

House Committee on Agriculture, Land Use, Natural Resources, and Water  
Oregon Capitol  
900 Court St NE  
Salem, OR 97301

February 16, 2023

Chair Helm, Vice-Chairs Hartman and Owens and members of the Committee on Agriculture, Land Use, Natural Resources, and Water:

My name is Tony Malmberg with Bunchgrass Land and Livestock in Union. I am testifying in strong support of HB 2998, the Healthy Soils Bill.

I am a third-generation on the ground owner and operator rancher who has run cattle in Nebraska, Wyoming, and now Union County, Oregon. I have been a decision maker in the management of ranches in eastern Montana and the Great Plains of South Dakota. I have been practicing Holistic Management for 36 years and am a Master Field Professional, with the [Savory Institute](#) and an employee of the [SI Hub, UVE](#).

In understanding how nature works, managers can influence those processes and double their animal carrying capacity. The foundation of the improved economic return, social well-being, and ecological function, grounds in soil health.

It's possible to eliminate the costly impacts of flood and drought. When a rain drop hits the earth, it can run to the river and flood, it can evaporate, or it can soak into the soil. If we choose for it to soak the soil, it will grow forage, recharge springs, recharge aquifers, and sustain the hot-season flow of rivers. Flood and drought resistance depends on soil health. One percent soil organic matter holds from 16,000-28,000 gallons of water per acre. It comes down to soil health.

It's possible for a rancher to double the number of cattle they're grazing per acre, while cutting expenses. If we manage our grasslands in the way they evolved (with high disturbance events followed by long recovery periods), we can achieve their full potential production. It comes down to soil health.

It's possible for ranchers to eliminate expenses, such as synthetic fertilizer, herbicide use and irrigation costs, as they increase production. For example, monitoring available water content reduces compaction and can increase income by leasing water for instream flow. It comes down to soil health.

In summation, the ecological health, production, and profitability of ranching and livestock grazing improves as soil health improves.

The Soil Health Initiative would help support farmers and ranchers with implementation support as well as monitoring outcomes that work for them and their land. Trusted farm service providers such as OSU extension and Soil and Water Conservation Districts are well positioned to develop the knowledge and skills of land managers to increase production, profitability, and improve soil

health. These skills can assist the land manager in making real time decisions at the soil surface, such as how to:

- ✓ **Improve plant vigor**-by monitoring plant growth rates to minimize overgrazing.
- ✓ **Increase plant density**- using animal impact and timing to create germination sites.
- ✓ **Improving the water cycle**- covering the soil and recharge aquifers, springs, and rivers.
- ✓ **Increase plant diversity**- capturing more sunlight through timing of grazing.
- ✓ **Improve drought resilience**- building soil and soil organic matter.
- ✓ **Improve animal performance**- Increase brix (sugar content) of fodder.

Here are some of the outcome verification options to verify soil health:

**Evapotranspiration**- This can verify effective use of our precipitation.

**Soil Organic Matter**- This metric is more reliable than carbon sequestration.

**Hydrologic function**- This can document river function and connecting rivers to floodplains.

The Healthy Soils Bill HB2998 can support the greatest leverage point of improving soil health—by empowering the decision maker closest to the soil surface—the farmer or rancher.

More on the benefits we've seen on our land:

The 2021 Drought cut our county's production in half.

- On property we had managed for 3 years we produced 66% of the average.
- On property we had managed for 12 years, we produced 103% of average.
- And rivers connected to flood plains sustained production in drought.

With healthy soil and rivers connected to flood plains, there is no drought.

Please support, and do all you can to advance, HB 2998.

Thank you for your consideration and your service.

Tony Malmberg  
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<https://www.holisticmanagement.guide/>

See attached Ecological Outcome Verification monitoring data on our place and soil temperature data.

JUNE 29, 2021

UNION, OREGON USA

BRITTLE TENDING



116 °F (47°C) Ambient  
"Heat Dome"

145 °F (63 °C)  
Extensively Irrigated  
Compacted Soils

89 °F (32 °C)  
11 years Holistic Management  
Discontinued Irrigation

**Context:**

Prior to 2010, the Dairy Pen pasture at Union Meadows in Northeast Oregon had been primarily an irrigated, cropped, and hayed pasture with 1874 priority water rights. In 2010, we entered into a 3-year Full Season Lease with The Freshwater Trust that kept our water instream resulting in payment for the ecosystem service we provided. Our experiment was to see if discontinuing irrigation and improving the water cycle through grazing and animal impact would affect production. We hypothesized that less water would improve our production due to the prevalence of hydrophytic plants, like Baltic Rush.



After three years, we reread the transect, which concluded the production went from 4470#/acre to 6864#/acre - a 54% increase from baseline and species diversity improved.

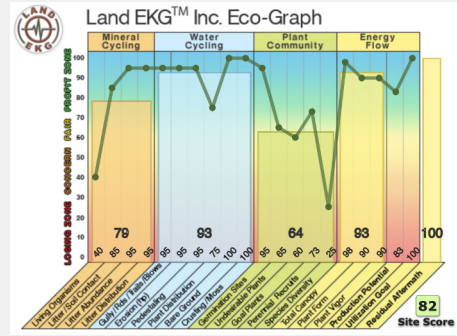
**The Incentive and the Management:**

As a result of our 2013 data, we entered into a 20-year Time Limited Transfer with The Freshwater Trust. As we executed our holistic grazing plan, our stock density ranged from 47-76 stock units per acre, with an average of 50 (the equivalent of 50 1000-pound animals). We also managed for "time," or how long plants were exposed to being grazed during the growing season allowing for adequate recovery, which was 1-4 days.

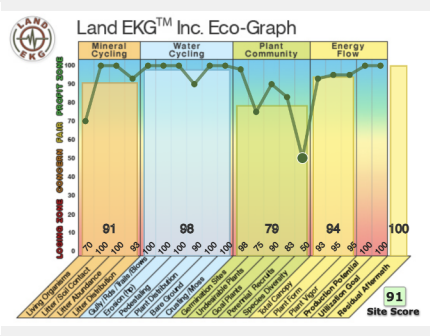
**The Dairy Pen Pasture at Union Meadows**

**Monitoring Protocols:**

Since the late 90's, while ranching in Wyoming and from 2010 - 2019 in Oregon, we utilized Land EKG as our monitoring protocol. We appreciated how it transformed simple field data into a visual eco-graph that depicts the function and productivity of the ecosystem processes.



August 16, 2010



August 17, 2019



August 16, 2010 - East



August 16, 2010 - West



August 16, 2010 - South



August 17, 2019 - East



August 17, 2019 - West



August 17, 2019 - South

When the Savory Institute developed Ecological Outcome Verification, we switched because of its scientific robustness, joining pastoralists worldwide to monitor within our contexts. As ranchers, we depend upon relevant information that is simple to gather, shows trends, provides early warning indicators if things are not going as planned, and facilitates improved decision-making for better management. In 2023, we will convert from Land EKG to EOv because of the scientific rigor, verification, and global implications for policy change.

**Observations:**

After ceasing irrigation, the water-addicted pasture initially became water-phobic, creating the conditions for an influx of contextually undesirable plants like Canada Thistle and White Top. Using the tools of multi-species grazing and animal impact, we have improved the water cycle and are moving towards a more desired plant community. When observing a shovel of soil at a ranch purchased in 2018, agroecologist Nicole Masters made us aware of a notable thatch cover. She suggested that microbial activity would take five years of intensive grazing to decompose the thatch and allow roots to go below the 3-inch thatch. While we don't have a soil profile sample to prove this, the observation suggests this may have been the case in the Dairy Pen, where plant density and vigor improved tremendously from years 4 to 9 with planned grazing.

**Results:**

After 9 years of not irrigating, we have seen further improvement in ecological function and increased production. The most significant changes from 2010 to 2019:

- Plant basal cover increased from 25% to 55%.
- Plant vigor has improved, with average leaf height increasing from 15 to 28 inches and maximum leaf height from 23 to 53 inches.
- Production has increased from 4470 to 7812 pounds per acre - a 75% increase from baseline.
- Species diversity improved by +180%.
- Contextually desired plants are up by +138%.
- Undesirable plants are down by -115%.
- Plant distribution improved by 120%.
- Living Organisms improved by 175%

While we still have much work to do, regeneration in such a short amount of time with a decrease inputs is encouraging.



Leasing water for instream use has provided an additional income stream, increased production, decreased labor costs, and added .33 cfs to the imperiled Catherine Creek fishery. Our experience shows that water leasing does not have to be a zero-sum game in the Grande Ronde Watershed. Farmers and ranchers can provide necessary ecosystem services while increasing production.