On a Cold, Clear Day, You Can See the Future of Land Management: Returning Grazers ... and Browsers to the Land!

On February 27, 2019, an enthusiastic group of land managers toured the wood lots of Goat Dispatch owner Jake Langeslag along with Hiawatha Valley RC&D director John Beckwith and Landscape Restoration’s Cheryl Culbreth, waded through the deep snow on a very bright, cold day. Our objective was to see the results of a study assessing goat’s ability to thrive and continue to browse undesirable and invasive woody plants, during the winter.

Study Title: Goat Grazing During Winter in Minnesota: Ways to Control Vegetation on a Larger Scale While Saving on Supplemental Feed Costs.

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www.mda.state.mn.us/greenbook

This project evaluated winter grazing systems to maintain a healthy goat herd and provide control of invasive and undesirable plants during Minnesota winters. The overall goal was to determine if this is profitable strategy for service and meat goat enterprises. The project assessed winter husbandry challenges, including: effective electric mesh fencing, sheltering, watering, and meeting nutritional requirements. The project also assessed if the season’s limited browse and forage plants will encourage girdling, so the goats graze a larger area of invasive and undesirable woody vegetation. Information gained from this project will benefit goat enterprises by providing additional income through the extension of the grazing season, and reduced costs associated with out wintering goats. In addition, having the goats graze frozen ground that is normally wet, fragile, or steep, will help protect fragile ecosystems. Specifically, this project:

- Explored the benefits and limitations of browsing goats in winter by assessing electric mesh fence effectiveness, water supply maintenance, movable shelters, and, to quantify economic benefits.
- Assessed winter grazing system potential for protection and release of native plant species while controlling invasives by influencing goats’ preference for undesirable woody vegetation.
- Monitored indicators of livestock comfort and health by noting their preference for certain shelters and the inside temperatures. In addition, weight change and any mortality of goats was monitored.

RESULTS - Goats will browse woody vegetation during winter months and browsing can be managed to girdle buckthorn or honeysuckle while protecting desirable woody vegetation. Differences between grazed and un-grazed areas were observed. The goats did well having access to the larger landscape rather than being housed in yards or buildings through the winter. The farmer observed a healthier environment for the goats with this management system. Winter grazing creates an availability of feed in wetter sites during frozen winter months, sites often avoided in other seasons. Frequent use of these sites when wet can lead to health and hoof problems that do not occur with winter grazing.

November and December 2018 were fairly mild with periods of no snow. The goats were able to browse the entire 30 acre study area. January 2019 was very cold – coldest temperatures in 20 years. Thirty two below (32°F) with -65°F wind chill. February was another record breaker for snow fall amounts – three feet of snow in February alone. In addition to free access to hay and water (and goats readily ate the clean snow), 350 Christmas trees were fed, which goats readily consume.

The electro-net fencing contained the goats effectively, with few escapes during the entire project which was attributed to the goats being trained to respect the fencing prior to winter months. Fencing was less necessary with deep snow as the goats are not inclined to strike out into it. The fence was not always powered up this year as a result. MORE 🔄
The round poly-dome huts have benefits for animal comfort. They maintained comfortable temperature and humidity levels. Herd health was very good. The huts were effective in protecting the animals to -29 °F this with heat from solar gain as well as heat from animals. In extreme cold the huts were doubled (one on top of other) and the doors facing inwards in a circle at night so more warmth was held in and the goats were less likely to move to other huts where they might “pile on” and leave others without the benefit of shared heat. These huts were also easy to slide or roll to new sites.

Physical deterrents were assessed to protect native desirable plants. Steel reinforcing mesh and galvanized wire mesh, with rebar stakes, and a plastic tube system, were used to protect the trunks of vegetation. Both mesh systems were effective but the heavier concrete reinforcement mesh is reusable. The lighter weight galvanized wire was difficult to move and re-use. These methods were more costly than the plastic tubing, which was less effective, especially when placed on more palatable plants. Goats used their horns to scrape and loosen bark and scraped the plastic tubes off some trees. Nannyberry was not browsed by the goats, but nearby unprotected nannyberry plants were also untouched, suggesting that this plant is less palatable. Chemical deterrents were difficult to apply in freezing weather but may have advantages during milder weather.

**MANAGEMENT TIPS**

**Feeding Hay** - When weather was favorable, round bales were placed into areas of the field with less goat browsing pressure. Metal round bale feeders were used but the goats would bed down on the hay and not go into the shelters. Some goats were smothered under the feeder. When hay bales were put on the ground without a feeder the goats would cluster and bed down in the hay and not the shelters. The best method was to roll the bales out with the skid loader in the open areas to entice the goats to bed down in the shelters at night.

**Placing Shelters** – When placing the calf hut shelters in an area approx. 20-30 feet from each other the herd would often pick one hut and try to cram into it. When clustered together, with doors facing different directions with different prevailing winds, worked better. The best arrangement was a circle pattern of huts with the doors facing into the center. When one hut was full the goats left out would move onto the next open hut.

**Fencing in Deep Snow** – In previous years the electro net was too close to the gravel road, so it was moved farther back each year. In 2019 with record amounts of snow the road plows threw the snow farther than previously. Some of the fences were buried under five-foot drifts. Feeding and bedding the goats in the center of the pen, away from the road, they did not challenge the fence as they did not want to plow through deep snow. Protein lick tubes were placed in the center of the pen to help ride out storms and keep the goats in an area when the skid loader and snowmobile (!) were getting stuck.

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A Networking Group of the Sustainable Farming Association of MN ([www.sfa-mn.org](http://www.sfa-mn.org)), the Ecological Service Livestock Network (ESLN) seeks to develop business models and advance the art and science of profitable livestock-based, land management businesses, with emphasis on but not limited to urban, suburban and peri-urban landscapes. This group is tailored toward land management professionals and agriculturists to promote the use of livestock to control invasive species, restore ecological functionality, reduce the use of pesticides and fossil fuels, and facilitate profitable livestock-based businesses - [www.sfa-mn.org/ecological-service-livestock-network](http://www.sfa-mn.org/ecological-service-livestock-network)