

Farmscape Management Thoughts for Hawthorne Valley Farm

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General Considerations

Farming is a balance between providing food for humans and natural habitats for native species. In some cases, there is a direct inverse relationship with productivity increasing and natural habitats decline; yet, there is also middle ground, where productivity is adequate and natural habitats are maintained or even improved. Farming in our region, be it organic or conventional, usually reduces native species on the land that it uses most intensively. The trade-off is, obviously, that these areas are most productive for food. Native species tend to occur in the interstices of production – in the lightly used hayfields or pastures, along the vegetated stream margins, in the shrubby hedgerows. In fact, some of these areas provide crucial habitats for regional, openland native species. Considering on-farm nature conservation boils down to considering the overall style of farming and its intensity. Farming that literally leaves some space for nature will have higher conservation value; farming that must use every square inch of farmland to its maximum will have less.

The relationship between production needs and available land is central to understanding a farm's nature conservation potential. Thus, we believe that having adequate land is the foremost requirement for maintaining Hawthorne Valley Farm's conservation value. While we cannot ourselves define how much is "adequate", we urge the Farm and Association to think ahead in terms of upcoming production needs and requirements for housing and other construction. As the Farm is increasingly surrounded by development, it is crucial that it has sufficient land at hand.

Hawthorne Valley Farm is already farming organically. The style of farming, organic vs. conventional, may affect those native species using the intensively-farmed lands and can influence the 'beyond-the-fences' damage that might come from, say, herbicide or pesticide drift or run-off. We believe that one of the next steps in ecological farming, together with pursuing on-farm energy/nutrient self-sufficiency, should be the habitat approach we try to outline here. The central question essentially evolves from 'are you poisoning your environment with chemicals?' to 'are you doing what you can to support those native species compatible with or even dependent on farmland habitats?'

Given their role in food production, is it reasonable to ask farms to play a role in nature conservation? We believe it is for at least three reasons:

First, productive farms still control a significant portion of our landscape and offer one of our best chances for developing a socially-conscious approach to land use. Private, domestic lands (the major competing land use in our region) are usually managed according to the landscaping inclinations of the particular landowner and are only rarely managed according to any broader social and ecological benefits. Farmers, as food

producers, already have a ‘social contract’ of sorts, albeit not always one that explicitly includes landscape management. However, in our region at least, farms play an important role not only in producing food but in shaping the landscape in socially-appreciated ways. Surveys that ask residents what they like about our region often find that “rural character” tops the list. The value of farms in creating “rural character” has been more widely accepted in Europe than here, where our current land-rights philosophies tend to be framed at the individual rather than societal level. Farms can potentially play an important role in ‘setting the style’ for responsible use of the landscape, although mechanisms need to be developed for insuring that farmers benefit from this contribution.

Secondly, as we have personally tried to document, farmlands are home to a variety of native organisms that would likely disappear from our landscape were farms to disappear. These are mainly openland creatures which would lose habitat were farmland to revert to forest or be developed into housing. Prior to European colonization, many of these organisms found habitat in naturally disturbed areas (e.g., those affected by beaver, natural flooding, or fire); those disturbances have declined as we control beaver, other flooding and fire. Some openland organisms were probably not historically common in our area and had their demographic heartlands farther west on our native grasslands and savannahs. Many of those prairie habitats have since been largely destroyed and so northeastern grasslands now make a greater relative contribution to maintaining these species at the continental scale. According to this logic, certain types of farmlands are nationally important native habitats that bear conserving in their own right.

Finally, we believe that Hawthorne Valley Farm should play a role in nature conservation for a more particular reason – education. Because of its association with Hawthorne Valley School and Visiting Students Program, and because of its interaction with the public, the Association lands that the Farm uses are also, actually or potentially, outdoor classrooms for students and other individuals. This should not be seen as motivation for converting the Farm into a “petting zoo”, but it should be seen as reason for insuring that the Farm’s lands well illustrate a landscape that is viable both agriculturally and ecologically. Work can be done to make that role more explicit in the Farm’s mission and in its interactions with students and the public.

In the sections that follow, we will focus on specific management ideas. We will identify certain areas of the Farm as being particularly valuable habitats from a nature conservation perspective, and identify certain practices as particularly relevant to this issue.

On-farm Habitats of particular Nature Conservation Value

Shrubby Pastures

Location: North Field 3 & 4; Steephill; portions of Indian Valley. These are marginal pastures which are grazed occasionally, but where grazing pressure alone is not sufficient to prevent the growth of shrubs and, eventually, trees. (See map of “Shrubby Pasture”).

Nature Conservation Value: These pastures offer a surprising (at least to us) range of habitats to native species. They provide documented habitat to shrubland birds. These are bird species which rely on early successional, shrubland habitats; as a group these birds are declining significantly. Several native openland species of plants also occur in such pastures, these include native grasses and orchids. We have also found at least one native species of butterfly which is tied to these habitats.

Threats: Because of their marginal production value and because they are well on their way to becoming forest, the temptation is to either use these lands for something else (e.g., housing) or let them grow back into forest. However, their unique ecological value comes specifically from their intermediate successional status (i.e., they are neither wide open nor grown in). Complete clearing or reversion to forest destroys this.

Suggested Management: These areas must be actively managed. If not, they will gradually become forest – habitat with less agricultural value and regionally less unique in its ecological value. We recommend rotational clearing where shrubs are cleared from a given portion of a pasture every five years or so. Initially, this would involve partitioning the given pasture into management units, cruising for larger growth that perhaps would defy the brush hog or the goat, and then, starting with the most mature sections, initiating clearing.

From a habitat-impact perspective, we don't have strong preference between browsing and mechanical clearing. From a holistic perspective (and because the public might be interested in utilizing "Green Goat Landscapers"), trying to establish a working goat herd would be interesting. However, this obviously involves substantial additional animal-keeping logistics. Clearing should occur in late summer or autumn, after birds have finished nesting. Ecologically, winter would be an ideal time of year for clearing, but that may not be practical.

Follow-up: Fields should be monitored for their ecological evolution. For example, what age of cuts do our grassland/shrubland birds most favor? Does rotational cutting really serve to maintain habitat for them? How is the extent of Little Bluestem (one of our native grasses) affected by these practices? Is control of invasive Knapweed necessary to maintain Little Bluestem?

Wet Meadows

Location: Our most extensive wet meadows occur along the drainage from the base of Steephill, by Faust's Finger, and south of the crossing of the Atelier Cattle Lane; just West of Red Maple books; and in North Field 3. Furthermore, there is lesser amounts of wet meadow habitat around the West Hill cattle pond, in the lower portion "New West Hill" field, and around the North Field cattle ponds. Many other pastures also have wet spots. (See map of "Wet Meadow").

Nature Conservation Value: Like other on-farm habitats, wet meadows are special because they do not maintain themselves. If no grazing or clearing occurred they would slowly revert to wooded wetland (a nice habitat in its own right). Prior to colonization, a

dynamic mosaic of beaver meadows was probably the primary factor maintaining regional wet meadows. Later, colonial farmers realized the nutritional value of wet meadow hay and, before the advent of extensive fertilization and green manure, such meadows were valued hay fields. However, as cutting technology and nutrient management evolved, wet meadows became less valuable agriculturally and were often drained when possible. There are a set of native plants and animals which require wet meadows. Our own work has identified a variety of plants and butterflies as largely confined to wet meadows. We have also found Spotted Turtles and Ribbon Snakes in Hawthorne Valley wet meadows. Both of these species are considered regionally rare.

Threats: As with brushy pastures, one threat to wet meadows is their low productivity. While they can be grazed, their wetness limits accessibility and makes them especially susceptible to overgrazing (which would convert them into a wallow). They are thus a habitat without a productive purpose and susceptible to being utilized for other purposes. They are, for example, sometimes the sites chosen for digging ponds. Despite their low productivity from a human perspective, they require maintenance because natural processes will tend to convert them from meadow to woodland. At the same time, too much grazing and associated trampling can also damage a wet meadow. If ample alternate pasture is available in a given paddock, they should be included in a grazing rotation; however, cattle should not be yarded in them.

Suggested Management: We believe that our different wet meadows warrant different management approaches. The wetland off of Faust's finger, for example, is not really practical to graze and is linked to a fine wooded wetland in the adjacent forest. Letting it be, even if it means slow reversion to a wooded wetland seems best. However, the wet meadows farther up (i.e., at the base of Steep Hill) and down that same drainage, on West Hill, and in the North Fields should continue to be grazed as they have been. At some future point, it may be necessary to cut out some woody vegetation, but that does not currently seem pressing. Things seem to be working relatively well as they are, and grazing pressure should not be increased or decreased substantially.

Follow-up: Keep an eye on woody plant growth and ensure that reforestation doesn't occur. In the case of the Faust's Finger drainage, we should also monitor the effects of any up-stream pig activity – extensive pig disturbance could result in substantial soil erosion and down-stream siltation in the Spotted Turtle habitat.

Mature Hayfield

Location: By "mature hayfield", we mean those fields which have not been recently ploughed and seeded. They tend to have a diversity of grasses and forbs. Importantly, they are not grazed in Spring and the first cut of hay is usually relatively late. Tom's Field, and, perhaps, Bee Field, Across from Atelier, Stolfo's typify this type of habitat. Many of the larger Iselin hayfields also are examples of such stretches. (See map of "Mature Hayfield").

Nature Conservation Value: While most of the plants that one sees in a hayfield are European in origin, some native species do sneak in. In terms of plant species, up to 50% of the plant species in some fields may be native. Mature hayfields are most commonly heralded as habitat for grassland birds – Bobolinks, Meadowlarks, and Savannah Sparrows all use some of our hayfields. During some seasons, these hayfields may also have a nice spread of wildflowers and host numerous nectaring butterflies.

Threats: These fields do not stay fields unless they are regularly cut. Aside from disappearance, their ecological value is being threatened by increasingly early hay cutting. In the mid-1900s, hay cut did not usually *begin* until mid-July. This gave time for birds to fledge and some native plants to go to seed; cutting that begins in May prevents that. Ploughing and reseeded can further destroy some ecological aspects of these fields..

Suggested Management: Mature hay fields which support grassland birds should not be cut before early July. We're not yet sure how constant birds are in their choices of fields although bobolinks and meadowlarks have been fairly consistent in their choices during the past three years. Nonetheless, a simple field walk in late May or early June can quickly give you an idea of which birds are around. Marking nests and mowing around them, aside from being labor intensive, is not reported to be very successful. It is worth reiterating the importance of access to ample land – if all hayfields must be harvested as efficiently as possible, there is unlikely to be room for grassland birds.

If ploughing and reseeded becomes necessary from a production stand-point, it should be part of a multi-year rotation which insures that sufficient mature hayfield remains in any given year.

Follow-up: Periodic early-summer checks for Bobolinks is both easy and useful. These are noisy, uniquely marked birds and with only a bit of training become conspicuous. This information useful as a gauge of management success and to allow for spontaneous changes in field choice by the birds.

Riparian Corridor

Location: “Riparian Corridor” is the term given to the area associated with streams or rivers. The corridor includes not only the water itself but also the associated, stream-influenced vegetation. A somewhat broken-up stream corridor exists along the Farm Creek as it flows from behind the clinic, along side the gardens, across the cattle lane, and under 21C. The corridor along the Agawamuck as it flows through Association property is generally more intact with the important exception of actively eroding areas of the School Field. (See map of “Riparian Corridor”; we have only highlighted corridors surrounded by field).

Nature Conservation Value: Riparian corridors are valuable both as habitat for aquatic and terrestrial organisms, and as buffers controlling nutrient and soil run-off into our waters. The habitat of a stream is heavily affected by the state of the surrounding land. For example, streamside woody vegetation can help provide structure, nutrients (e.g. through falling insects and debris), and shading. Streambanks and associated floodplains

can host wet meadow and shrubland species of interest in their own right. Certain animals, such as mink and kingfisher, spend much of their time in such habitats.

Threats: Clearing of streamside vegetation in order to expand farm area. Much of our regional farming has occurred in the valleys and hence has overlapped with stream beds. Smaller streams have often been straightened and confined (the Farm Creek is an example). The clearing of streamside vegetation tended to increase rates of soil erosion, resulting in siltation of stream bottoms and further habitat alteration. Such active erosion is visible in the northeast corner of the School Field.

Suggested Management: Maintain and where possible enhance streamside vegetation. It would be nice to continue the formation of a wooded corridor through the meadow south of the main cattle crossing so that it can link up with the corridor beginning to form along the base of the rise to the Atelier field. Siltation is noticeable as the Farm Creek passes through the Farm. Part of this may be due to the cattle crossing, although the crossing area seems relatively rocky. Some may come from erosion occurring in the pasture just below the Atelier Field but above the Creek where it might be appropriate to fence cows out of the most heavily affected areas. If pigs are housed streamside, they can increase soil and nutrient run-off, and destroy riparian vegetation.

Left to its own devices, most riparian corridors will reforest. Planting native trees and shrubs would not hurt this, but probably is not usually necessary. The main site where active intervention might be needed is in the northeast corner of the School Field where the Agawamuck has been eating into the streambank. Bankside stabilization, perhaps coupled with some re-channelization, is appropriate here to control this erosion. If immediate results are desired, a professional engineer should be consulted. Otherwise, a combination of active replanting of a wide margin of that area, combined with tolerance for stream wandering would probably eventually result in a more stable situation. Streams do wander naturally and major ecological changes can occur when efforts are made to prevent this.

Follow-up: In most cases, there does not seem to be the need to actively monitor streamside vegetation; it can be left to do its own thing. Probably most important is to keep an eye out for erosion by studying the landscape and by periodically checking the creek bottom at various points downstream from farm activity. Substantial erosion will show up as a muddy stream bottom.

Woody Hedgerow

Location: Scattered throughout. (See “Woody Hedgerow” map.)

Nature Conservation Value: Hedgerows have received a fair amount of attention in the on-farm conservation literature. In part, this is because in largely cleared regions of the West or of Europe, they may provide rare pseudo-woodland refuges or crucial corridors. In our area, where forests now abound, their relative value may be lessened. Hedgerows can serve as shelter and food sources for certain native species such as the nearly-endangered New England Cottontail and various shrubland birds. While we don’t believe

that their value is as unique as that of the preceding habitats, they do contribute to enlivening the farmland because they can provide shelter not just to pests but also to some agriculturally-beneficial birds, snakes and insects.

Threats: Clearing. The general trend has been to remove hedgerows because they make farmland more difficult to use with large machinery and may harbour groundhogs and rabbits. The highway department and electrical companies seems eager to clear hedgerows along highways, perhaps to improve visibility and reduce threats to lines.

Suggested Management: Where appropriate leave woody plants in place. When removal of multiflora rose is useful, do it after the bird nesting season, and leave other, native species in place. Once trees begin to become established in a hedgerow, multiflora rose appears to decline. We believe that targeted groundhog control, as is currently being done around the garden, is the most appropriate way to minimize damage. Destroying their habitat or destroying them elsewhere on the Farm should be only a last resort.

Follow-up: Early-autumn bird nest hunts are a fun way to get people out and realizing what farms can provide to native species.

Special Issues

Human Use

Trails and other human activity obviously do impact the land. However, we believe that it's crucial for people to be able to enjoy the landscape so that they will care enough about it to consider conserving it. On the farm side of the road, it would be nice to lay out a public path. The course of such a trail would need to be well-coordinated with farm logistics. Just to start the discussion we've attached a map for a proposed path that would let people see some of the nicest views of the farm and take an enjoyable hike. (See "Farm Path" map.) It should probably be located along pasture margins where a narrow strip could be fenced off from the herd and easily mowed. We have broken the path up into several smaller loops so that visitors can choose the extent of their hike. This path could also serve as an alternate route for people traveling to the Farm from May Hill or the Atelier.

There is already a network of trails on Phudd Hill, and this area is used by a variety of programs. We believe that the key criterion for assessing the suitability of such use should be whether or not it helps connect students, campers, or others with their surroundings. Many of the programs currently using the hillside fit this profile. On the "Sensitive Woodlands" map we have highlighted some woodland areas that we feel are particularly sensitive due to the presence of wildflowers, vernal pools or other features. This map is not exhaustive. We believe especial care needs to be taken in any use impacting these areas.

Perhaps the most pressing issue is currently "trail creep". As trails are used more and more, especially after rains, they tend to widen as loops are made around wet spots. In

time, such widening and wear can substantially impact the area through which the trail passes. Such a process is occurring at various spots along the Phudd Hill trail system (two such points are indicated by red dots on the “Sensitive Woodlands” map), and some form of trail management is probably appropriate in collaboration with the other groups using the Hill. The increasing use of the area below the Fire Pond also threatens to slowly expand into the surrounding woods.

Water Quality

The major self-generated problems affecting water quality on Hawthorne Valley Farm appear to be sedimentation, nutrient enrichment and bacterial contamination. Given that the waters of the Farm Creek flow along the Taconic State Parkway prior to arriving at the Farm, there is also the possibility that they are contaminated with road run-off including salts and car pollution. Testing for such contaminants is expensive, but might be worthwhile since these are our irrigation waters.

Sedimentation is discussed in relation to Riparian Corridors (above) and Pigs (below). Nutrient enrichment likely comes primarily from manure, although septic system leakage and dairy facility run-off may also be important. Microbial contamination may likewise be ascribed to the first two possible sources. While enrichment levels measured to date are relatively modest, certain precautions such as *locating compost piles at some distance from creeks* and restricting livestock access to streams seem reasonable. When pigs are confined to stream corridors, stream contamination is likely to increase.

During at least certain seasons, the Agawamuck showed surprisingly high level of microbial contamination. Some of this apparently arrived from upstream, however in two out of three measurements, microbes increased as the waters moved past the School and continued out of HVA property. Because animal access in the School area is slight, the possibility of leaking septic systems should be considered.

Pigs

From a nature conservation perspective, there’s not an obvious justification for “pasturing” the pigs. Locating pigs outside of the barnyard will tend to result in vegetation destruction and water contamination. If such foraging reduced the need to feed pigs or accomplished necessary vegetation management, it might have mitigating values. If it is decided to pasture the pigs, then we recommend relatively dry areas where access to water is limited. Access to pond water is preferred over access to stream water, because the former can help retain sediments and nutrients whereas the latter allows them to flow easily downstream.

Invasive Species

The invasive species that might deserve most concern on Association land is **Japanese knotweed** which has established itself in approximately a dozen little colonies along the shore of the Agawamuck. **Japanese knotweed** is a tall, bamboo-like plant with heart-

shaped leaves that has been introduced as a garden ornamental and is now very aggressively invading natural areas, often along water courses. An example can be seen from Ben Ocean's bridge looking south along the eastern shore. If unchecked, **Japanese knotweed** will certainly spread further along the Agawamuck and might eventually come to dominate its banks. A concentrated effort over several years might be necessary to avoid the spreading of this highly successful invasive. We recommend mapping of established stands, followed by their repeated cutting to avoid expansion of established stands and dispersal of vegetative material or seeds to new sites. The creek also needs to be monitored for new growth of **Japanese knotweed**, which can be eliminated while the colonies are small by digging out the roots.

In some wetlands, such as the one at the base of Steephill and around the Firepond, we have a few plants of **purple loosestrife** which should be monitored and not allowed to spread extensively. At the current densities, it might be sufficient to cut the flowering plants around early to mid August to avoid seed formation and dispersal. Claudia has already begun to remove it from the Farm's wetlands.

A well-recognized nuisance on the Farm is **multiflora rose** which spreads quickly in hedgerows and into meadows. Two other invasive shrubs found in the hedgerows and spreading into meadows are **oriental bittersweet** and **autumn eleagnus**, which merit monitoring and might get cut at the same time the multiflora rose is being controlled in an area.

An invasive species that might merit more concern and active management is **spotted knapweed** which occurs in particularly dense populations on the dry hill-side meadows of Hawthorne Valley Farm. This species produces a chemical that inhibits the growth of other species in the immediate area and might well contribute to the degradation of these already marginally productive meadows. Its population dynamics and interaction with more desirable native species, such as little bluestem, might be an interesting subject for further study at Hawthorne Valley Farm.

Garlic mustard grows densely in the alluvial forest along the Agawamuck and might in the long-term have a negative impact on the exceptionally rich spring flora of that forest. This garlic mustard population might be another fruitful subject for further study and experimentation.

Finally, throughout the forests of the Association, one might consider the elimination of the **Norway maple** trees and the **Japanese barberry** bushes. Caution should also be taken to avoid planting new invasive species on the grounds.

Water chestnut is an invasive aquatic plant that gets dispersed by geese and can cover the surface of a pond within one season. Such extensive shading can prevent photosynthesis of underwater plants, killing them and reducing oxygen content of the water. Ponds should be monitored and water chestnut removed whenever it is spotted. Currently, it is covering much of the surface of the west-most pond in the North Fields. Ben and Sarah might research the marketing potential of water chestnut fruit, although

the species we have here is the Eurasian water chestnut, *Trapa natans*, rather than the more commonly consumed Chinese water chestnut. We can help with the harvest...

Energy & Nutrient Self-sufficiency

There is not much we can say on this topic, because there is not much that we have personally done. However, just as the agrochemicals released by conventional farming have been seen as a threat to the greater good of the people and ecology of the land, so too are the hydrocarbons utilized by organic farming contributing to problems for our region and planet. We can only say that we are realizing that this is one of the important future issues for farming to deal with, and we would be glad to work together with the Farm to see how enhanced self-sufficiency can be incorporated into the farmscape. What would such a farmscape look like? What would it provide in terms of habitats? How can we make a functioning whole? This would involve not only considering direct fossil fuel use, but also the natural resources associated with supplies such as remay and haylage wrapping.

In sum, we believe the Farm and Association have generally done a good job managing the land. Above, we have highlighted both long-term (the need for adequate land) and more immediate considerations (the specific management recommendations) that we believe would build on the existing land management. Not only is such management in and of itself important, but it is also important that it is shared with the public. Such sharing provides public enjoyment. It also ensures that our lands contribute to the formation of the public's perception of good land use – a crucial educational contribution given current land use trends.

Note on the Maps: The maps below accompany the above text and our generally referred to by name. The base map is a generalized habitat map of Hawthorne Valley, centered on the Farm and School. Area's of particular relevance are highlighted in pink in each map. Some areas outside of Association property are included in order to provide an idea of ecological context; obviously, their management is up to their owners.



