Mesic and Wet Meadow Restoration
to Enhance Greater Sage-Grouse Habitat
Missouri-Milk River Grasslands, Montana

A collaborative initiative to improve water availability for sage-grouse and other species, and to demonstrate and evaluate "low-tech" restoration strategies in prairie systems

Project Summary: Over a three-year period, the National Wildlife Federation will work on public and private lands in north-central Montana to implement low-cost, low-tech restoration projects to improve water storage and forage quality in prairie streams.

Objectives: The site-specific objectives are to improve stream channel function and thereby maintain and improve the corresponding resource values: habitat for sage-grouse and other wildlife; terrestrial and aquatic connectivity; forage production; and water availability. In addition, this project will demonstrate the utility of these low-tech restoration practices in the ecoregion, while enhancing local capacity, practical skills, and understanding. This is important because new/cheaper restoration techniques and stronger partnerships are essential to achieving the scale of impacts that are needed to restore watershed-level processes on which the wildlife and aquatic resources in the region depend.

Project Partners: The National Wildlife Federation, Northern Rockies, Prairies & Pacific Region, is leading this project, with core financial support from the National Fish and Wildlife Foundation's Northern Great Plains Program. Our lead project partner is the U.S. Bureau of Land Management, primarily through the Glasgow, Malta and Lewistown field offices, with support of the Montana State Office. Other project partners, providing in-kind and financial support to achieve our objectives, include:

- University of Montana W.A. Franke College of Forestry and Conservation
- U.S. Fish & Wildlife Service, Charles M. Russell National Wildlife Refuge
- The Nature Conservancy of Montana
- Montana Conservation Corps
- Montana Wildlife Federation
- Artemis Sportswomen

Activities: Prairie streams will be enhanced or restored using simple, cost effective restoration techniques, including beaver dam analogues (BDAs) and post-assisted log structures (PALS)—for initiating process-based restoration in structurally starved riverscapes. Specific project locations will be identified in close coordination with project partners, implemented under the supervision of restoration professionals, and supported by a locally based habitat specialist. Volunteers, agency staff, regional partners, and work crews from the Montana Conservation Corps will collaboratively implement the projects. BDA and PAL structures will mimic natural structures similar to beaver dams to slow water, capture sediment, and increase the channel complexity on which healthy aquatic and riparian-wetland ecosystems depend. Projects may also include related techniques pioneered by Bill Zeedyk (Author of *Let the Water Do the Work: Induced Meandering, An Evolving Method for Restoring Incised Channels*, *2011*) to induce floodplain development/channel widening, mitigate channel incision, and restore mesic/wet meadows.

Our project incorporates rigorous experimental design, monitoring, and evaluation components, thanks to the participation of several University of Montana faculty members and graduate students, who will cooperate with team members to design and conduct studies at project sites to evaluate how well structures restore biophysical processes. Monitoring is necessary to track persistence of the action (BDA or Zeedyk structure) to identify any adjustments necessary, as well as determine structure effectiveness in meeting ecological and conservation goals such as providing high protein content forbs and succulent mesic vegetation that are essential for sage-grouse brood-rearing. Preliminary results will facilitate adaptive management to improve implementation practices over the three-year project period, and will allow for comparisons with application of similar techniques in other systems (e.g. SW Montana, Utah, Idaho and Colorado).

Because north-central Montana is a new ecological landscape to test these low-tech riparian restoration techniques, demonstration and learning are central to project activities throughout the three years, and will culminate in an inclusive evaluation workshop at the end of the third year. This “lessons learned” workshop will provide an opportunity for project participants, partners, and interested parties to learn about the work accomplished, identify lessons learned, and discuss best practices and priorities for mesic and wet meadow restoration work in the Northern Great Plains.

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Photos documenting before and after low-tech restoration in Perkins Gulch, by Amy Chadwick

Prior to restoration, late winter

Immediately after restoration, late spring

1.5 years after restoration; stream base flow has increased and willows regenerating