

A Synthesis of Livestock Grazing Effects in Sierra Meadows

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Sierra Nevada wet meadows are ecological services workhorses: they are hotspots of biodiversity, provide important water storage and water quality improvements, and sequester lots of carbon. Unfortunately the majority of Sierra meadows are degraded from more than a century of abuse, including water diversions, poorly placed transportation infrastructure, and overgrazing, rendering them less effective at providing these important services. Major efforts are underway to restore meadows across the Sierra.

Grazing continues today in many Sierra meadows on public and private land. To help inform meadow restoration and management we conducted an extensive literature review to synthesize the effects of grazing on Sierra meadows. We evaluated the scientific literature pertaining to seven resource areas of wet meadow ecology: hydrologic function, water quality, plants, soil, fens, fish, and wildlife. We identified 47 peer-reviewed published

studies that met our systematic literature review criteria.

The studies we evaluated reported 42 negative impacts on resource areas of interest, 7 neutral, and 4 positive. These results suggest restoration goals may be challenging to achieve under the conditions and grazing practices evaluated in these studies, which are common throughout Sierra meadows. The dearth of positive effects of grazing in Sierra meadows suggests these ecosystems do not benefit from livestock grazing to the extent that has been reported for some California ecosystems.

There was some evidence that reduced grazing pressure, such as what is recommended in the riparian standards adopted by the Forest Service, may reduce negative impacts. Further study is warranted to evaluate reduced grazing pressure on wet meadow ecology.

Practitioners should consider prioritizing meadow restoration where livestock grazing has been or will be removed

temporarily or permanently. When restoring a meadow that will be grazed after restoration, practitioners should explicitly address grazing management in the design process to ensure plans are robust to grazing pressure and monitor impacts to advance our understanding of grazing in Sierra Meadows.

Main Points

Livestock grazing had predominantly negative impacts to wet meadow ecology in our literature review

Restoration teams should find ways to mitigate livestock grazing impacts in restoration planning

More research is needed to evaluate reduced grazing pressure on wet meadow ecology

Vernon, M.E., B.R. Campos & R.D. Burnett. 2022. Effects of livestock grazing on the ecology of Sierra meadows: A review of the current state of scientific knowledge to inform meadow restoration and management. Env. Mgmt. [Hyperlink](#)