grassLAND 2.0

Case Study:

Building Collaboration towards Agroecological Transformation:

Scoping a Northeast Wisconsin Learning Hub and Opportunities for Dairy Heifer Grazing

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Figure 1. Location of *Grassland 2.0* Learning Hubs in Wisconsin and Minnesota. Dark polygons indicate more mature Learning Hubs, while grey polygons indicate emerging Learning Hubs where local communities are organizing to begin Collaborative Landscape Design process. For this project, we focused in NE Wisconsin, particularly the region west/northwest of Lake Winnebago.

Through the **Collaborative Landscape Design** (CLD) Learning Hub work, *Grassland 2.0* has identified a set of key activities that are necessary for place-based, transformational change:

1) Connecting people,

2) Envisioning novel landscapes,

3) Designing supply chains,

4) Planning enterprises, and

5) Institutionalizing change.

These CLD activities are not entirely sequential, but they do in many ways build off of and are iterative of/with each other. Certainly, the first stage of the formation of a Learning Hub is to begin to build conversations and relationships with key thought and action leaders in the region to understand the interests and issues facing the communities.

Figure 2. Depiction of Collaborative Landscape Design process situated within Learning Hubs.

Grassland 2.0

Grassland 2.0 is a collaborative project led by UW-Madison and involving farmers, researchers, and public and private sector leaders working to develop pathways for increased farmer profitability, production systems that gain nutrient efficiency while improving water quality, soil health, biodiversity and climate resilience through grassland-based agriculture. *Grassland 2.0* seeks to co-create a vision and action plan to reshape Midwestern agriculture as a perennial, livestock-integrated, grazing-based system in the image of the original native prairies (*Grassland 1.0*).

Grassland 2.0 engages with rural communities interested in managed grazing through regional learning-and-action networks called **Learning Hubs**. To date, there have been three active Learning Hubs and five emerging Hubs in Wisconsin (Figure 1). The *Grassland 2.0* Learning Hub model is a facilitated *Collaborative Landscape Design* (CLD) process bringing together farmers, landowners, community leaders, agency, non-profit, and university partners in a particular place. to build knowledge and action around opportunities and challenges of transforming agricultural systems from current systems that deplete people and the land to those that enrich—economically, ecologically and socially (Figure 2). Participants in these hubs engage in CLD to develop scenarios for change and adaptive planning, and to share technical knowledge to overcome identified barriers to adoption of managed grazing. These efforts are assisted by decision-support tools such as the Heifer Compass, Smartscape™ and Grazescape™ to better understand the ecological and economic outcomes of their decisions, identify supply chain needs to build markets for grassfed products, and co-develop strategies that support both farm profitability and ecological health within their priority watersheds.

Scoping a Northeast Wisconsin Learning Hub

In June 2024, *Grassland 2.0* began efforts in northeastern Wisconsin to assess interest in the formation of a new Learning Hub by engaging with farmers, agency staff, NGOs, and other community partners in the northern Lake Michigan Basin. This region (focused on Oconto, Shawano, Outagamie and Winnebago Counties in the Fox-Wolf Watershed Basin) has significantly degraded water quality due to both urban industry and high concentrations of confined livestock operations in the rural areas. Over the past year, *Grassland 2.0* has engaged with over 60 stakeholders to build relationships and facilitate network building and collaboration. This engagement

has included area farmers, county and regional Land and Water Conservation Districts, board members and staff; state-based federal agency representatives (e.g. USDA-NRCS) through interviews, community meetings, farmer roundtable discussions, regional events and field days. The following activities were undertaken to "connect people" and assess the appetite for engaging in other dimensions of CLD:

Key Pilot Project Highlights:

2024

- Collaboration with UW-Oshkosh *Sustainability Institute for Regional Transformations* (SIRT), including work together with WiSyS on a NSF grant proposal, and exploring connections with SIRT's ongoing Harmful Algal Bloom project;
- Interviews with over 40 farmers, county Land and Water Conservation District and NGO staff active in the region;
- Participation in regional Land and Water Conservation District (LWCD) meetings that included staff and county board members, farmer roundtable meetings and regional field days;
- Facilitation of farm-level economic analyses of dairy heifer grazing using the Heifer Compass, with 20 Natural Resources Conservation Service (NRCS) and county conservation staff;
- Coordination with UW Extension Dairy Educator in the region regarding opportunities for virtual fencing technologies as a support for transition to grazing systems.
- Conversations with tribal nations in the northeast. Working with the Wisconsin Tribal Conservation Advisory Council (WTCAC)[1] and Great Lakes Intertribal Food Coalition (GLIFC)[2] around some initial scenario development on grass-based beef that is going in the Tribal Elder Food Box Program distributions, which includes distribution of grass-based proteins (beef, chicken, and bison) from both tribal and non-tribal producers;

2025

- Co-hosted a July pasture walk featuring custom heifer grazing and the relationship between the "sending" CAFO and the custom grazier, with county LWCD staff, UW-Extension, USDA-NRCS, Golden Sands RC&D and other NGOs in the region;
- Facilitation, co-planning and September event support for "GrassStock!", an inaugural celebration of grassland-based systems held in the Basin (Figure 3), where over 20 federal, county and non-profit organizations came together to share information with the public and to celebrate support for grassland-based systems.

Figure 3. GrassStock! event banner. *From* GrassStock!, 2025

[1] WTCAC, a key participant in the Coalition, is a lead in the group on supporting and facilitating producer training and organization to build tribal producer skills and infrastructure to support conservation practices in the tribal food system development.

[2] GLIFC collaborates with UW-Madison on a multi-year USDA grant focused on tribal food sovereignty. Future work in the region should engage with GLIFC and WTCAC as a starting point, to support the work of these organizations.

What have we learned?

Northeastern Wisconsin has a rich mix of people, organizations and initiatives, agencies, and communities active in agriculture and conservation. *Grassland 2.0* brings to the table the ecological, economic, and social opportunities and imperatives around well-managed grazing. The demand and appetite for *Grassland 2.0*'s work with facilitated network building to support relationships between farmers, technical service providers, agency staff, and non-profit organizations is very clear in the four northeastern counties:

> "We need these opportunities to gather, to explore options, and to share our stories of what we see on our farms and what we need to be successful."
>
> —Farmer/Community leader in Fox-Wolf Watershed Basin

Opportunities for Dairy Heifer Grazing in NE Wisconsin

Building off of Learning Hub development in other parts of the state and Minnesota over the last five years, and insights gained through the place-based work in the Cloverbelt Learning Hub in north-central Wisconsin, *Grassland 2.0* has identified scaling dairy heifer grazing in the region as a win-win-win solution. Heifers represent 24 months of a cow's life and perform well in managed grazing systems. Raising grassfed dairy heifers can[1]:

(i) improve soil health, water quality, and biodiversity,

(ii) provide high value and low-cost forage for ruminants,

(iii) reduce the climate impact and animal stress of shipping heifers long distances.

Animal health and performance is on par if not improved for heifers raised in managed livestock grazing systems, supplying dairy farmers with successful replacements for their milking herd (Kalscheur et al. 2024, Rudstrom et al. 2005[2]). Along with ecological benefits, the reduced input costs of heifer grazing compared to confinement systems can increase dairy farm profit margins.

As part of this pilot work in the northeast, *Grassland 2.0* introduced scaling dairy heifer grazing as a pathway to be explored (Table 1). In this target region, based on USDA figures, there are approximately 23,310 heifers needed each year by the larger dairy herds (500 cows or more). Assuming two acres of well-managed pasture is needed to graze one heifer per year (one acre rotationally grazed during the Wisconsin grazing season and one acre of grass harvested during the growing season and stored for feeding in the winter), transition to putting heifers on grass would impact 46,620 acres. Assuming a 30% "adoption" of heifer grazing by the larger herds in the 4-county area, the impact would reach 13,986 acres.

Table 1. Number of cows and heifers in the target region

	Oconto	Shawano	Winnebago	Outagamie	4-County Area	Heifer demand at 38% replacement rate
1–19 cows	11	58	10	58	137	52
20–49 cows	212	322	135	591	1260	479
50–99 cows	1,447	2,334	615	2,400	6,796	2,582
100–199 cows	2,674	2,269	1,200	2,609	8,752	3,326
200–499 cows	8,147	6,848	3,410	7,818	26,253	9,976
500 or more	10,590	17,313	11,494	21,946	61,343	23,310
Total	23,081	29,174	16,864	35,422	104,541	39,426

NOTE: Estimate on # of cows on 1–19 Shawano and Outagamie because date suppressed by USDA
SOURCE: Wisconsin Table 11, 2022 US Census of Agriculture

[1] Lloyd 2025, Dietz et al. 2024, Jackson 2024, Rojas-Downing et al. 2017

[2] Ongoing research at the University of Wisconsin-Madison's Marshfield Agricultural Research Station with the USDA Dairy Forage Research Center is assessing the performance of grazed heifers compared to those reared in confinement fed with Total Mixed Ration (TMR) systems, replicating a smaller study showing that when entering a confinement milking herd, heifers raised using rotationally managed grazing methods had higher dry matter intake and milk production in the first lactation.

Where to go from here?

A next step for the northeast would be to lean in on economic and ecological outputs of transition to dairy heifer grazing. The *Grassland 2.0* Smartscape™ and Grazescape™ decision support tools can be deployed by the Learning Hub group to model cropping and production system changes, from for example corn and soy, or corn, soy and alfalfa production in the dairy rotation transitioned to well-managed grazing by the watershed and farm respectively. In other watersheds we have worked in, the models show significant water quality improvements (i.e. reduced N and P runoff, reduced erosion, increased biodiversity supports).

On the economic side, the Learning Hub group can work to imagine how many heifer grazing enterprises and of what size would need to be activated, as well as the types and guidelines for relationships that are necessary between the "sending" farmers and the custom operators to use the grazed and harvested pasture forages from the 13,986 transformed acres. In this same vein, when examining the supply chain dynamics in the region, we can extrapolate how many pounds of milk would be produced when these grazed heifers enter the lactating herds and begin to line up supply to a plant or a product that could pull through ecological data/ecosystem services claims on that milk based on the land use, crop and pasture systems.

In addition to the specific work around dairy heifer grazing, the discussions with the tribes in the region would look at the ecological and economic opportunities and scale and scope around grass-fed meat production (primarily beef) that is part of the current efforts of the Great Lakes Intertribal Food Coalition, distributing indigenous grown, culturally-relevant foods to tribal elders and other community members (i.e. kids, moms).

The challenge more generally in the region is to keep resources coming together, in the light of federal funding cuts and reorganizations, to keep the facilitated network building and collaboration happening and diverse organizations and farmers able to have clear goals that they can come together around and work towards in actions that are relevant for the place.

It is with the development of shared visions for the future ecological and economic contours of the place that actions can be taken, together, to reach those goals.

A closer look at dairy heifer grazing in Wisconsin

Based on *Grassland 2.0* analysis of the University of Minnesota FINBIN farm enterprise numbers (https://finbin.umn.edu/), raising a heifer seasonally (~180 grazing days) in a managed grazing system costs approximately $0.99/head/day, compared to $2.50/head/day in a confinement system—a savings of $1.51/head/day (Rudstrom et al. 2005). An operation with 100 heifers over a 180-day grazing season could save $27,180 (Table 2).

Table 2. Value proposition for dairy heifer grazing. *Adapted from*: Lloyd 2025.

Farm transition scenario	Acres and # of heifers in operation* *1 acre/heifer	Profit/Savings from 180-day dairy heifer rearing operation* *1 dairy heifer grazing season, $2.50 head/day	Profit/Savings from 24-month dairy heifer rearing operation* *2 dairy heifer grazing seasons, $2.50 head/day
Dairy farm going out of milking → transition to custom dairy heifer grazing	50	$16,308	$32,616
	100	$27,180	$54,360
	200	$54,360	$108,720
	500	$142,200	$284,400
	1000	$284,400	$568,800
Current cash-grain operator → transition to custom dairy heifer grazing	300	$81,540	$163,080
Current dairy farm → transition from confinement to grazing their own replacement dairy heifers	190	$51,642	$103,284

Connecting dairy farmers with custom heifer graziers opens the possibility for new, rural enterprises.

A custom heifer grazier ("custom operator"), raising 50 heifers for another farm (cost of $0.99/head/day), charging the going rate (e.g. $2.50 head/day) could cover costs and net $16,308 over the grazing season; at $3.00/head/day, the net return to the custom operator would be $21,708 (Lloyd 2025). Over the 24-month life stage of dairy heifers, the net return to the custom operators (at $2.50 head/day) would be $32,616. Charging a slight up-charge for custom heifer grazing (at $3.00 head/day) would be $43,416. Rearing replacement dairy heifers on pastures in Wisconsin provides an opportunity not only to reduce GHG emissions from the dairy system, but also to support small- to mid-sized dairy farms that otherwise might be exiting the farm sector because of consolidation pressures.

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