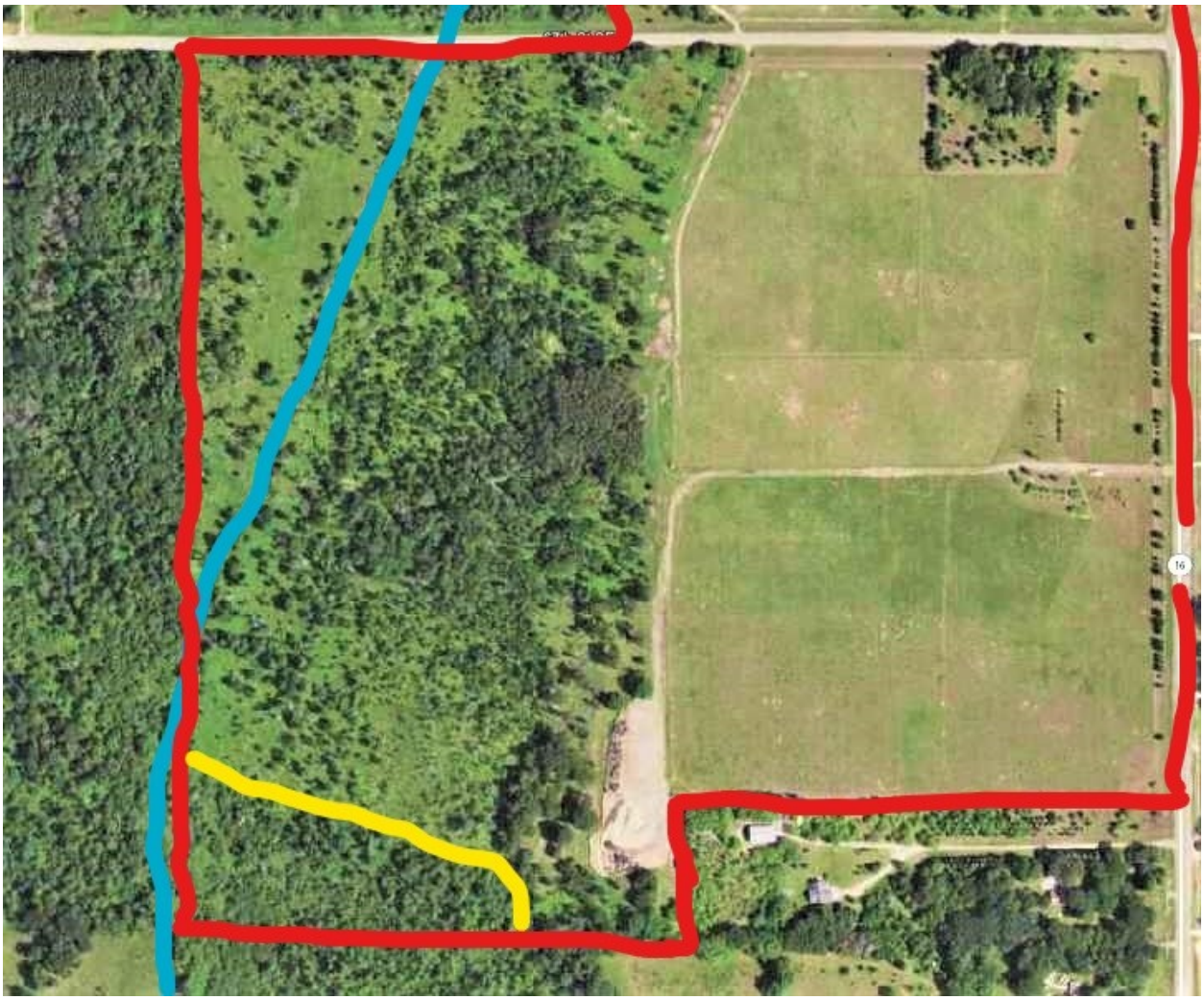
Savanna Restoration a Multi-year Project. Winter 2021 Update
This is the fourth in a series of yearly articles on this topic.
I will repeat some introductory information from those previous writings. To see the previous articles, scroll back on our Facebook page.
In this article I will report ongoing work and progress, using text and photos.
The goal of this work is to restore savannas to our Snake River Farm in the Anoka Sand Plain of Central Minnesota.
The purpose of savanna restoration is to improve the general health of the biome, including soil, water, microorganisms, insects, wildlife, plants and farm animals.
The method of restoring these overgrown woodlands and farmed out cropland includes
1. Severe, selective thinning.
2. Winter bale grazing with bison, cattle and sometimes sheep.
3. Forage inter-seeding as needed (especially with legumes) to achieve a healthy and vigorous sward.
4. Carefully managed rotational grazing.
5. Tree and shrub planting in open areas that were formerly tilled fields.

A savanna is a grassy terrain with spaced trees and shrubs. The trees and shrubs are spaced such that at least 10% but not more than 50% of the ground is shaded. In the north central US, the dominant savanna trees are White Oaks. The most common savanna shrubs are fruit bearing trees such as wild cherries and crab apples.
This combination of acorn producing oaks, fruit producing shrubs, with underlying grasses and forbs is one of the most productive natural systems on earth.
A productive savanna provides food and habitat for a great variety of birds, animals, insects and soil building microbes.
Worldwide, savannas are one of the most common and most productive natural landscapes.
Top soil is a combination of mineral particles and carbon.
Rich topsoil is high in carbon. Stored carbon makes soils black.
Soil carbon feeds soil microorganisms. Soil microorganisms produce the nutrients that plants need.
Topsoil can store incredible amounts of carbon.
Topsoil is the basis of human civilization and of our green planet.
In general, forest topsoils are thin.
Prairie or savanna topsoils can be much deeper.
Savannas can store terrifically more carbon than forests.
Savannas are pleasing to humans. Most parks and playgrounds are actually savannas.
In nature, savannas are produced primarily by free roaming, grazing animals in temperate climates.
Prehistorically, bison and elk herds produced a broad swath of savannas from Texas to Canada.
Until the 1970s, the small farms of mid-America maintained savannas as pastures.
Most of those small farms have disappeared.
Many savannas have been cleared and converted to continuous cropland.
Many other savannas have become overgrown with brush and weedy trees.
You can easily spot thousands of small savannas if you know what to look for. You can identify an overgrown savanna by looking for “open grown” white oaks. Those white oaks are now crowded by younger trees and bushes.
An “open grown” oak has horizontal or lateral branches. Those branches, which are now shaded, grew when the oak was standing in the open.



The first photo is an arial view of the southern 140 acres of our Snake River Farm. The farmstead, which is not shown, is on the 90 acres of the farm that is north of the gravel road. North is upward in the photo.
I have outlined the farm with red.
The photo was taken in 2019. It does not show the work we have done since then, but I think the photo conveys the point.
I marked the Snake River with a blue line. It runs through the wooded and low land at an angle.
The wooded half, on the left, is 75 acres.
The right half of the photo shows the 65 acres of formerly open fields.
The yellow line in the lower left marks off five acres of Tamarack swamp. We do not graze that at all.
The wooded pasture is fenced and cross-fenced into six paddocks.
The east 65 acres are divided into 30 paddocks. Each of these upland paddocks is grazed for only one or two days, then allowed four to eight weeks of rest and regrowth. Keep in mind that there are numerous paddocks north of the upper, gravel road.
Short duration, intense grazing followed by long rest periods best mimics nature's way. The pastures do splendidly and are most productive when managed in this way.
All paddocks have drinking water supplied through plastic tubing.

I think you can see the substantial difference between our wooded pastures and the unmanaged neighboring woods to the west and south.
Our wooded land has much more forage for grazing. The land has been thinned and groomed by 25 years of careful grazing and mechanical thinning. There is much more to do, but the productivity of our wooded land has increased many times.
The savanna aspect of the pasture Increases plant diversity, wildlife habitat and carbon storage.
Erosion is eliminated wherever a permanent ground cover has been established.
Twenty-five years ago, we planted rows of Red and White Pines along the County Road. You can see those as dark dots along the east side of the photo. We planted a number of shrubs and trees in the open pastures at the same time, but not nearly enough.
We will continue to thin the wooded pastures, leaving only desirable native trees and bushes. We will continue to select for White Oaks including Swamp White Oaks and Bur Oaks, both Red and Silver Maples, White and Yellow Birch, Cherries including Black, Pin and Chokecherry plus all manner of native shrubs.
This spring we will begin the process of planting savanna trees and wildlife thickets in the open pastures. Planting will begin in the pastures north of this photo. The trees we will plant will be primarily those that grow here naturally. Oaks, maples, birch.
Our goal is to convert the entire farm back to savanna. There are still years of work to do, thinning, planting, and nurturing.
I have some good helpers now. I hope to have my work mostly complete in five more years.
The rest of the photos are of the bison yarded up in the north portion of the wooded 75.

One photo shows a majestic, open grown White Oak that was all but buried behind weedy Red Oaks and brush.
It looks grand now.
in the other photos you can see how I tuck their winter hay in the newly thinned areas.
Before thinning the ground in these areas was 100% shaded. There was virtually no forage.
The bison eat most of the round hay bales I set out. Doing so, they stomp thousands of bale seeds into the soil, then manure and fertilize it well.
Bale grazing gives the new savanna an excellent start.
Cattle would do OK, but bison are perfect for this job.
To open these areas initially, we cut out most of the brush and 80% of the trees. In a year or two, after things settle down, and the forage plants get established, we will again select among the trees and remove half or more of those still standing.
Congratulations and thank you for reading to the end. Tom

Three bison calves and a yearling, hanging out.

There is no wasted hay. Anything that remains becomes ground cover, erosion protection, seed blanket and microorganism food.

A relaxed herd.

Young bison bull in his wonderful winter coat.