

*Bringing Back The Water*  
*Case Study Series*



# WATER AND SOIL SOLUTIONS USING SHEEP'S WOOL



**LOR**  
FOUNDATION



FIELD WORK

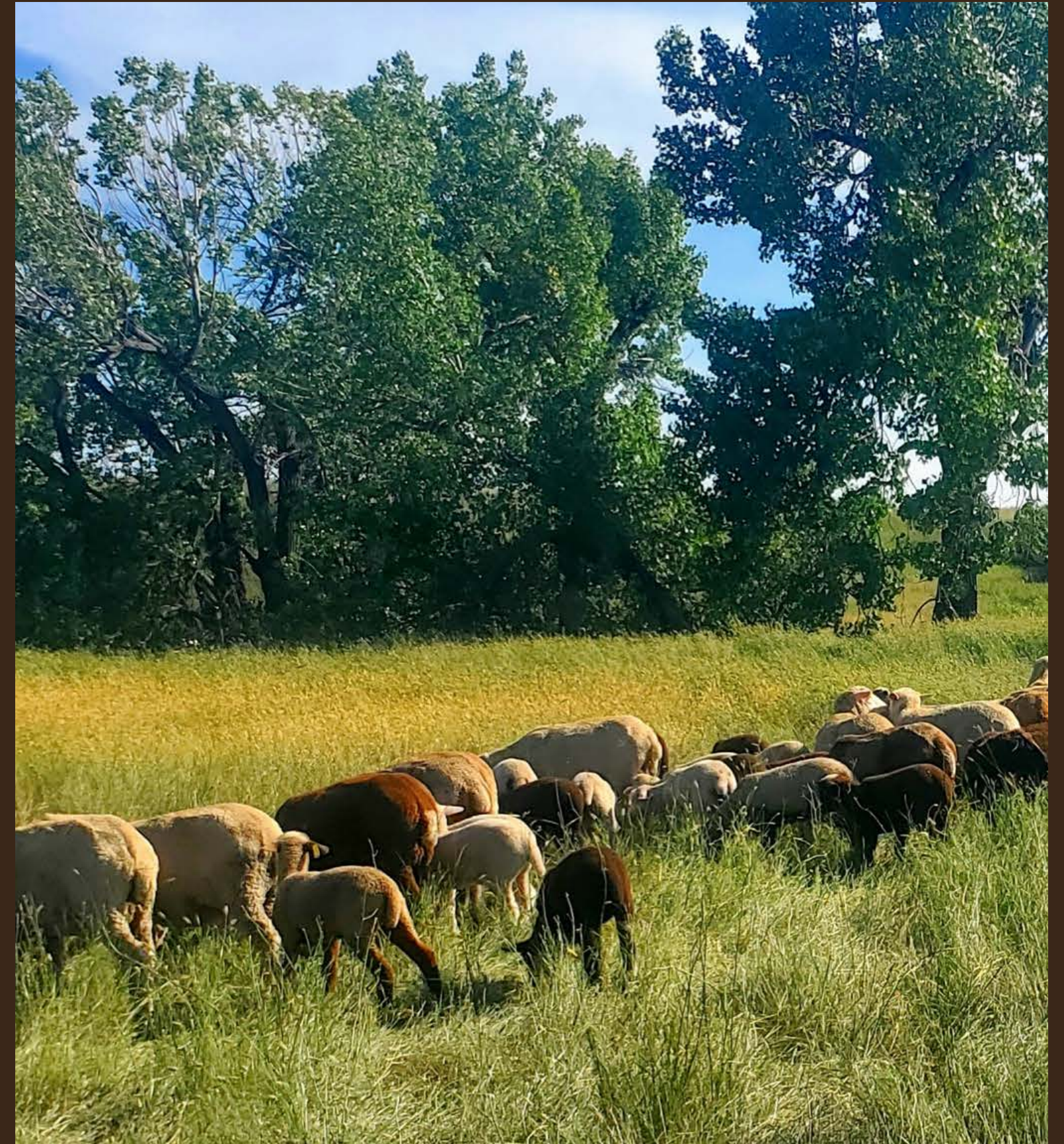




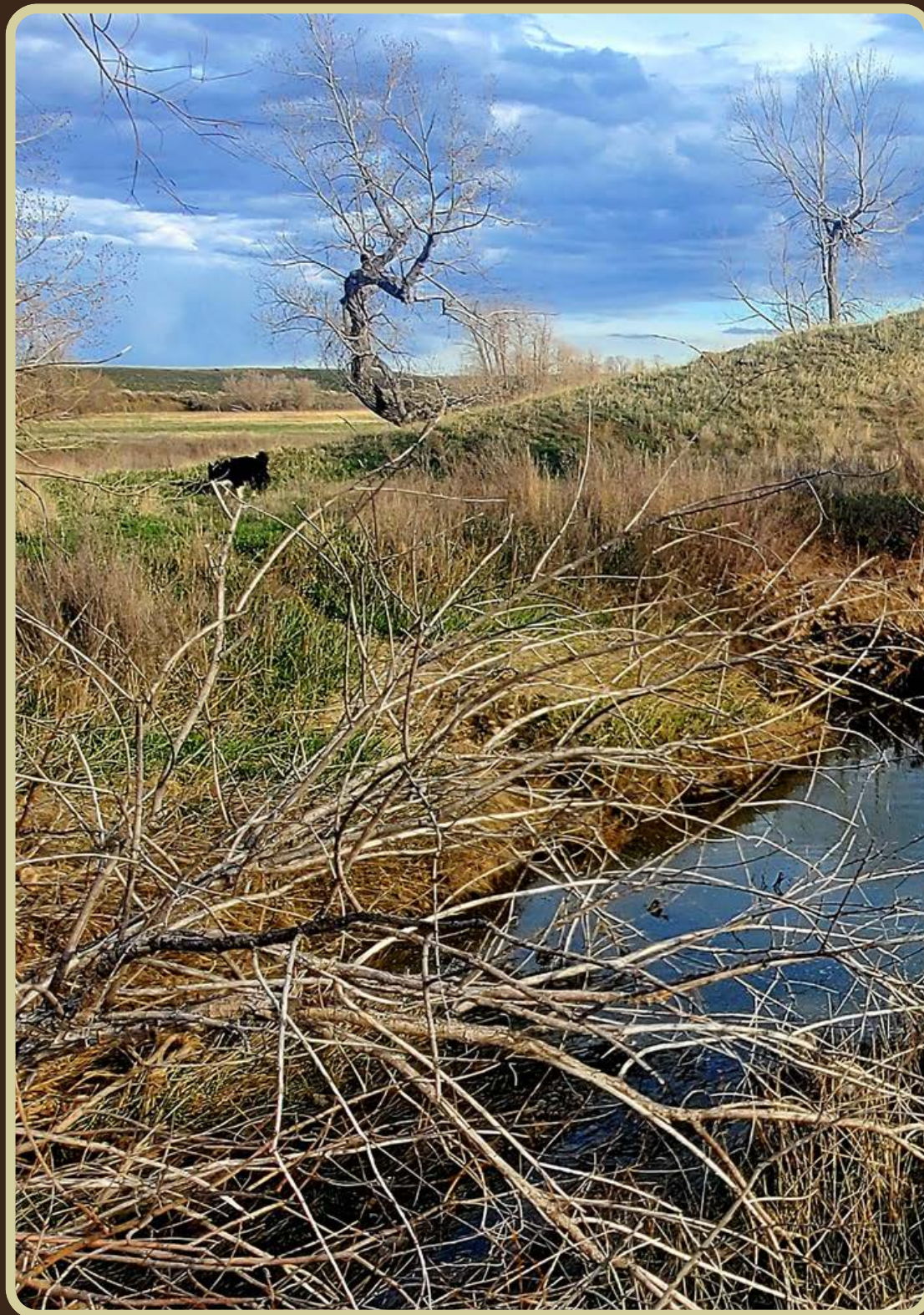
# SNAPSHOT

Linda Poole manages a 320-acre property in South Phillips County, Montana, where she raises fine wool sheep. Linda's property includes a half-mile section of stream, which provides flood irrigation on her land.

In 2023 Linda received funding through the LOR Foundation's Field Work Initiative to support the installation of beaver dam analogs on her property and construction of composting bioreactors using existing materials.







# INSPIRATION

Linda was inspired to create beaver dam analogs by naturally occurring dams existing on her property.

Beaver dam analogs are man-made structures that mimic natural beaver dams. Dams help direct and slow the flow of water through the streambed which has numerous benefits to the riparian ecosystem.

.Linda drew from the work of Bill Zeedyk, the author of "An Introduction to Induced Meandering" which is a technical guide to sustainable riparian restoration.

The composting system Linda created was inspired by the Johnson-Su bioreactor method which creates microorganism dense compost intended to improve carbon sequestration and improve the soil's ability to absorb water.



## COMPOST

Materials available on the property were utilized to create the compost bioreactor creating the base out of sticks rather than a pallet and using wool in place of landscaping fabric to wrap the bioreactor.

To create the composting bioreactors a base of sticks was created for aeration underneath a hog wire cage containing layers of wet barley straw, sheep corral cleanings, waste wool, chicken litter, and pine flakes in 6-8 inch layers. The cage was then wrapped in a layer of wool.





# BEAVER DAM ANALOGS

This project utilized resources available on the landscape; fallen cottonwood trees and sheep's wool

Locations were selected based on several key factors:

- where dams would occur naturally
- where they would have the biggest benefit
- where materials were accessible
- where they were likely to stay in place based on stream morphology.

Project sites included

- 20 man-made beaver dam analogs
- 10 naturally occurring dams to enhance with additional materials
- 10 naturally occurring dams as a control group.





# INSTALLATION



Crew spent 5 days moving fallen trees into place in the selected locations. Material was then added to fill in the gaps between the branches.

- 3 sites used loose wool
- 6 sites used wool caged in chicken wire to control pests
- 5 sites used felted wool
- 6 sites were left without any wool

Wool was also added to five of the ten naturally occurring dams selected to enhance with additional materials.





# EVALUATIONS

It will take years for the full impact of this project to be known. Since execution was completed there has been little water in the stream to determine the effectiveness of the beaver dam analog structures.

A precipitation event in February 2024 did yield some water flow, and observations during that time showed promising signs for the success of this project.

Wool has proved efficient at holding moisture and regulating temperatures in the composting bioreactors, however the use of the bioreactors did not yield improved bacterial to fungal ratios when compared to heaps of corral waste.





# REFLECTIONS

- Loose wool might be a favorable material to felt because it more closely mimics the debris that built up in the naturally occurring dams.
- Felt and wool attracted pests such as mice which in turn attracted foxes that would tear out the material in an attempt to reach the mice. This challenge inspired the use of chicken wire to hold material in place in some structures.
- Future expansion of this project would ideally use a natural material rather than chicken wire





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About the LOR Foundation: LOR works with rural communities in the Mountain West to enhance livability and prosperity while preserving the character that makes each community unique.