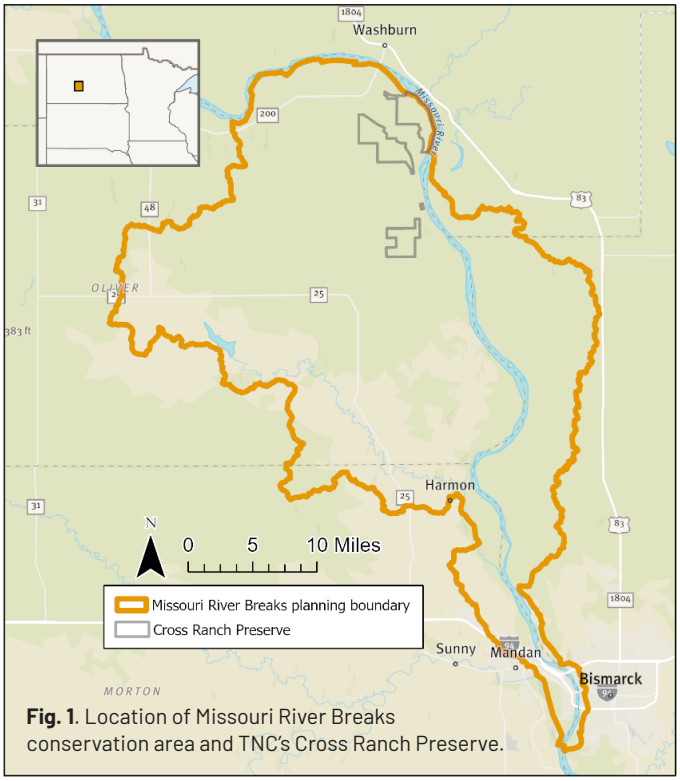

Fig. 1. Location of Missouri River Breaks conservation area and TNC's Cross Ranch Preserve.

Cottonwood

Baird's sparrow

Regal fritillary

Climate Impacts & Projections

Already observed climate trends:

Average annual temperatures in this area have already risen more than 2.6°F since 1900, with winter warming more than doubling warming in other seasons. Annual precipitation has increased by about one inch per decade since 1979, primarily in winter, spring, and fall. Extreme precipitation events have become more frequent.

Future climate projections:

Even under lower emissions scenarios, annual temperatures will exceed historical norms by mid-century. Extreme precipitation events will intensify, increasing runoff and flood risk, while summer droughts are expected to worsen. Growing seasons will lengthen by 18–25 days, and summer soil moisture could decline by 22–33%, stressing grasslands and water systems.

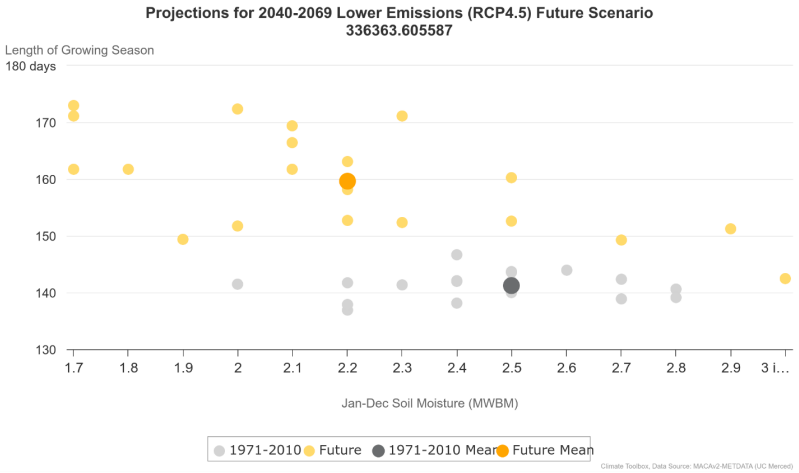

Fig. 2. Plot showing projections for 2040-2069 under a lower emissions scenario for length of growing season and annual soil moisture. Gray circles represent data modeled for 1971-2010 and yellow circles represent data modeled for 2040-2069. Lighter, smaller circles represent data from individual models and darker, larger circles represent means across models for past and future (Source: Climate Toolbox).

Climate Adaptation & Conservation Strategy

Our vision is to improve native biodiversity and ecosystem processes across grassland and freshwater habitats in the Missouri River Breaks. By 2030, we aim to protect 6,800 acres, restore 1,000 acres and promote climate-adapted management practices through partnerships and community engagement.

Key conservation and climate adaptation strategies are summarized below. For the full plan with detailed objectives and metrics, contact mahlering@tnc.org.

1 Manage ecosystems for biodiversity

Example tactics:

- Protect 6,800 acres of intact grassland.
- Restore 1,000 acres of diverse habitat for birds and other grassland wildlife.
- Use climate-adapted prescribed fire practices to promote native species and control invasives.
- Minimize impacts of energy development on ecosystems.

2 Improve freshwater system health

Example tactics:

- Promote resilient floodplain forests along the Missouri River.
- Collaborate with partners and landowners to promote good stewardship for streams, sharing techniques from the Stream Health Guide.

3 Support landowners and communities in climate-smart grassland management.

Example tactics:

- Make evidence-based climate adaptation strategies more accessible.
- Expand financial and technical assistance and connect landowners to cost share programs.
- Strengthen landowner relationships and continue role in ND Prescribed Fire Cooperative, including co-hosting workshops.

The Nature Conservancy

Find climate adaptation plans for all of our priority landscapes at **nature.org/mnclimate**.