

2013: Mainframe Design Persists Despite Vegetative Setbacks

I was not able to return to the United States until the end of November 2013 to visit for Thanksgiving and Christmas. I received some updates about its state from my parents when we would video chat. Sometime during the summer, a groundhog decided to pay the garden a visit. He liked it so much that he set up set up shop for the long haul. Groundhogs love alfalfa, and our two year old, vigorous plants proved to be a very fine meal for him. By the time I arrived towards the end of autumn, almost all the alfalfa had been eaten! Our red clover probably went to his stomach too. He left after the dogs were allowed to harry him until he decided to flee under the fence. Because he had eaten most of our cover crops, troublesome species began to take over those niches.

Creeping Bermuda grass (*Cynodon dactylon*) and mock strawberries (*Duchesnea/Potentilla indica*) were the two worst offenders. Both are introduced species with Bermuda grass originally from the Middle East and mock strawberries from southeastern China. Bermuda grass is the most difficult to remove as it expands through rhizomes (underneath the ground and mulch layer) and even the smallest bit can regenerate into new plants. Bermuda grass will eventually be shaded out as the canopy closes, but in the mean time it poses a significant risk to the establishment of a diverse understory of plants that prefer fungal dominated soils, like our trees. Mock strawberries, on the other hand, are relatively easy to remove as they spread by stolons- above ground root-like structures that form



new crowns every few inches. They can be easily pulled out of well-mulched beds, but they produce many seeds in a strawberry-like fruit that birds love to eat. They are edible, but have little to no flavor. Even if they produced better fruit, their expansive tendency (that is, at the expense of others) makes them an undesirable species.

November

It was clear that, by fall, the Bermuda grass and mock strawberries had done a number on closing down diversity in the garden. While many of our perennials were left standing, the choking rhizomes and stolons of both species could be found everywhere. Still, the bones of the system were intact: the comfrey and horsetail nutrient nets were going strong, organic matter was accumulating- though at a lower rate- and the overall vigor of the system was evident; especially in the trees. While I do not have any caliper measurements of the trunks, they looked like they had grown about three feet (1m) in each direction!

The main priority for this trip was to remove as many of these problem species as possible, better delineate the beds, and provide encouragement that the garden is moving in the right direction despite the setbacks in the herbaceous layer. Taking a closer

Photograph 4-1 The garden upon arrival. Despite autumn temperatures, many of our perennials continue growth. November 27th, 2013

look at the soil development in beds, as well as the swales, was enough to show my family that soil organic matter, and thus health, was improving.

As much as I wanted to get started right away, work in the garden, beyond poking around, would need to wait until after the Thanksgiving.

Photograph 4-2 Eastern edge of the second/lower swale. Comfrey and French sorrel holding on, with a thick mat of mock strawberries in the background. November 27th, 2013





Photograph 4-3 Western edge of second/lower swale. Cleaned up the pathways first, lopped bamboo canes into smaller sizes and strung borders for the garden beds. December 5th, 2013

December

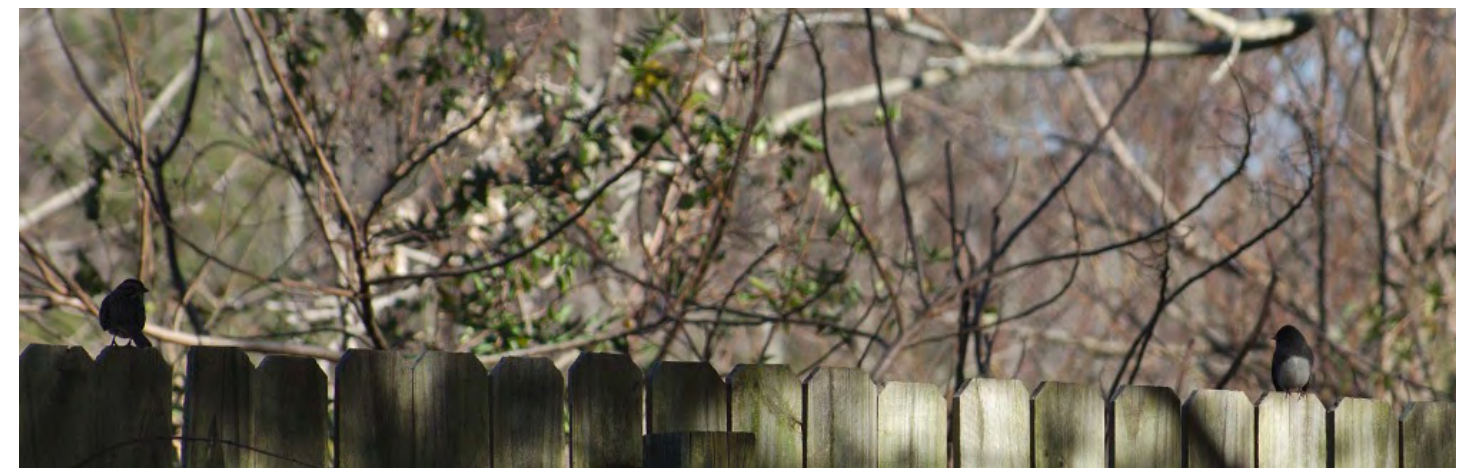
Step one towards getting a handle on the undesirable species was to clean up the pathways. Regular old lawn grass was growing quite well on the paths under a thin layer of pine straw, so I went along each pathway using a serrated rice sickle (one of the best hand tools) and cut them back to ground level. Once collected into large piles, this grass was put underneath the south side of the oak tree to sit in the sun and dry out for use as mulch. With the pathways clear, I needed to find the edge of each bed and make those clear too. We still had bamboo canes from 2011 that were in working order, so I lopped them into regular sized pieces and sunk them into the edge of the beds.

Then, we tied natural fiber twine (untreated) to one end and strung these little posts to mark the boundary. By only looping the twine around the sticks between the start and end point, the twine is easily removed and laid on the ground in case you want to work in a bed. Something as simple as this creates an impression of order and makes the garden much more coherent. As much as it would be nice to have something more substantial lining each bed,

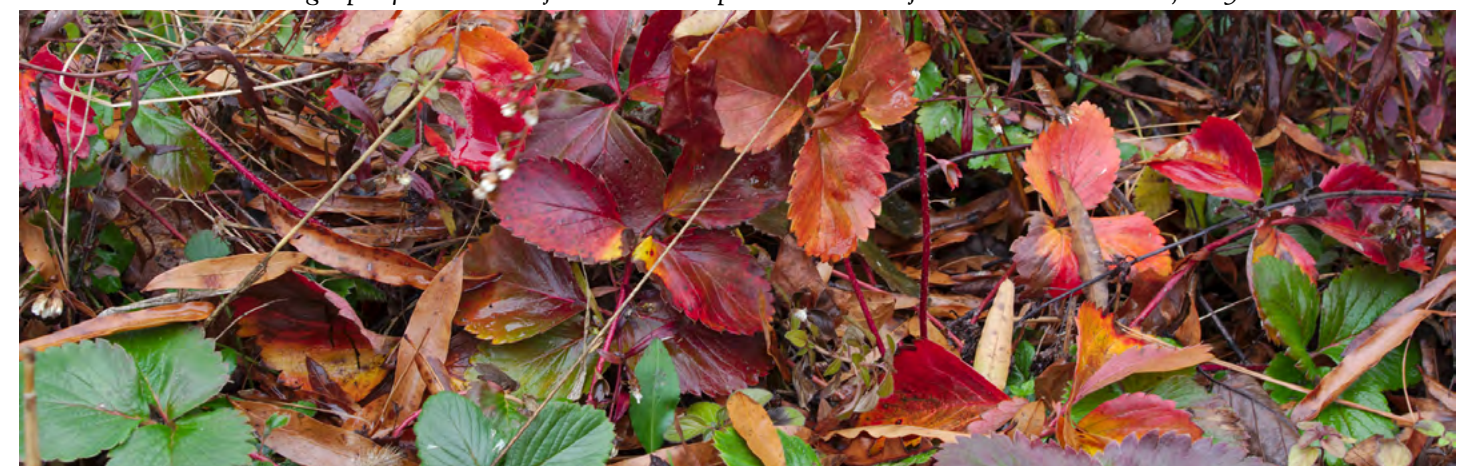
Photograph 4-4 Beds in the foreground delineated with twine, work to do in the old nightshade guild (background). December 5th, 2013



Photograph 4-5 old nightshade guild with the maple and willow. The light caught the seeds of some native asters (*Symphyotrichum novae-angliae*) quite nicely. December 18th, 2013



Photograph 4-6 Unidentified avian couple on the back fence. December 18th, 2013



Photograph 4-7 Cultivated strawberry's fall foliage (foreground of Photograph 4-4). December 5th, 2013

such an investment was not in the budget (time or money wise).

After returning from a trip to see family and friends in Florida, work resumed in the garden. The amount and intensity of the sun, even in midwinter, is quite impressive. It is little wonder that the comfrey, yarrow, sorrels, and other cold-tolerant species in the herbaceous layer can continue growing throughout the entire “dormant” season.

The hardiness of these species- the workhorses of our nutrient net system- ensures our efforts extend through as much time as possible. With mild winters and precipitation greatly exceeding evaporation, we need them to work year round. In *Photograph 4-8* the density of comfrey plantings on the swales is apparent. Additionally, the cut grass drying for mulch is by the oak tree (left) and along the temporary fence. The reimposition of borders for the beds makes gauging their size and needs easier.

During the course of the year, my father rerouted one of the French drains to the first swale. It now fills much more often and I believe that even with the asphalt shingles potential for fungicidal residue runoff, it has made an improvement in the gardens health. We are now looking to reroute all the downspouts to swales after observing that the benefits of greater water harvesting potential

Photograph 4-8 Most of the garden from an upstairs window before rainstorm. December 22nd, 2013



outweigh our initial concerns with this particular roof.

One luxury of living in the States is the preponderance of quality weather radar. In Finland, we do not have “street level” radar analysis. Then again, we also don’t experience the same severe storms. While I am in North Carolina, I keep a close eye on incoming storm systems. On December 22nd, one such storm was certain to roll through. I managed to set up my camera on for a time lapse and record the rising water in the second swale, hoping to capture the moment when the system’s overflow pipe would engage and send water down into the upper/small pond. Unfortunately, I did not let the camera run long enough and the last photograph it took showed the second swale just on the verge of spilling into the overflow pipe. Although the overflow pipe had still not engaged when I went out to check on the camera, the upper/small pond has also risen considerably in water level because of the sheer amount of runoff from the neighbor’s property. This is a key observation in that water from the second swale should be diverted one more time into growing systems before allowing it to enter the small pond; otherwise the pond will simply overflow even faster into the wetland system, which will result in the loss of many gallons of water.



Photograph 4-9 First/upper swale full and old green guild cleaned up. The French drain can be seen protruding from the soil bottom center (gray/brown tube). December 22nd, 2013



Photograph 4-10 Lower/second swale filling with water in an hour and a half of rainfall, to within an inch of engaging the overflow pipe installed in 2012. December 22nd, 2013





Photograph 4-11 Our water holding capacity will increase as the organic content of the soil improves, but the sheer amount of run off overwhelms current capacity. December 23rd, 2013



Photograph 4-12 Runoff passing over a small branch that is meant to hold some of the mulch in place, but is failing to do so. December 23, 2013

The rain continued for a few more days, offering the chance to witness just how much water we still could be capturing further out in the property. Even with two swales, two ponds, Zai bowls, and a wetland system, our water harvesting infrastructure simply doesn't have the capacity to slow, spread, and sink 2.5 inches (6.35cm) of rain in two days. Two days in the middle of winter when the soil is already well saturated and most plants are not growing. I should also remind readers that 2.5 inches of rain equals an astonishing 31,875 American gallons (120,660l) of water in the backyard alone!

Heavy mulch does little to stop this wall of water. It then puddles near the basement's paved foot before accumulating enough to exit out the back fence. It is there, behind the fence, that many more gallons could be put to use watering the slope where we would like to plant an evergreen windbreak. The water could be gently nudged into the swale that runs along the north slope of the berm beyond the fence.

Managing even ephemeral water movements like this should be considered very carefully. Eventually, the water will win. So trying to completely stop this water is perhaps not the best

course of action. As this mulch breaks down into humus, more plants will be able to put down roots. Perennial vegetation underneath these trees will be one of the best options to help us prevent more erosion from taking place. Remember that this patch of ground was completely scalped of even its lawn back in 2011 and so is in the process of recovery.

More vegetation to slow the water as it moves through the ponds and wetland system will be critical to preventing the water from gaining too much momentum. Ultimately, though, there will be a small stream of water here as long as the neighbor keeps on with the same landscape management. It is, after all, the lawn adjacent to us with its bowl-like landform that channels all of this water down to the little valley without any kind of impediment. If a system of water harvesting were implemented on her property, the amount of water moving across the surface would be dramatically reduced. Instead of running off both of our properties, both backyards could benefit from increased infiltration and a moderation of this precious resource. Perhaps sometime in the future more homeowners will take responsibility for storm water from their properties instead of necessitating large outlays of public funds

Photograph 4-13 Runoff reconfiguring the mulch under the river birches. December 23rd, 2013



on expensive storm water systems.

The garden was spared any more rain for four days, during which time the swales infiltrated their captured water entirely into the soil and the ponds had discontinued overflowing. The winter sun broke out from the clouds before my departure and illuminated the entire garden early in the afternoon.

2013 Visit Conclusions

Often overlooked or simply glazed over, I believe that having clearly delineated and nicely cut pathways strongly conveys a message that this is an active garden and not a lawn abandoned to its own devices. Even if polycultures grow unruly and break with all convention, a coherent set of maintained pathways is something everyone can understand. The imposition of twine boundaries to the beds also makes the estimation of size and time commitments easier. Regular, geometric forms that do not inhibit the growth of the plants are simply easier to comprehend. As mentioned earlier, these twine boundaries can easily be unlooped from their stakes when work needs to be done. Pathways are critical pieces of infrastructure in a regenerative approach to gardening. Free for all access is a recipe for disaster on a small scale. If the space dedicated to the living

components of the ecosystem is not respected, soil, water, and plant health all decline. Recovering their position in the garden was important work.

While it may not seem like much, the tasks that we accomplished would prove to be quite helpful in holding back the worst of the Bermuda grass and mock strawberries in the coming 2014 season.

Photograph 4-14 In a cooler winter, more of the garden lies dormant. December 28th, 2013



Photograph 4-15 Looking north from the southern gate. December 28th, 2013



Photograph 4-16 A well defined pathway with the working node's stakes untethered for a task. December 28th, 2013

