

Sun One Organic Farm Zones of Use Data/Discussion

50 Maddox Road Bethlehem, CT 06751

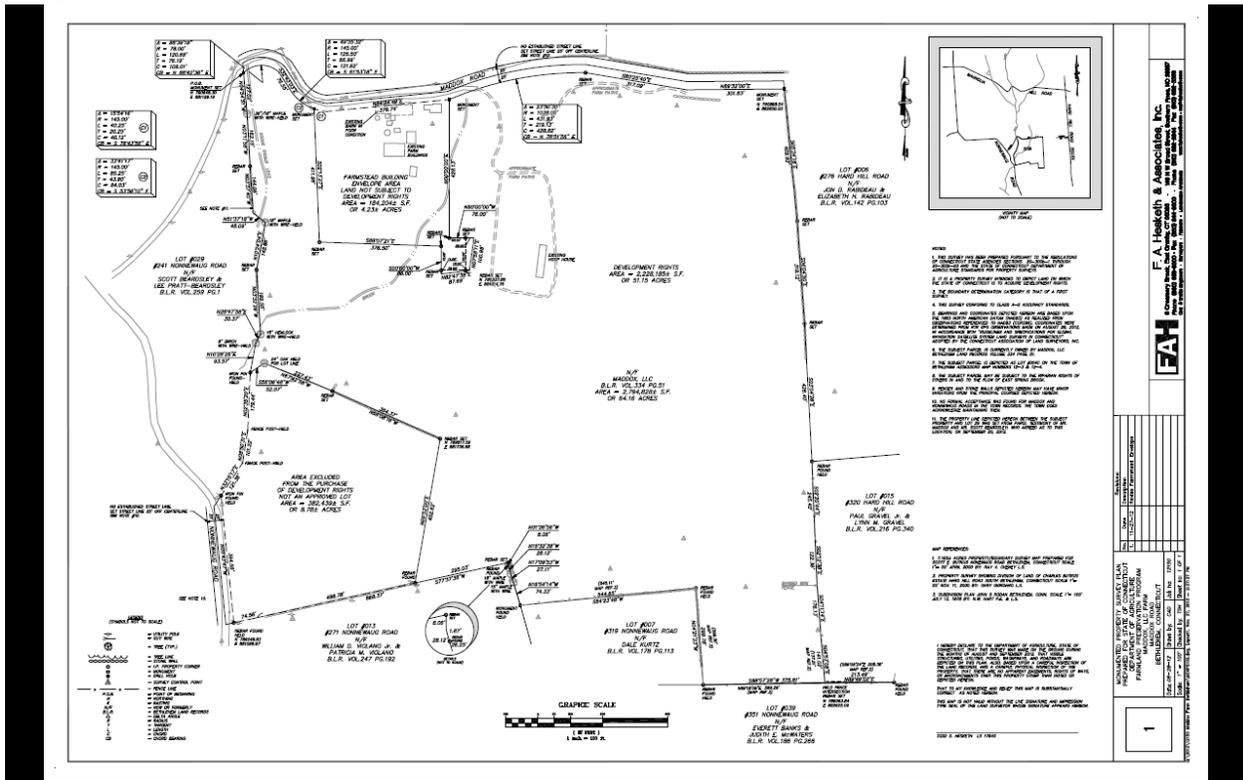
Abstract: This document aims to put Sun One Organic Farm into a Permaculture perspective. This particular perspective is related to zones of use on the property. The goal of the document is to provide information on the areas of use occurring on the property. There will be a discussion on the end with aim to provide appropriate parameters for Permaculture design on the property.

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Property Lines, Easements, Rights-of-Way

The survey done by F.A. Hesketh and Associates illustrates where the property lines are. It is pictured here:



The survey also illustrates what parts of the property are subject to an easement. The majority of the property (51.15 acres) is in conservation. Finally there are no rights-of-way on the site except for Maddox Road, which requires a 50 foot right-of-way. The length of the right-of-way that encroaches on the site is 6 feet.

Existing Zones of Land and Water Use

Land

There are currently four types of existing land use on the site. These four types are the primary growing area, secondary growing areas, hay fields, and unmanaged. The primary growing area is where vegetables are predominately grown. The secondary growing areas are where other crops are grown on rotation seasonally such as potatoes, squash, or more permanent crops like blueberries. The hay fields are managed exclusively in mowing; hay is mown and used on the fields, sold, or traded. The last type of land use is unmanaged, basically any area that is not the first three. These areas are the more wooded areas or wet areas of the hay fields.

Water

There are two zones where water is being used on the site and one off-site. The two zones using water are the northern half of the primary growing field and the greenhouse. The spring is the main source of irrigation on the site, so irrigation is limited by the slow recharge rate. However, rain is fairly dependable in this area and as such the plants typically have enough water. The soils are quite good at capturing and storing water in the primary growing area as well. Another water zone is the wash station located at 49 Maddox Road. This area is used to wash produce from the potable water at 49 Maddox. In the future there will be more water zones as the new well is utilized and the new greenhouse is installed.

Well Protection Zones, Environmental and Other Legal Limits

Well Protection Zones^[1]

“In 1996 the Safe Drinking Water Act (SDWA) was amended to provide communities with more information about the ways in which they can protect their drinking water sources from contamination. The amendments require states to create a Source Water Assessment Program for all their public drinking water systems. Private wells typically serving single households are not included in this requirement.”^[1] Each of the 6 states in New England have conducted their own assessments for drinking water sources.

For the most part, there are not too many possible contamination sources for the wells that are existent on the site. Furthermore, because the wells that are existent on and around Sun One are private wells, there are no official requirements for protection zones. However, we typically work with government agencies and NCRS to acquire funding for infrastructure and through their guidance, contamination will be more limited. Also, plants do not bio-accumulate microbes (such as E.coli) in their tissues, only heavy metals. Therefore, with drip irrigation there is a smaller chance for contamination of foods grown. Water tests have shown the water is clean.

Environmental and Other Legal Limits^{[2][3]}

Wetlands Regulations

“Each town's municipal inland wetlands agency regulates activities that affect inland wetlands and watercourses within their municipal boundaries. These activities, often referred to as ‘regulated activities’, are those proposed or conducted by all persons (**a.k.a Sun One LLC**) other than state agencies.”^[2]

“Regulated Activity” means any operation within or use of a wetland or watercourse or within the setback area, which is 100 feet from wetlands, 150 feet for watercourses, involving removal or deposition of material; discharging of storm water, surface water, or subsurface water; or any obstruction, construction, alteration, or pollution or tendency to pollute, of such wetlands or watercourses, but shall not include the specified activities in Section 4 of these regulations.”(Page 3)^[3]

The relevant wetlands on Sun One are the occur soils (101) which are from alluvial sources. Alluvial would designate occur soils as wetlands. The relevant watercourses on Sun One are East Spring Brook, the waterway that moves into where the proposed pond would be, and the waterway that moves through the most southern culvert.

“4.1 The following operations and uses shall be permitted in inland wetlands and watercourses, as of right;

a. grazing, farming, nurseries, gardening and harvesting of crops and farm ponds of three acres or less essential to the farming operation, and activities conducted by, or under the authority of the Department of Environmental Protection for the purposes of wetland or watercourse restoration or enhancement or mosquito control; the provisions of this subdivision shall not be construed to include road construction or the erection of buildings not directly related to the farming operation, relocation of watercourses with continual flow, filling or reclamation of wetlands or watercourses with continual flow, clear cutting of timber except for the expansion of agricultural crop land, the mining of top soil, peat, sand, gravel or similar material from wetlands or watercourses for the purposes of sale;” (Page 5)^[3]

“4.2 The following operations and uses shall be permitted, as non-regulated uses in wetlands and watercourses, provided they do not disturb the natural and indigenous character of the wetland or watercourse by removal or deposition of material, alteration or obstruction of water flow or pollution of the wetland or watercourse:

- a. conservation of soil, vegetation, water, fish, shellfish and wildlife; and
- b. outdoor recreation including play and sporting areas, golf courses, field trials, nature study, hiking, horseback riding, swimming, skin diving, camping, boating, water skiing, trapping, hunting, fishing and shell-fishing where otherwise legally permitted and regulated.” (Page 6)^[3]

Essentially there will be regulations on any kind of farming activity near the waterways but not on conservation or recreational activities. It is advised that detailed plans are created in preparation for project in these areas.

There are no zoning regulations in Bethlehem, CT.

Building Setbacks

There is an automatic 50 foot right-of-way around any roads in Bethlehem, CT. Thus buildings will need to be set back from this. The foundation to the now torn down large white barn was 1 foot away from the right-of-way according to Rob Maddox. Measurements taken from Google Earth indicate that the closest part of the foundation lies 7 feet away from the road. Thus there must be a 6 foot right-of-way on the site and a 25 foot right-of-way on the northern part of the road.

Current Uses by Neighbors and Passersby

There are nine neighbors currently surrounding the site. The two to the north that are on Maddox Road are residential. Another property to the north is used for hay and for short-time storage of hay bales. The two to the west are residential. However one of the residences to the west takes care of horses. There are two residential neighbors to the south and some hay fields which I believe belong to a third owner. To the east is a conventional farmer, who is cultivating fields, mowing for hay, and raise dairy cows. Essentially there are no uses by passersby; there are no close parks or recreational public lands.

Use History and Impacts on Land, Current or Future Uses

Historically, that is since events have been catalogued by colonists, the land that Sun One now occupies was used in agriculture. Data on use before 1898 has not been sought by the author, yet that information may elicit some interesting facts. Post-1898 the site was utilized as a dairy by Rob's great-grandfather. Subsequent generations kept the farm in dairy until roughly 2004. It is plausible that the hay fields that exist today have existed since the farm was first settled. Due to the soil composition on the site, hay fields are restricted to certain soil types while the others should be kept as woodlands. The hay fields that exist today are the maximum that can exist, and if dairy is the goal then it is only logical that hay fields will be maximized by previous farmers. An impact of this has been a high amount of organic matter (around 8% in the areas of primary and secondary growing). Another impact has been the changing landscape, of which would be entirely wooded besides some select areas.

Current use of the land is organic vegetable and small fruit production. Details have been included in many other sections of this report. Future use is expected to include more residents on the site as well as more Permaculture installments after this report is completed. The impacts of current usage are semi-permanent placement of plants. Blueberries and apple trees that have been planted are not going to be moved. The blueberry patch will continue to be a blueberry

patch, and so those plants will come to dominate the management strategy of the area. Current use of the primary growing area could be improved, as everything is subject to be.

Indigenous Land Use

The Eastern Agricultural Complex

Between the eras of the hunter gather dominated lifestyle and the arrival of *Zea mays* (Maize/Corn) in New England there was a time of small scale horticulture and agriculture where a complex of plants were domesticated and used frequently. This complex is known as the Eastern Agricultural Complex and it provides an indication of land use before settlers arrived. “Before the arrival of maize in the area, the plants used for food were entirely local species, selected for their individual merit and productivity.” (Robinson 2012) Essentially, these plants were chosen because they could produce well as a food source and were reliable.

Plants of the Eastern Agricultural Complex:

- *Curcubita pepo* (Squash)
- *Chenopodium berlandieri* (Goosefoot)
- *Iva annua* (Sumpweed)
- *Helianthus annuus* (Sunflower)
- *Polygonum erectum* (Erect Knotweed)
- *Hordeum pusillum* (Little Barley)
- *Phalaris caroliniana* (Maygrass)

This complex arose south of Connecticut, down in the area of Mississippi, Missouri, Tennessee, Kentucky, and Illinois. However, New England was eventually heavily populated by indigenous people, which means that some of these plants were utilized until the arrival of *Zea mays*. The greatest take away of this is the possibility of cultivating new vigorous crops at Sun One for experimentation purposes. Already there are a lot of Chenopods that are growing at the site and could be utilized for grain. There is also a lot of ragweed, common and giant, that grow on the site that could be utilized for raising quail.

Also quite common around the farm are oak and hickory trees, though they are not the dominant trees on the site. It is also plausible that there was fire management occurring among indigenous people as well. Fire management works well with oak and hickory which would have been managed for more nut yield. Hickory nuts and acorns provided another degree of nutrition to the indigenous diet.

Certain berries would have been present along edges as well, it is safe to assume that any kind of edible berries (blueberries, blackberries, elderberries, etc.) may have been selected for and used by indigenous people.

Relevance to Permaculture Design

Zones are integral to the Permaculture design process. Zones identify management attention given to certain areas. These zones of use teach us about what areas are being utilized for what kinds of management at the moment. So far management is sufficient in these areas considering labor and other operations at Sun One.

Conclusion

There are not too many restrictions placed on Sun One due to the zones of use. Waterways are to be designed with precaution as water is the most important thing to keep clean on the property.