

AN ECOLOGICAL SITE ASSESSMENT OF

TATTERSALL FARM

IN

HAVERHILL, MASSACHUSETTS



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Mass Audubon’s Ecological Extension Service (EES) assists cities and towns, land trusts, state and federal agencies, and other conservation partners with natural resource inventories, habitat restoration and management planning, and conservation planning. Through EES we can share the experience we have gained in managing our own network of wildlife sanctuaries across the commonwealth. For more information on EES, contact 781-259-2159 or jcollins@massaudubon.org.

Introduction

The City of Haverhill’s Tattersall land consists of 151 acres in two parcels on North Broadway in Haverhill, Massachusetts. The 84-acre parcel south of the road, known in documents and in general usage as “Tattersall Farm”, includes a farm house, gravel parking lot, hay fields and forest, and a network of walking trails (Figure 1a). A 67-acre parcel on the north side of North Broadway, known in Trust documents at the “Chase Place” and on the town walking maps as “John’s Woods”, is primarily forested with a small parking lot and simple loop trail and (Figure 1b). Mass Audubon has been engaged by the City of Haverhill to contribute to planning for improvements to the property, particularly Tattersall Farm, with particular attention to minimizing impacts on existing wildlife habitat and making existing and new uses of the property compatible with wildlife habitat.



Figure 1a. Tattersall Farm parcel.
Aerial photograph from 2008; boundary approximate.



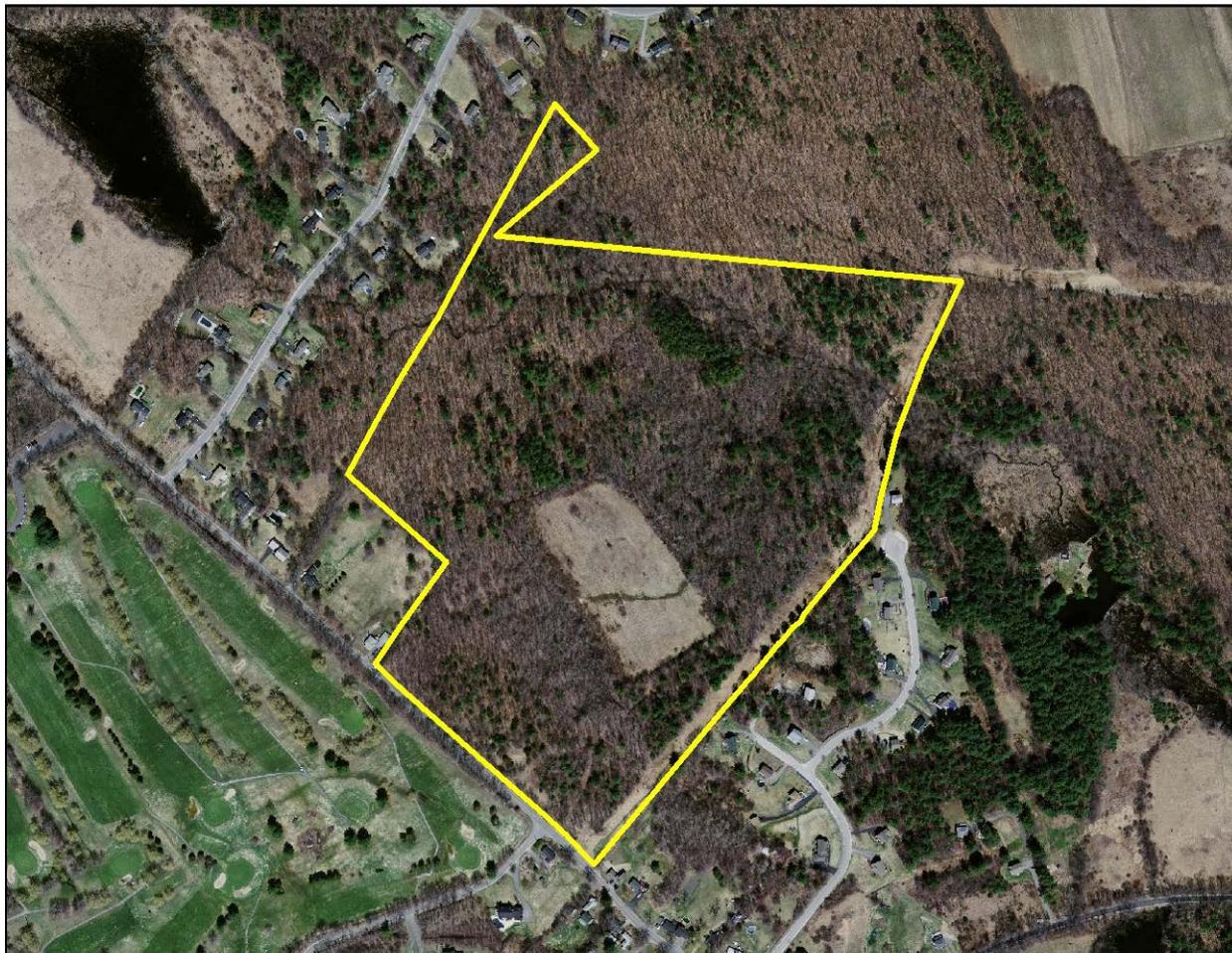


Figure 1b. John's Woods parcel.

Aerial photograph from 2008; boundary approximate.



Tattersall Farm and John's Woods were bequeathed to the City of Haverhill by the will of Mary Tattersall in 1999, for the purposes, according to the Trust documents:

of preserving the land and farmhouse and the other building, foundations, and structures appurtenant thereto at the Tattersall Farm, and the vacant land at the Chase Place in as close to its present state of condition as possible, preventing construction or development of the land so that its predominant open and natural condition remains intact; protecting environmental ecosystems on the premises and related wildlife and conservation interests; preserving woodland, agricultural horticultural, and animal husbandry practices in accordance with prudent forestry and agricultural management practices; restricting the type of activities to be conducted on the premises for the purposes of conservation and preservation; and improving the general welfare of the residents of the city of Haverhill through informing and educating them on matters relating to environmental conservation, and such other subjects relating to history of framing in the Haverhill Area, and in the United States in general.

The property is managed by a Board of Trustees which currently includes community volunteers and the heads of the City's Conservation Department and Recreation Department. Fields on the farm are currently hayed under a lease agreement which expires in 2013. The farm house has been occupied by a property caretaker. The current caretaker is leaving the property in 2013 and the Trustees will be looking for a new caretaker.

This section of the report focuses on the Tattersall Farm lot, south of North Broadway. In 2013, the City received funding from the Massachusetts Department of Conservation Services PARC program to design a community garden and nature play space on this lot, and to improve access to the property and interpretation of the landscape.

Tattersall Farm can be divided into four major areas:

- Farm house and parking area – 3.4 acres associated with the farm house and driveway, public parking area, and lawns.
- Fields – 41.5 acres of fields currently managed for hay and occasionally rotated into corn. The fields are managed under a lease which is currently held by Tyler Kimball of Kimball Farm of Haverhill.
- Forest – 36 acres of forest ranging from mature white pine-mixed hardwood stands to younger stands dominated by red maple and white ash.
- Wet Forest & Marsh – 1.6 acres of marsh dominated by cattail and speckled alder along with 2 acres of young, red maple-dominated forest on moist soils.

This diverse landscape provides potential habitat for a wide range of species and existing trails provide access for passive recreational users to experience these various habitat types.

Existing Conditions

Site Setting and Context

Tattersall Farm and Johns' Woods are located in northwest Haverhill, in an area of relative low-density development. As seen in Figure 2, the two parcels lie outside of the most densely developed sections of Haverhill and are adjacent to other blocks of undeveloped land. To the east of Tattersall Farm are roughly 85 acres of forest, field, and shrubland, while north of North Broadway lie an additional 80 forested acres. A narrow strip at the southwest corner connects to another 60 acres of forest and wetland. John's Woods is part of an 800-acre block of forest, field, and wetland stretching northwest into New Hampshire and interrupted only by the houses of Parsonage Hill Road. Sitting as they do within blocks of undeveloped land, these parcels act as important corridors for wildlife among these various parcels.

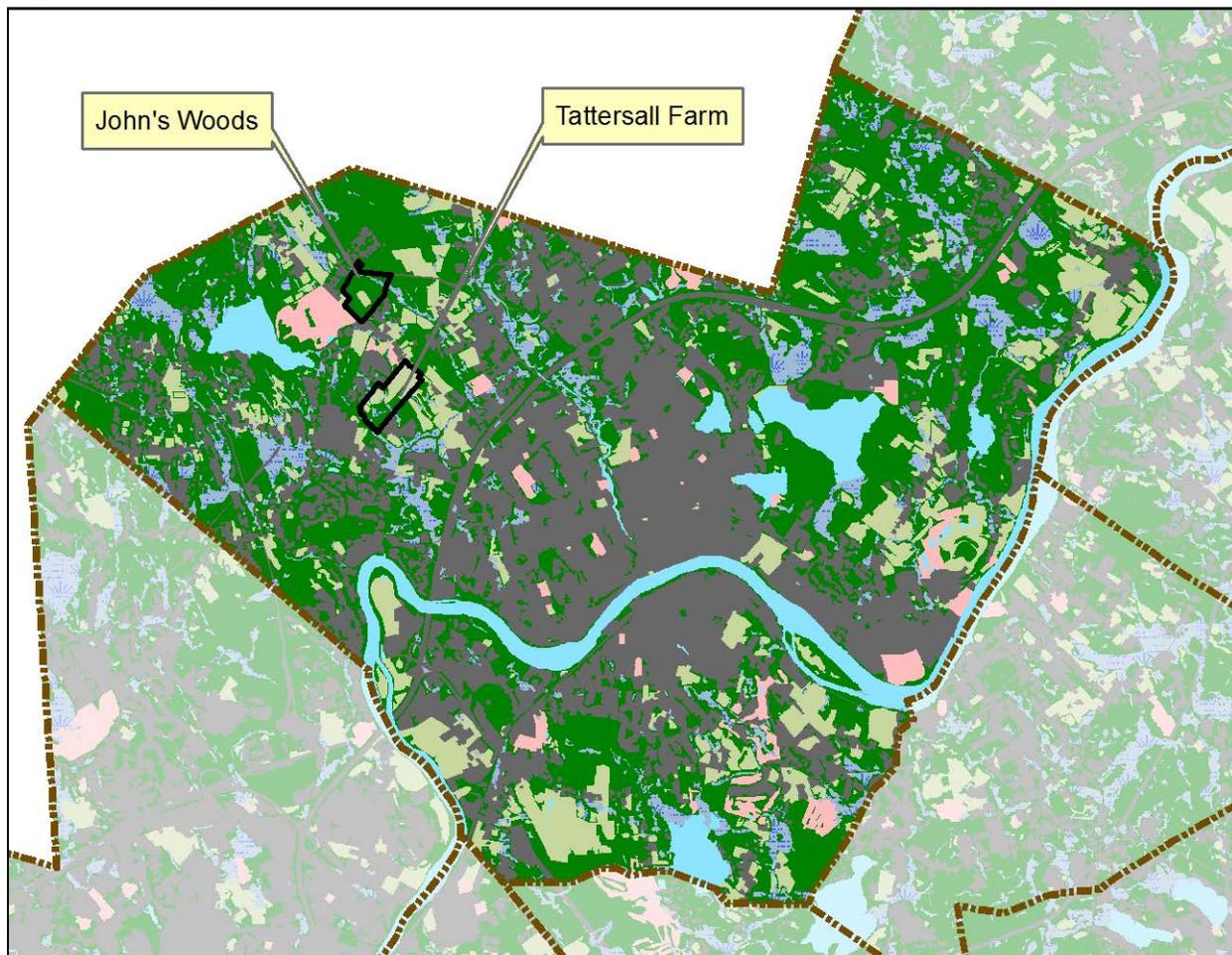
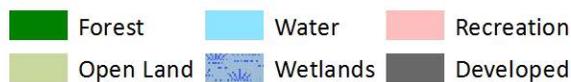


Figure 2. Land Use in vicinity of Tattersall Farm & John's Woods

General Land Use (2005)



Topography

As seen in Figures 3a and 3b, the Tattersall Farm parcel has a southern aspect with the land sloping gently downhill from a highpoint at the parking lot to Creek Brook which defines the southern boundary and a low point at the southernmost corner. There are very few steep slopes on the property, making it very suitable for agriculture and for trails. With such a consistent and gentle profile, the most notable topographic feature is the wide, shallow valley visible from the parking lot and from North Broadway as a visitor looks south over the property and to the next low ridge defined by Broadway. Boulders found at the surface on a steeper than average slope in the southeast corner of Tattersall Farm add an attractive element to the landscape and appear to be enriching the soil as they weather. The topography makes for fairly easy trail routing throughout the entire property.

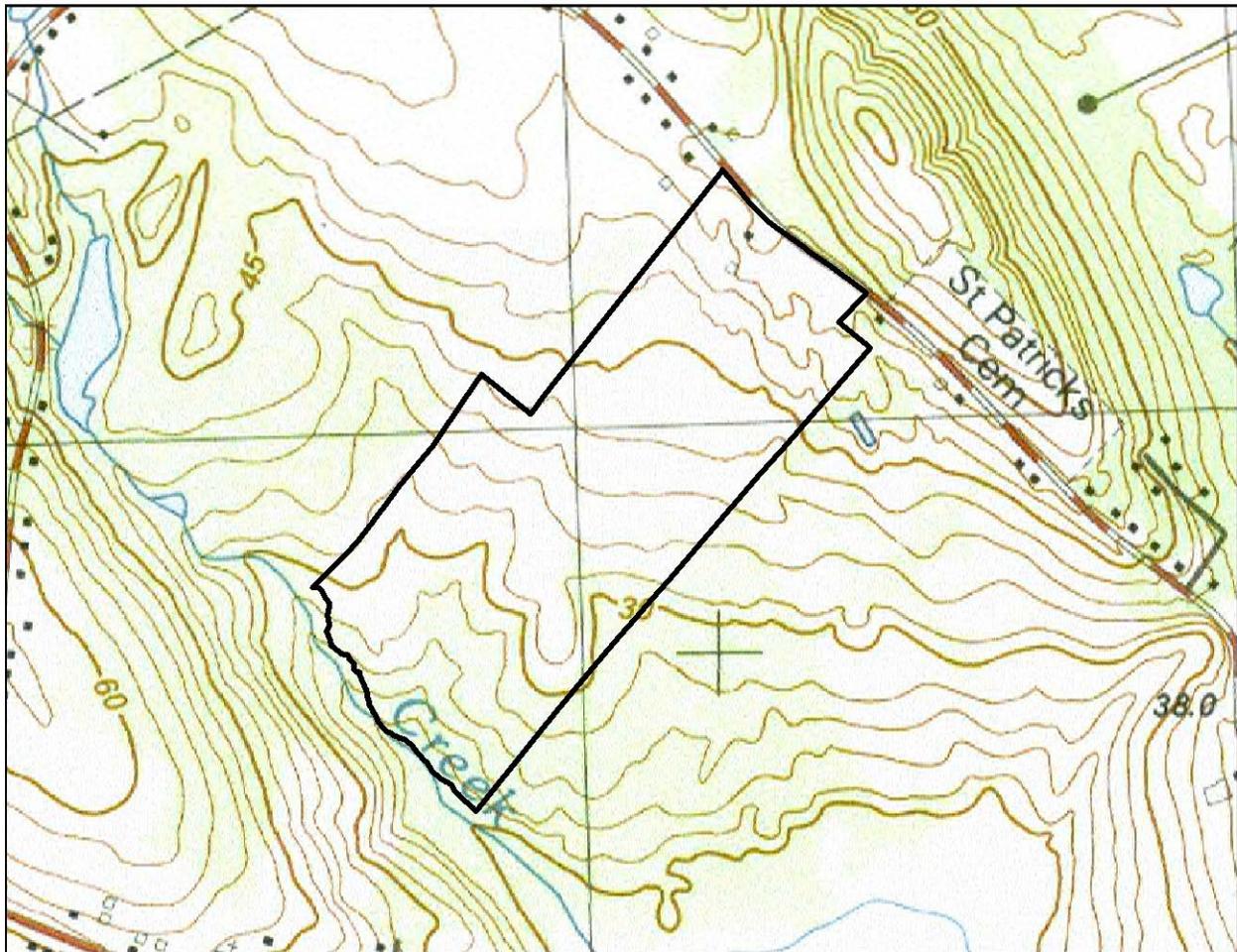


Figure 3a. Topography of Tattersall Farm



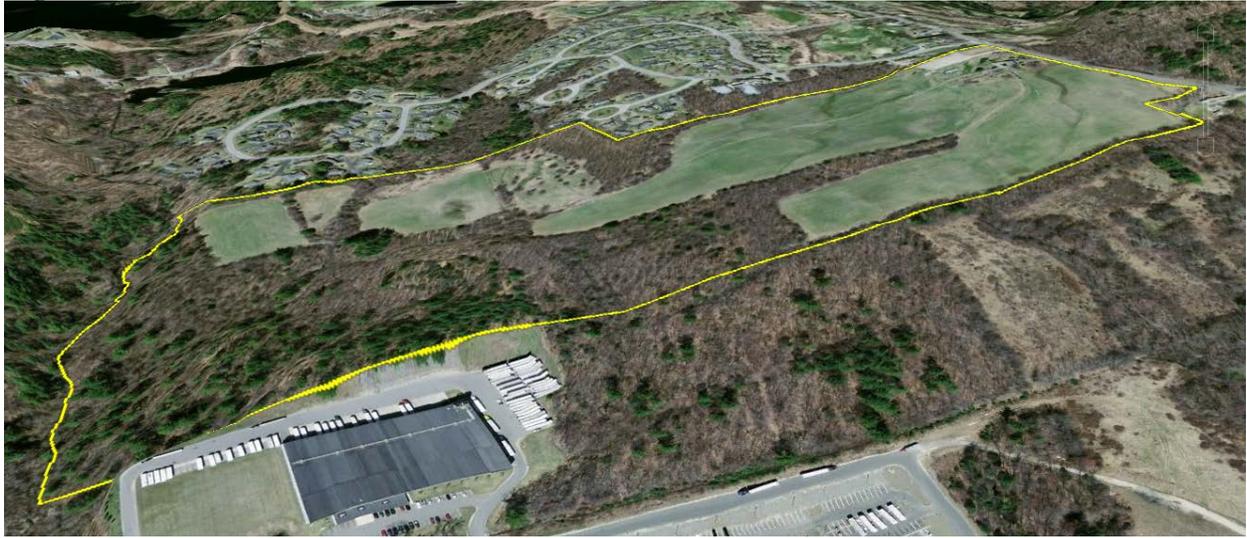


Figure 3b. View of Tattersall Farm in Google Earth. View is looking north-northwest, relief is exaggerated x3.

Soils

Soils on the Tattersall Farm parcel are entirely fine sandy loams derived from glacial till, the material left behind by melting glaciers roughly 15,000 years ago (Figure 4). In soil classification, “loam” refers to a soil with a mix of sand, silt, and clay particles. The “fine sandy” prefix indicates that these loams are a bit weighted to sand and that the sand particles are small. The fine sandy loams at Tattersall Farm range from low in stones to extremely stony, with the more stony soils to be found in the forested areas and generally lower on the slopes. Less stony soils are much preferred for farm fields, and the existing fields match the map of stone-free soil types.

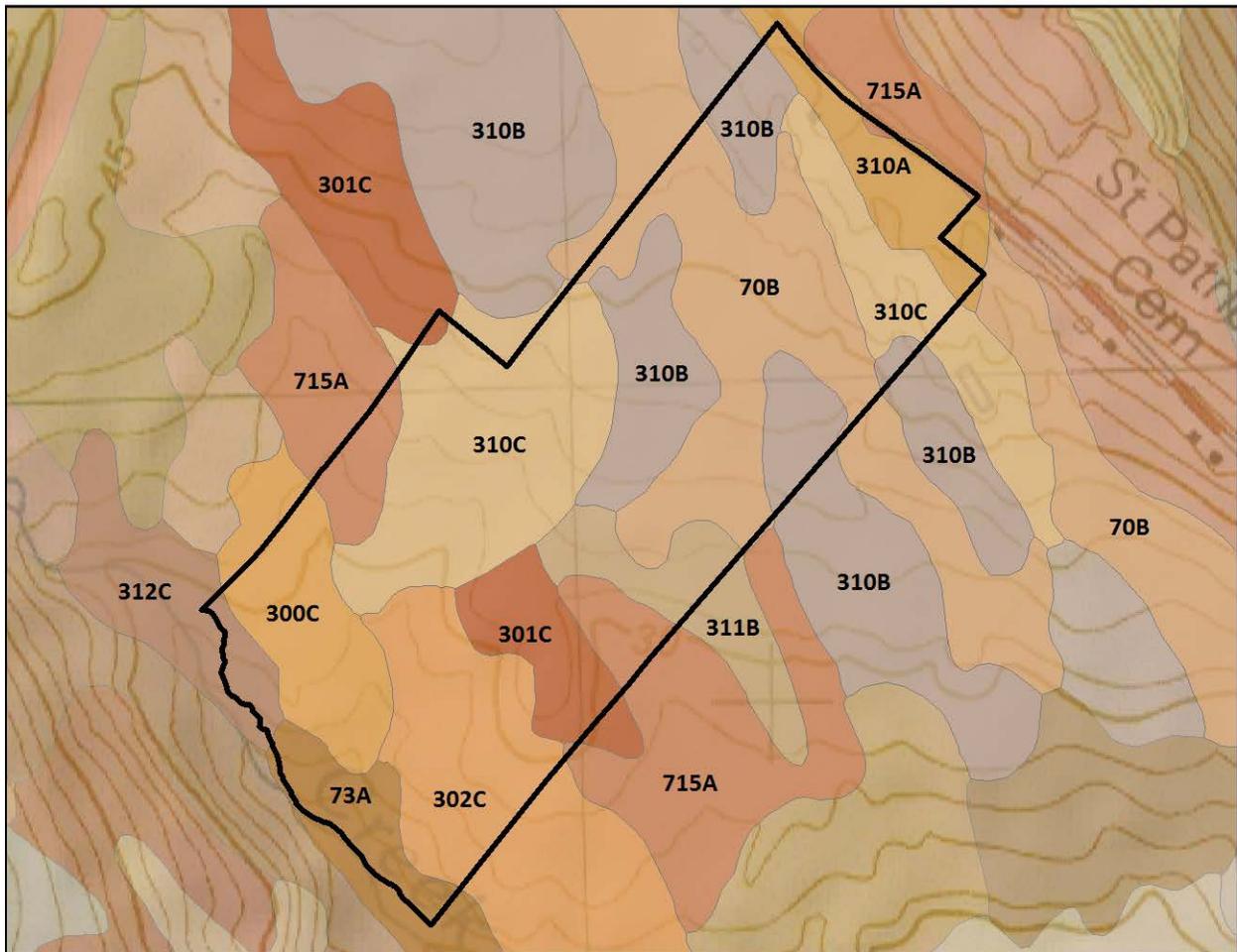


Figure 4a. Soils at Tattersall Farm



-  70B - RIDGEBURY FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
-  73A - WHITMAN FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES, EXTREMELY STONY
-  300C - MONTAUK FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
-  301C - MONTAUK FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, VERY STONY
-  302C - MONTAUK FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, EXTREMELY STONY
-  310A - WOODBRIDGE FINE SANDY LOAM, 0 TO 3 PERCENT SLOPES
-  310B - WOODBRIDGE FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
-  310C - WOODBRIDGE FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES
-  311B - WOODBRIDGE FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES, VERY STONY
-  312C - WOODBRIDGE FINE SANDY LOAM, 8 TO 15 PERCENT SLOPES, EXTREMELY STONY
-  715A - RIDGEBURY AND LEICESTER FINE SANDY LOAMS, 0 TO 3 PERCENT SLOPES, EXTREMELY STONY

Fine sandy loams are generally moderately permeable to water movement, however drainage may be restricted by the presence of a dense, low permeability layer or hardpan inches to feet beneath the surface. At Tattersall Farm, the Ridgebury fine sandy loam cutting across the farm fields holds water and creates some moist patches in the hay fields. This can be seen in Figure 7, an aerial photograph from April, 2001, where the darker sections of the fields indicate standing water or very wet soil.

Fine sandy loams are slightly acidic and moderate in nutrient availability. The Montauk and Woodbridge units are identified as important agricultural soils by the USDA and Massachusetts Department of Agricultural Resources. The stone-free units are categorized as Prime Agricultural Soils, or “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses.” The very stony sections are categorized as Farmland of Statewide Importance, or “land, [other than Prime Agricultural Soils], that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops, as determined by the appropriate state agency or agencies. Generally, these include lands that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods.”

The very stony sections include many boulders at or near the surface. Where our New England soils in general, and sandy soils in particular, tend to be acidic due to chemistry of the parent material and naturally acidic rain water, compounds weathering from these boulders will tend to buffer that acidity and maintain a higher nutrient availability in the soils. This creates conditions favorable for less common forest communities made up of species that require these conditions, such as the shagbark hickory stand found on the extremely stone Montauk fine sandy loam in the southeast corner of the Tattersall Farm lot.



Figure 6. Aerial photograph from April, 2001 illustrating slow drainage of Ridgebury soils in farm fields at Tattersall Farm. Photo from MassGIS.

Hydrology

Hydrology of the sites reflects the overall sloping nature of each lot, with water on the Tattersall Farm parcel draining south to Creek Brook. Water drains south across Tattersall Farm in five lines, described from east to west as shown in Figure 7:

A very shallow linear depression in the Woodbridge soil unit at north end of the more easterly field that collects water from the northeast corner of the property and drains south and across the property line to a swamp on the adjacent parcel to the east. Standing water may be found during wet conditions.

Another shallow depression, in the Ridgebury soil unit, through the middle of the more westerly field, which collects water from the upper section of this field and directs it south, under the farm road by way of a plastic culvert, and into the woods south of the large fields, eventually entering a swampy area and flowing onto land to the east. Standing water appears to be common in wet conditions.

A more noticeable stream channel carries water from the north into the wooded area south of the large fields entering a shallow marshy/shrub swamp area where the farm road crosses from Field 2 to Field 3, then flowing through a swampy area as a well-defined stream channel before meeting Creek Brook near the very southern corner of the property. The upper part of this channel likely has limited flow during dry periods.

Water from the north collects in a shallow marsh and then flows seasonally in a shallow channel, through a culvert under a farm road, before meeting the flow from 'c' in a swampy area and flowing to Creek Brook. While the marsh likely holds water throughout the year, the channel draining south may lack flow in dry conditions.

Water from the very southern portion of the property drains south directly to Creek Brook which defines the southern boundary of the property. Creek Brook flows southeast, leaving the property at its very southern point and flowing another mile south to the Merrimack River near the intersection of River Street and Western Avenue in Haverhill. Creek Brook appears to be a perennial stream.



Figure 7a. Tattersall Farm parcel.



Aerial photograph from 2008; wetlands from MassDEP; boundary approximate.

The existing farm roads and trails, which would be the basis for any future trail system, have been constructed to avoid or pass over stream channels and areas where water is likely to pool.

Natural Communities

Natural communities are assemblages of plants that tend to occur together based on landscape conditions such as soil type, soil moisture, slope, aspect, and elevation as well as historical factors such as disturbance. Where the same conditions occur within an ecoregion, the same or similar natural communities will tend to occur. The natural communities of Tattersall Farm and John’s Woods reflect both the underlying landscape and the land use history of each site. Environmental factors influencing

the distribution of natural communities on the property are primarily related to soil moisture and soil nutrient content. While the most obvious land use influence is the historic and continued disturbance of the fields by farming and mowing, the forested areas of the property also reflect periodic clearing of the land, logging operations, and the former presence of apple orchards.

The natural communities of Tattersall Farm are depicted in Figure 8 and are described below. Since the descriptions of dominant species are based on visits in early spring 2013, before the emergence of all identifying characteristics, many plants are identified to genus only.



Figure 8. Natural Communities of Tattersall Farm



Fields

Fields range from less than half an acre to 17 acres in size and include well-drained sections dominated by introduced cool-season hayfield grasses, poorly drained sections with species better adapted to moist soils, and a section being taken over by woody species including invasive shrubs. Most field edges are

characterized by invasive shrubs such as multiflora rose and honeysuckle and are slowly encroaching on the various fields.

- Field 1 – A <0.4 acre field at the northernmost portion of the field, bounded by North Broadway, the public driveway and the parking area. This field is mown for hay with the other fields.
- Field 2 – 13 acres now used for hay. This field was rotated into corn recently and then reseeded with a hay mix dominated by orchard grass. Grasses dominate the field, however they have not yet established at the ultimate density of a hayfield, so other meadow species, including a widespread mustard, have gotten a toehold in the field. As seen in Figure 7, the upper part of the field and the middle part hold moisture during the spring. These wet sections have some grasses that favor moist soil conditions, possibly reed canarygrass.
- Field 3 – 17 acre field used for hay in recent years. Field was reseeded in past 10 years and is currently dominated by orchard grass with alfalfa and other clovers. Vegetation is fairly homogenous and is dominated by typical hayfield species as orchard grass, clovers, plantains dandelion, and a bedstraw. The wetter portions of the field include additional grass species which were not identifiable to species at the time of my visits but probably includes reed canarygrass. While most of these species are non-native, this type of hayfield provides excellent habitat for some grassland nesting birds including bobolink and savannah sparrow. This field would also offer excellent habitat for a wide range of invertebrates including butterflies and dragonflies as well as small mammals such as voles and mice. The voles and mice attract flyovers by raptors such as red-tailed hawks and also may attract owls from the nearby forest. A farm road running down the middle and includes a raised section with culvert to cross the wettest part of this field.
- Field 4 – A 3.25 acre meadow with several trees and large shrub ‘islands’. This meadow is mown annually when the other fields are hayed, but it does not provide high quality hay. Roughly 10 medium sized red maple or white ash trees are scattered through the field as well as 7-10 large common buckthorn trees and 4-5 apples. Each of these shelters a dense understory of invasive shrubs which have escaped the mower’s blade for several years. The very eastern side of this meadow borders the intermittent stream that drains the wet forest to the north. This area of moist soil includes cattail, sensitive fern, blue vervain, skunk cabbage, reed canarygrass, a goldenrod, and marsh rose.
- Field 5 – A 3.1 acre hayfield divided from Field 4 by a broken line of trees. This vegetation in this field is similar to Field 3, a fairly well-drained patch of orchard grass-dominated hay mix.
- Field 6 – A 1.2 acre meadow which is mown but is not a high quality hayfield. Vegetation here is influenced by the wetland to the north and is likely dominated by reed canarygrass.
- Field 7 – A 2.3 acre field of orchard grass-dominated hay mix, mown for hay. Similar to Fields 3 and 5.

Forests

Forest covers 38 acres of Tattersall Farm and ranges from young, even-aged red maple forest on moist soils to mature, uneven-aged, mixed hardwood-white pine forest on dry, rocky soils.

- Forest 1 – This 3.8-acre patch of young forest is characterized by a 30-40 foot canopy of red maples and white with black cherry, pin cherry, apple trees, and tall common buckthorns in the understory. Invasive multiflora rose and honeysuckle shrubs are present at high density, extending into this forested patch from the adjacent field edges. Other shrubs include wild raisin and gray dogwood along with saplings of red maple and white ash and poison ivy low to the ground or climbing tree trunks. Oriental bittersweet is present at low density, reaching into the canopy in places. An intermittent stream runs along the eastern side of this forest patch, with sensitive fern, jack-in-the-pulpit, and moneywort common in the ground layer when moist soil abuts this stream.
- Forest 2 – A 33-acre forested area ranging from red-maple dominated on moist soil to mixed hardwood-white pine on rocky soils. Areas where the wet drainages run through the forest, as seen in Figure 7, are dominated by red maple with an understory of native wetland shrubs and many invasive shrubs including glossy buckthorn and honeysuckle. The convex slopes, where water is shed rather than collected, tend to be dry and dominated by white pine with black oak, black birch, and white oak.

A patch in the southeast corner of the property includes a higher component of shagbark hickory which suggests more nutrient-rich soils. This area also had a pleasant carpet of white anemone during a May visit. Other species here include white ash, yellow birch, white pine, sugar maple, honeysuckle, lowbush blueberry, Canada mayflower, Pennsylvania sedge, pin cherry, arrowwood, gooseberry, multiflora rose, Japanese barberry, gray dogwood, and winged euonymus.

The wetter soils adjacent to Creek Brook and the lower section of drainages 'c' and 'd' in Figure 7 includes marsh fern, false hellebore, witch hazel, and skunk cabbage.

A patch near Field 5 is relatively young, with bigtooth aspen common in places. The very northern end of the long strip extending between Fields 2 and 3 is quite scrubby and is dominated by non-native shrubs including multiflora rose, honeysuckles, and autumn olive.

Wetlands

A small shallow marsh (1.6 acres) is found on the west side of Field 4. The more open areas of the marsh are dominated by cattail with speckled alder filling in on the edges and red maple saplings on higher ground around the marsh. Other species include glossy buckthorn, gray dogwood, and multiflora rose; sedges and reed canarygrass; and white pine on the edges.

Wildlife

As the timeline for this report was compressed, we did not have the opportunity to view the property over multiple visits and through more than one season. The following information is based on our

assessment of wildlife habitats on the property and inferences of which species may make use of those habitats.

The Massachusetts Natural Heritage & Endangered Species Program (NHESP) produces maps of Priority Habitat for Rare Wildlife and Estimated Habitat for Rare Wildlife. NHESP also recently produced BioMap2, a report that identifies lands most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems. Neither Tattersall Farm nor John’s Woods is identified in any of these NHESP products. This doesn’t imply that the properties are not good wildlife habitat, but only indicates that no species listed for protection in Massachusetts or rare or unique natural communities have been identified on the property. In fact, the combination of fields, forest, and edge create an ideal landscape for many of our habitat generalists such as coyote and white-tailed deer, and offer specialized habitat for some of our less common species that require large tracts of specific habitat such as mature forest or grassland.

Mammals	Status	Notes
Virginia opossum	Likely	
Eastern Gray Squirrel	Likely	Near farm house and along forest edges
Red Squirrel	Likely	Especially where white pine is more dense
Southern flying squirrel		
Woodchuck	Likely	Near farmhouse and field edges. Likely to become a pest with new community garden.
Eastern chipmunk	Likely	On forest edges and stone walls
Meadow jumping mouse	Likely	In shorter grass and fields
Meadow vole	Observed tunnels	Likely extensive in fields
White-footed deermouse	Likely	Near house and in fields
Eastern cottontail	Likely	In shrubby field edges, likely to become a pest with community garden.
Northern short-tailed shrew	Likely	In meadows, stone walls, and house foundation
Star-nosed mole	Likely	In open forest areas and edges
Hairy-tailed mole	Likely	In forest edge
Little brown myotis	Likely	Hunting over fields, may roost in house attic or outbuildings
Coyote	Observed scat	Scat observed in open fields; likely uses the entire property.
Red fox	Likely	Dens observed could be fox dens; likely use the fields
North American river otter	Possible	May occasionally visit Creek Brook
Fisher	Likely	Would use forests and edges for hunting, possibly use the few large trees for denning.
Ermine	Possible	

Long-tailed weasel	Possible	
Striped skunk	Likely	At least occasional visitor, may become more common with garden and compost piles.
White-tailed Deer	Observed tracks	Most likely utilize entire property

We will provide additional detail on use of the property by birds following a visit during the breeding season in late May.

Wildlife and Farming Activities

Current farming activities focus on mowing all of the fields for hay production. Farmer Tyler Kimball reports that typical practice for many years has involved an annual mow in late June and a second mow later in the season. Actual mowing dates vary based on annual weather conditions, primarily the amount of spring rain, which drives development of the grasses. The actual haying operation then requires several rain-free days in a row for optimal harvesting. Delaying mowing too long in the season lets the grasses mature so that protein content of the inflorescence decreases, reducing the value of the hay for protein-intensive feeds such as for dairy cows.

Hayfields provide breeding habitat for a number of grassland birds and provide primary or supporting habitat for a wide range of mammals and invertebrates. A defining characteristic of grasslands is periodic disturbance, that is any process that suppresses the growth of woody species. Without periodic disturbance, be it mowing, grazing, fire, or chemical control of woody plants, woody species will eventually grow throughout a grassland, overtop and shade out the grasses, and succeed through a shrubland stage to a forested condition. Grassland habitat is becoming less common in Massachusetts and many of the species that rely on grassland for at least one stage of life are at risk due to this loss. At Tattersall Farm, mowing is the disturbance that maintains the fields in their open condition. If mowing was discontinued in the fields, they would eventually succeed to shrubland and forest.

The grasslands would be enhanced from a habitat and from a hay production perspective by reclaiming the edges of the fields from shrub encroachment. Invasive shrubs have become well-established on most of the field edges and have slowly, year after year, encroached on the field edges so that stone walls and tree lines that formerly marked the field edge are now 30 to 40 feet from the current field edge. A conservative estimate is that these shrubby edges represent over 3 acres of additional grassland habitat that could be reclaimed by removing these shrubs and re-establishing hayfield along the field edges. Areas where the fields should be cleared back are shown in Figure 9.

Habitat Management Recommendations

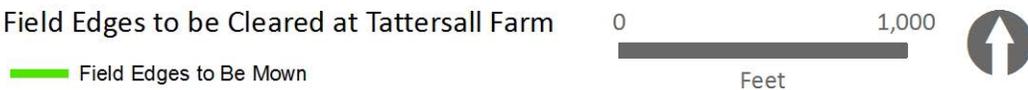
While disturbance is essential to maintaining an “early successional habitat” such as grassland, the disturbance itself can impact wildlife species making use of the habitat. In the case of mowing for hay,

the best time of year for mowing often overlaps with the breeding period of our grassland-nesting birds such as bobolinks and savannah sparrows. For this reason, Mass Audubon recommends delaying mowing until July 4th at the earliest, with July 15th being an even better date for the first mow. An alternative approach is to designate specific fields as *refugia* each year. An annual bird survey in early June could identify which parts of the fields are being used for nesting by grassland birds. These areas could be designated for a later cut.

Bobolinks and savannah sparrows follow roughly the same pattern of reproduction: pairing and nest-building in late May or early June followed by egg laying and incubation. After 12-14 days, eggs hatch and the parents bring food to the nestlings. After another 10-14 days, the chicks leave the nest and disperse into the surrounding grassland. For the next two weeks the flightless chicks are fed by the parents as their flight feathers develop and they learn to forage for themselves. The chicks are at greatest danger of mortality from mowing during this period. Bobolinks have a fairly discrete pattern of nesting, hatching, and leaving the nest, although adults who lose a nest to predation will re-nest and poor weather in a given year can push back nesting over a wider area. Bobolinks will occasionally



Figure 9. Field Edges to be Cleared at Tattersall Farm



attempt a second nest. Savannah sparrows are later initiators of nests and later in leaving the nest than bobolinks, although one study from Nova Scotia reports peak fledging dates in late June. They will regularly initiate a second nest after success with the first nest. Typical dates for their nesting, hatching, and fledging are given in Table 1.

Table 1. Average time of reproductive activity for bobolink and savannah sparrow. Periods of high activity marked with "X", lead up and trailing periods marked with "-". Activities continue on later into the summer.

	Month (week)	May (3)	May (4)	June (1)	June (2)	June (3)	June (4)	July (1)	July (2)	July (3)
Bobolink	Eggs	-	X	X	X	X	-			
	Nestlings			-	X	X	X	-		
	Flightless					X	X	X	X	X
Savannah	Eggs		-	-	X	X	X	X	X	X

Sparrow	Nestlings				-	X	X	X	X	X
	Flightless					-	X	X	X	X

While haying earlier than July 4th can have an impact on some grassland bird nests and fledglings, the hayfield can continue to provide viable breeding habitat for some birds. A field used for row crops or a community garden, on the other hand, will generally not provide breeding habitat for birds. Killdeer may find a place to nest in exposed soil on the edge of a more intensively farmed area, and birds may use such farmed areas for feeding, but the less-natural structure of these areas will be unattractive for nesting.

Most of the field edges have been colonized by invasive shrubs such as multiflora rose, honeysuckles, and autumn olive. These shrubs grow as much as 40 feet into the former field area and have reduced the usable area of hayfield. Left to their own, they will continue to encroach on the fields. These sunny field edges are ideal habitat for invasive shrubs, and the shrubs here act as a seed source for further spread of invasives into the adjacent forest. The shrubs should be aggressively managed to halt their spread into the fields and to reclaim field area by clearing the shrubs back to the stone walls where possible.

Field 4 is not a high quality hayfield but rather is a more diverse meadow with some trees and patches of invasive shrubs breaking up the grassy area. While this type of open area provides a different type of habitat than either the adjacent grasslands or forest, the level of invasives in the field make it less than optimal. The unit could be improved by removing the invasive shrub ‘islands’ that are found throughout the field and removing invasives from the bases of native trees. Some of the larger trees standing in the midst of the field could be removed as well, to prevent the current situation where invasives colonize these islands due to the inability of controlling them with periodic mowing. The medium-sized apple trees at the northern edge of this field should be retained.

The narrow strip of forest running between Fields 2 and 3 is largely young forest, with the very northern end dominated by invasive shrubs. This strip interrupts the expanse of grassland habitat created by Fields 2 and 3, habitat that would be enhanced by removing this narrow strip of forest so that the two separate fields are joined into one large field. At the very least, the northern-most section of this strip should be removed to control invasives and expand the area of grassland.

Invasive shrubs will re-sprout if they are simply cut down, and some of the shrub species will respond to cutting by expanding their root system, becoming even more difficult to control. An invasive species control specialist¹ should be engaged to develop a comprehensive, multi-year invasives management plan with estimated budget. Typical treatment in a setting such as Tattersall Farm would include mechanical removal of shrubs with heavy mowing equipment followed by herbicide treatment of the re-sprouts and follow-up treatments to suppress reinvasion. Ideally, expansion of the fields would be

¹ Such as Polatin Ecological Services at www.polatineco.com.

coordinated with the farmer so that hayfield grasses are planted in these expanded areas before invasives can become reestablished.

Trail Enhancements

The existing network of farm roads and forest trails provides an excellent starting point for an attractive and coherent trail network to explore the variety of habitat types at Tattersall Farm. The trail network allows a visitor to explore the fields, forest, and streams on a loop of farm roads and footpaths. The trails could benefit from enhanced definition in the farm fields, some widening and regular maintenance in the woods, and the installation of boardwalks and/or bog bridging on wet soils in the forest. The following comments are keyed to Figure 10.

1. The farm road from the parking lot runs through the middle of Field 3. In general, it is preferable to limit habitat fragmentation by locating trails on the side of fields, but this trail is so well established and useful, especially where it passes over the wetter section of the field, that it is advisable to keep it where it is. Keeping the present location is further supported by the fact that dogs are not allowed on Tattersall Farm and so will not cause disturbance to ground-nesting birds in the grasslands.
2. The paths through Fields 4, 5, and 7 run across grass essentially identical to that in the middle of the field and appear to have been maintained historically with periodic mowing. It is very difficult to follow these trail sections in spring or after field mowing as there is very little to differentiate the trail from the short grass of the field itself. Trail should be further defined by removing some vegetation to reveal a natural dirt surface or installing another surface such as a stone aggregate. Alternatively, the trail sections in Fields 5 and 7 could be re-aligned to the east so that they skirt the field in areas that are currently densely vegetated with invasive shrubs. This would need to be preceded by intensive management of the invasive species between the current field edge and the old field edge marked by a stone wall.
3. Trails in the woods appear to be little used. They are mostly narrow, leaf-strewn and have shrubs and branches reaching into the trail. They would be improved by raking the trail surface, pruning back shrubs and limbs alongside the trail, and removing fallen sticks throughout the trail system and widening the tread in some places.
4. Trail signs currently indicate a loop at the southwest of the property, along the southern edge of Field 7, then southeast along Creek Brook to an intersection with another forest trail. Creek Brook is very attractive in this area, but this trail is quite overgrown and difficult to follow. The ground is wet where the trail runs alongside the stream making it difficult to navigate in wet seasons and difficult to maintain a trail. In addition, where the trail enters the forest from the western side of Field 7, it drops down a relatively steep slope. The trail has been enhanced with concrete pavers to create a set of steps, but soil erosion on the slope has filled in some between the pavers, and the trail is difficult to navigate. The trail does not bring the visitor to any new

habitat types that aren't seen on other trails. I would recommend that this section be closed and the sign posts removed from the southwest corner of Trail 7.

5. The trail along Creek Brook is quite wet and would be enhanced by the installation of a boardwalk or bog bridge.
6. The crossing from Field 5 to Field 7 is a wide causeway crossing the wet drainage in this area with culverts allowing drainage from north to south. This farm road allows for equipment and pedestrian access between these two fields but is currently surfaced with very coarse, angular stones which could be difficult footing for some and would be damaging to cross-country skis in thin snow cover. This surface should be amended with finer stone material.
7. The trail extending south from the forested strip between Fields 2 and 3 includes planks in several locations to cross lengths of wet soil. These planks should be upgraded to boardwalk or bog bridging.



Figure 10. Comments on Trails at Tattersall Farm



We did not note any evidence of unwanted use of the property by ATVs, motorcycles, or dogs. There are no trail connections to adjacent properties, so uncontrolled access is limited. A turkey hunter was observed in the woods of the property adjacent to Field 2. He may have been targeting birds in the Tattersall Farm fields, or he may have been focused only on the scrubby forest to the east.

Conclusion

Tattersall Farm is a lovely, large piece of conservation land that is valuable for its agricultural, recreational, and habitat values. It is part of a network of open space in northwestern Haverhill and provides a large patch of grassland habitat, which is becoming less common in Massachusetts. Our main recommendations are:

- 1) Expand the fields by removing shrubby growth along the edges
- 2) Clear the patch of young shrubby cover at the northern end of the strip between Fields 2 and 3.
- 3) Manage haying practices to minimize damage to nesting birds while maintaining profitability and ensuring long-term maintenance of the grassland.
- 4) Design intensive agricultural activities as close to existing parking area and farmhouse so that impacts on remaining grasslands are minimized.
- 5) Plan and carry out invasive species control on field edges and in Field 4 so that it can be restored to meadow or shrubland habitat.
- 6) Surface trails where they pass through fields so that they are discernable when the field grasses are not high.
- 7) Widen forest trails where necessary so they are not obscured by vegetation in summer.
- 8) Improve surface of crossing between Field 5 and Field 7 so footing is better.
- 9) Install bog bridging in wet trail sections in forest.

Through this thoughtful, comprehensive planning and design process, the community gardens, fields, and trails of Tattersall Farm will become a treasured destination for years to come.

Appendix – SOILS USDA General Descriptions of Soil Types

70A - Ridgebury fine sandy loam

The map unit is poorly drained; water is removed so slowly that the soil is saturated or remains wet for long periods. Agronomic capability class is 3W indicating moderate to severe limitations on agricultural use due to wetness. Depth to bedrock is greater than 60 inches. A firm layer at about 18 inches impedes the vertical movement of water. A seasonal high water table is normally between 0 and 0.5 feet below the surface from November through May.

300B - Montauk fine sandy loam

The map unit is well drained; water is removed readily, but not rapidly. Agronomic capability class is 2E indicating some limitations on agricultural use due to erodibility. Depth to bedrock is greater than 60 inches. A firm layer at about 2 inches impedes the vertical movement of water. A seasonal high water table is normally between 2.0 and 2.5 feet below the surface from February through May.

310A - Woodbridge fine sandy loam, 0 to 3 percent slopes

The map unit is moderately well drained; water is removed somewhat slowly during some periods. Agronomic capability class is 2W indicating some limitations on agricultural use due to wetness. Depth to bedrock is greater than 60 inches. A firm layer at about 26 inches impedes the vertical movement of water. A seasonal high water table is normally between 1.5 and 2.5 feet below the surface from November through May.

715A - Ridgebury and Leicester fine sandy loams, 0 to 3 percent slopes, extremely stony

The RIDGEBURY component is poorly drained; water is removed so slowly that the soil is saturated or remains wet for long periods. Surface stones limit cultivation or use of equipment. Agronomic capability class is 7S. Depth to bedrock is greater than 60 inches. A firm layer at about 18 inches impedes the vertical movement of water. A seasonal high water table is normally between 0 and 0.5 feet below the surface from

The LEICESTER component is poorly drained; water is removed so slowly that the soil is saturated or remains wet for long periods. Surface stones limit cultivation or use of equipment. Agronomic capability class is 7S. Depth to bedrock is greater than 60 inches. A seasonal high water table is normally between 0 and 1.5 feet below the surface from NOV thro

6A - Scarborough mucky fine sandy loam, 0 to 1 percent slopes

The map unit is very poorly drained; water is removed from the soil so slowly that free water remains near the surface. Agronomic capability class is 5W. Depth to bedrock is greater than 60 inches.

73A - Whitman loam, 0 to 3 percent slopes, extremely stony



The map unit is very poorly drained; water is removed from the soil so slowly that free water remains near the surface. Surface stones limit cultivation or use of equipment. Agronomic capability class is 7S. Depth to bedrock is greater than 60 inches. A firm layer at about 20 inches impedes the vertical movement of water.