Restoring Riparian and Wet Meadow Resilience

Photo: Jeremy Roberts/Conservation Media

On the range, water is life. Riparian, wet meadow, and other mesic areas —places where land meets water—are rare but disproportionately important to wildlife and working lands. These areas are reservoirs of late–season productivity that provide reliable water and food for livestock and wildlife during the dry summer and fall.

Past degradation and dewatering have reduced the size and function of these mesic areas. Protecting and restoring these sites is essential to improving overall rangeland resilience to drought, fire, watershed scale, and flooding. From a wildlife standpoint, targeting conservation actions close to sage grouse breeding and nesting habitats helps ensure a reliable source of insects and forbs to feed growing chicks as uplands dry out in the summer sun.

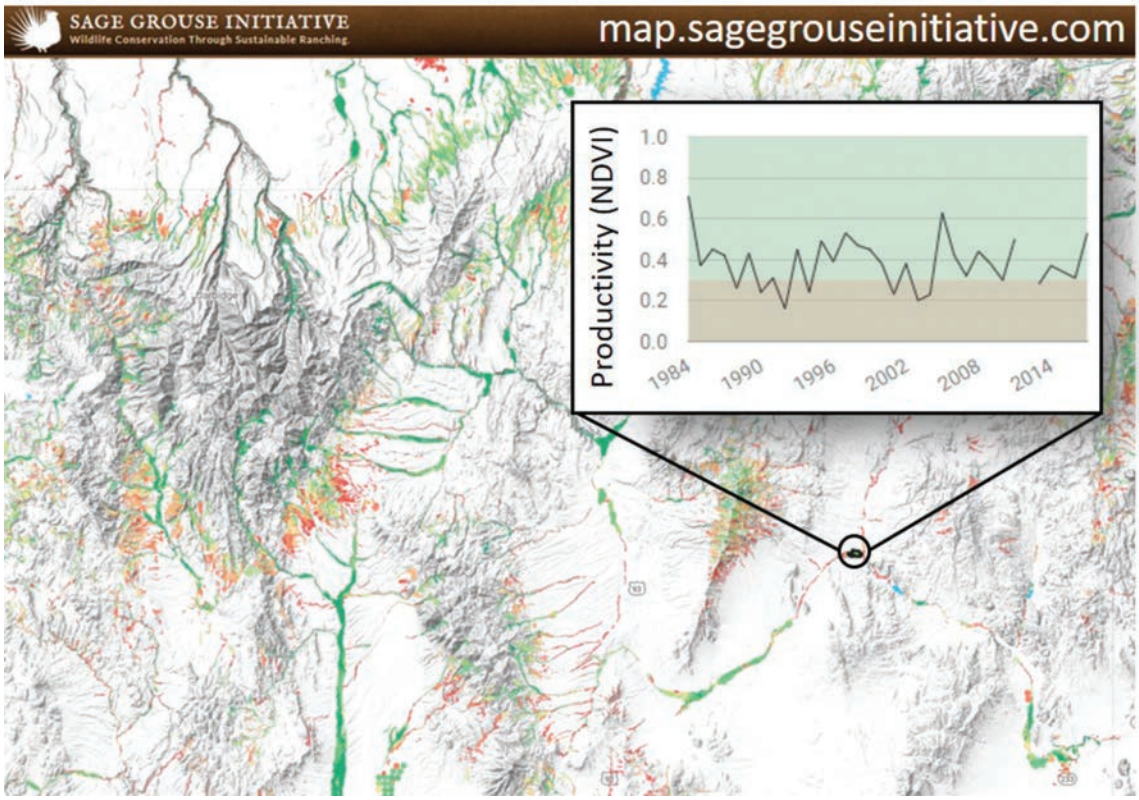
Anchored in Working Lands for Wildlife (WLFW) science, the USDA's Natural Resources Conservation Service (NRCS) has created a cooperative venue for ranchers to restore and

In Brief: Restoration of riparian areas and wet meadows realize quantifiable gains in productivity and drought resiliency.

enhance water resources. Working lands science shows private grazing lands are central to water conservation in the sagebrush biome. Although wet summer habitats cover less than 2 percent of the landscape, 50–90 percent are located on privately managed ranchlands.[1,2] Availability of nesting habitat was previously thought to be the primary determinant of grouse distributions. WLFW science shows that sage grouse also place their breeding grounds near water where hens go to raise their chicks—with 85 percent of leks within six miles of these wet habitats.[1] Drought sensitivity also structured grouse populations wherein landscapes with the greatest uncertainty in mesic abundance and distribution supported the fewest grouse.[2]

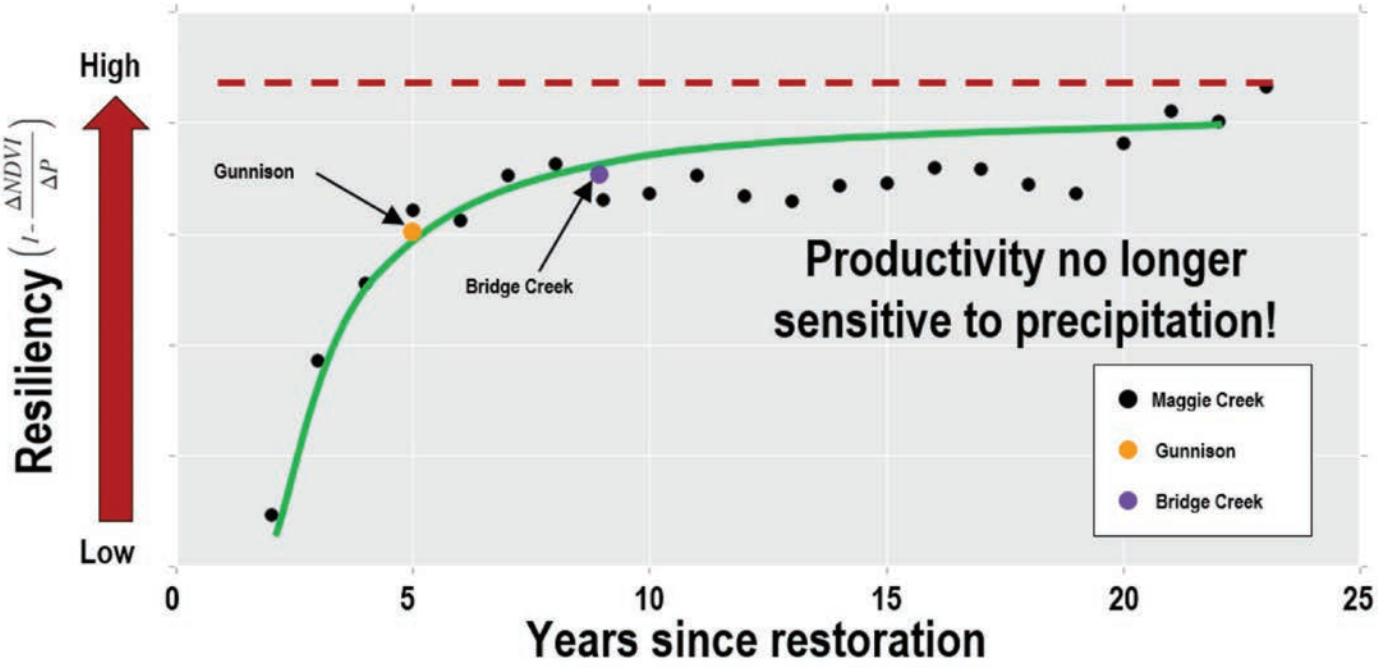
To better target management opportunities, WLFW scientists mapped these wet resources over time across the West and provided these data through a free and publicly available web application (https://map.sagegrouseinitiative.com/). Follow–up science extends the importance of privately stewarded wet meadows to other species, including continental waterbird migrations.[3,4]

In addition to these insights, WLFW science documented the efficacy of various mesic restoration techniques. In a retrospective study of three watershed–scale restoration projects across the West, scientists found that Zeedyk structures, beaver dam analogues, and grazing management increased riparian and wet meadow vegetation productivity by 25 percent and kept plants greener longer throughout the growing season.[5] Restoration efforts also exhibited reduced sensitivity to precipitation over time, resulting in greater resiliency against the stresses of drought and climate variability. Findings exemplify the dual benefits of restoration to ranching and wildlife.



Mesic productivity maps enable managers to visualize the changing productivity of wet their resources during drought and deluge.

Riparian and Wet Meadow Degradation

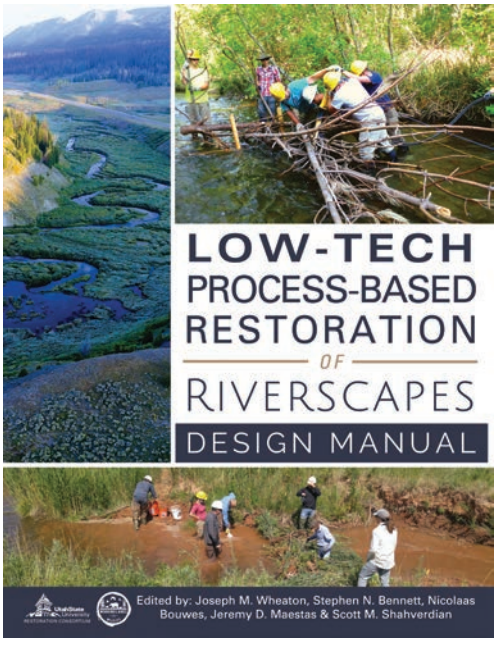


Gunnison, CO
Zeedyk Structures (short-term: 2-5 years)

Bridge Creek, OR
Beaver Dam Analogues (medium-term: 9 years)

Maggie Creek, NV
Grazing Management (long-term: 20+ years)

WLFW is putting this science into practice through technology transfer and training led by the NRCS' West National Technology Support Center in partnership with Utah State University's Restoration Consortium, private consultants, and other agencies. Together, these groups have hosted dozens of field and virtual workshops (http://lowtechpbr.restoration.usu.edu/) and webinars reaching nearly 2,000 practitioners. WLFW also sponsored the publication of technical restoration design manuals and pocket guides detailing how to implement this low–tech restoration work. These efforts have enabled more landowners and partners to participate in scaling up mesic restoration to improve the resiliency of water resources in the region for the benefit of people, wildlife, and livestock.



WLFW–SUPPORTED SCIENCE PUBLICATIONS:

1. Donnelly J.P., D.E. Naugle, C.A. Hagen, and J.D. Maestas. 2016. Public lands and private waters: Scarce mesic resources structure land tenure and sage–grouse distributions. Ecosphere 7:e01208.

2. Donnelly, J.P., B.W. Allred, D. Perret, N.L. Silverman, J.D. Tack, V.J. Dreitz, J.D. Maestas, and D.E. Naugle. 2018. Seasonal drought in North America's sagebrush biome structures dynamic mesic resources for sage–grouse. Ecology and Evolution 8:12492–12505.

3. Donnelly, J.P., S.L. King, N.L. Silverman, D.P. Collins, E.M. Carrera–Gonzalez, A. Lafón–Terrazas, and J. N. Moore. 2020. Climate and human water use diminish wetland networks supporting continental waterbird migration. Global Change Biology 26:2042–2059.

4. Donnelly, J.P., D.E. Naugle, D.P. Collins, B.D. Dugger, B.W. Allred, J.D. Tack, and V.J. Dreitz. 2019. Synchronizing conservation to seasonal wetland hydrology and waterbird migration in semi–arid landscapes. Ecosphere 10:e02758.

5. Silverman, N.L., B.W. Allred, J.P. Donnelly, T.B. Chapman, J.D. Maestas, J.M. Wheaton, J. White, and D.E. Naugle. 2019. Low–tech riparian and wet meadow restoration increases vegetation productivity and resilience across semiarid rangelands. Restoration Ecology 27:269–278.

RELATED READINGS:

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Fesenmyer, K.A., D.C. Dauwalter, C. Evans, and T. Allai. 2018. Livestock management, beaver, and climate influences on riparian vegetation in a semi–arid landscape. PLoS ONE 13:e0208928.

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Swanson S., S. Wyman, and C. Evans. 2015. Practical grazing management to maintain or restore riparian functions and values. Journal of Range Applications 2:1–28.

Wheaton, J.M., S.N. Bennett, N. Bouwes, (editors). 2019. Low–tech process–based restoration of riverscapes: design manual Version 1.0. Utah State University Restoration Consortium. Logan, Utah.

Wheaton, J.M., A. Wheaton, J. Maestas, S. Bennett, N. Bouwes, S. Shahveridan, R. Camp, C. Jordan, W. Macfarlane, E. Portugal, and N. Weber. 2019. Low–tech process–based restoration of riverscapes: Pocket field guide. Utah State University Restoration Consortium. Logan, Utah.