An Analysis of the Environmental Impacts and Occurrences of Jones Family Farms:
A landscape Perspective

Dylan Hamme

Jones Family Farms is a 400-acre family-owned and operated agricultural farm in Shelton, Connecticut that has a long history of agriculture. The property was bought by the Jones family in 1848 and has served as both an agricultural and livestock farm until the mid-1960's when the property was dedicated entirely to agriculture.

This landscape was chosen due to my familiarity with the property and its features, and the extent was set based on the political boundaries of the farm, with some key surrounding features included as well. This serves as an effective extent due to the heterogeneity of the land cover, use, and populations that reside within. The political boundaries set a clear perimeter of a change in heterogeneity, from an agricultural landscape filled with patches and a defined matrix to clear NewEngland suburbs. There are two properties of the farm included, with a city park set between.

The farm is situated in a small stream valley with Means Brook running through and extends up the hill slopes on both the North and south sides. The north slope contains the coniferous species that grow along the slope as it extends from an elevation of about 350 ft to almost 630 ft. The southern slope is gentler and used for blueberries and pumpkin growth, it ranges from about 360 ft to 520 ft in elevation. The prominent hillslopes of the landscape highly promote runoff of the area, which feeds directly into the brook in the valley, making the dispersal

of all material and energy carried by water very effective. This includes all pesticides used in the maintenance of the farm, as well as the compost. This can have detrimental effects on biotic factors downstream including animal and vegetation health.

Contour Lines of Jones Family Farms, Shelton, CT

Soil Samples — 50 ft — 10 ft
— 100 ft — 20 ft ☐ Extent of Landscape
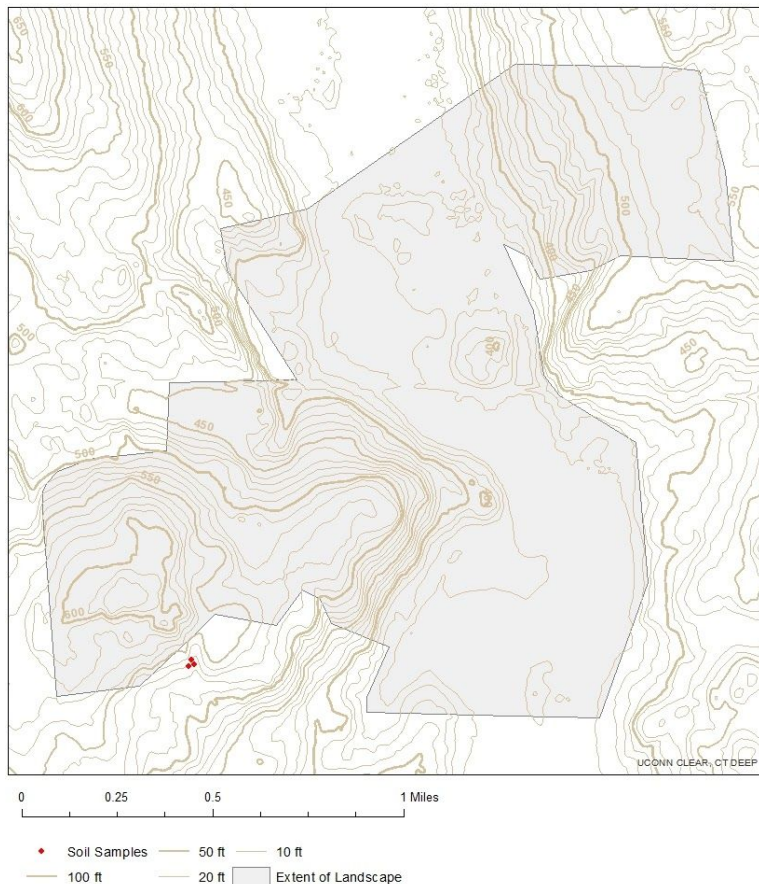
The land use of the landscape has been agricultural since the foundation of the farm, the highlands and steep slopes house different coniferous species including Blue Spruce, Balsam Fir, Douglas Fir, Fraser Fir, and Angel White Pine. The lowlands and gentler slopes allow for the growth of strawberries, blueberries, grapes, and pumpkins. The repeated annual growth of coniferous species on highland and sloped soil has naturally depleted the soil of nutrients and left it alkaline and acidic. In order for the farm to keep production high, the use of natural compost and nitrogen-fixing clover is necessary.

The land cover is perhaps the most heterogeneous aspect of the landscape, including a diverse patchwork of forested areas in a matrix of agricultural fields that are heterogeneous within themselves. The matrix is composed of the agricultural fields, meaning the short and dense coniferous stands that make up roughly half of the total extent. There is a large array of gravel access roads that run throughout the matrix dividing it into patches in and of itself, which are often separated into species of conifers. There is also a large portion of woodland that represents the natural unaltered landscape which is about one-third of the total land cover. This is found mostly in the valley, surrounding the brook that runs through the lowland. This Riparian zone acts as an important buffer to slow the movement of toxic runoff that results from fertilizer and pesticide use. There are multiple patches of woodland that are found throughout the extent, creating an intricate pattern of patch dynamics as size varies greatly as well as connectivity. There are at least six definite patches of woodlands situated outside of the large woodland area. There is a range of structural connectivity between the woodland patches, most notably the multiple corridors found between the patches, as well as very small patches that can be categorized as stepping stones, allowing for more efficient movement between patches for species that have more restricted movement, and thus the functional connectivity of the landscape is lower. There are multiple ponds within the extent of the landscape as well, allowing for multiple areas with access to water, including Means Brook that runs through the extent as well, most likely contributing to the relatively high species richness of the area. There is also a road and a minor highway that runs through the landscape. The highway plays a major role in connectivity as it breaks the farm into

two parts and disrupts the ability of ground movement within the woodland. The road also runs through the farm, but runs through the matrix, separating the coniferous areas from the lowland and woodland. This also plays a major role in connectivity as it imposes a dangerous boundary for species that migrate between the two areas.

The populations within the landscape are an important variable of interest as the heterogeneity of the landscape in terms of land cover caters to a large array of populations that are heterogeneous themselves. From what can be inferred from the map and personal experience, there are a few prominent species, the most influential being the coyote population that thrive in this landscape. The availability of a large amount of field space in the matrix that greatly suits hunting needs, combined with wooded areas with high amounts of edge space suits habitat needs as well as water accessibility, only obstructed by a highway creates a prime area for coyotes to live, especially where the matrix is a suitable area for their favored prey. There are also avian raptors that take advantage of the high amounts of edge space near the expansive fields of the matrix where rabbits and field mice are abundant. Deer are also common as well as frogs, snakes, woodchucks, and other rodents.

To study populations and population dynamics, a combination of many tools could be used including wildlife cameras set to track migration patterns in tandem with GPS tags. Bioacoustics may be used to track heterogeneity of avians and other more mobile animals. Remote sensing can be applied to analyze patterns in land cover to study favored areas of each species once applied to GIS. GIS can be used to compile the data and find patterns in interactions, migrations, behaviors, and favored habitats of populations within the extent.