EAST LEVERETT MEADOW
EDGE MANAGEMENT PLAN

Submitted to Rattlesnake Gutter Trust

By

Conservation Works
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August 24, 2015

EAST LEVERETT MEADOW PRELIMINARY REPORT
TO RATTLESNAKE GUTTER TRUST
SUBMITTED BY CONSERVATION WORKS
August 25, 2015

Please refer to the following documents in addition to the narrative below:

- **Property map** showing edge habitat divided into 12 management sections.
- **A list of plant species** ranked by cover percent for each section.
- **Photographs** of points of interest in each section.
- **Edge habitat management by section.**
- **A summary chart of management recommendations by section.**

NARRATIVE

The East Leverett Meadow (ELM) edge, the area between the main field and the adjacent woods, is unusually wide and diverse and deserves special management attention. We recommend management intervention that favors desirable species and keeps undesirable species under a degree of control without huge expense on the part of Rattlesnake Gutter Trust (RGT). Because public passive recreation is not a significant part of RGT's goals for the property, ELM management can focus on habitat maintenance and improvement. A modest trail from the roadside parking area through the woods to the open meadow allows visitors to enter the property. An additional mowed path around the perimeter of the field also allows access to the complete edge area.

Ridding sites or micro-sites of invasive plants mechanically, without herbicides, requires a high level of effort and persistence. We recommend that RGT put a reasonable level of resources into that effort and into continuing efforts to influence plant composition in the ELM edge. One method to consider is the use of goats to clear away dense invasives including multiflora rose and bittersweet. An Amherst-based company called Goat Girls http://www.thegoatgirls.comcan be hired for this purpose. Contracting goats can be quite expensive, and in our experience the results are not always reliable, so their possible use at ELM could be considered experimental.

In general we do not recommend new plantings because they are expensive and labor-intensive, requiring a high level of ongoing maintenance after the plants are in, with no guarantee of survival in a highly competitive environment. However, planting small patches of wildflowers *to* attract pollinating insects could be feasible and beneficial if annual maintenance is not needed.

The success of ongoing management will depend partly on the continued monitoring of progress in influencing the balance of plant species on the property. An annual assessment carried out in mid-summer would allow regular evaluation of changes in critical plant populations and adjustment of the following year's management steps.

We hope that the recommendations in this report will supplement management *steps* already being pursued for the large open field of the meadow itself.

OVERALL GOALS AND RECOMMENDED MANAGEMENT STEPS

- Maximizing biodiversity of native shrubs and trees. Many field edges have been swallowed up by species like multiflora rose, staghorn sumac (a beneficial species in some situations), glossy buckthorn, and Oriental bittersweet. Those are all present in the ELM edge, but are joined by healthy, beneficial populations of species like gray dogwood, quaking aspen, winged sumac, red raspberry, crabapple, and eastern redcedar. Selective mowing of undesirables in a way that leaves and favors advantageous species will require a knowledgeable mowing contractor and continuing efforts not to fall behind the growth of invasives.
- Keep the edge in a mix of shrubs and herbaceous plants with scattered trees. Maximum diversity of edge-dwelling birds, insects, and small mammals depends on maintaining a wide range of species that produce a variety of mast (nuts and berries), attract pollinating insects over the entire spring and summer seasons, and add scenic interest.
- Protect colonies of interesting native grasses and herbaceous plants (e.g. little bluestem, wild orpine, square-stemmed monkeyflower). This will add to the visual and ecological diversity of the site.
- Protect and enhance fruit- and nut-bearing trees and specimen trees (e.g. apple, crabapple, shagbark hickory). The appearance of the edge and the health of important, selected large and small trees can be significantly improved by removing competing vines and shrubs that are on and around them. Quaking aspens, apples, crabapples, and the large shagbark hickory near the entrance trail will all benefit from opening up the area immediately around them. This is a long-accepted measure for improving the vigor of fruit-bearing woody plants.
- Monitor and protect bird nesting spots (e.g. nests of song sparrow, indigo bunting, rose-breasted grosbeak). A thorough breeding-bird inventory done in June will help identify specific nesting sites. Birds seen in April and May are likely to be passing through, but birds (especially singing males) recorded in June can be assumed to be nesting.
- Develop or encourage stable stands of self-perpetuating native shrubs and trees (e.g. gray dogwood, quaking aspen, virgin's bower, winterberry). Gray dogwood tends to grow in dense masses that keep competition out. Quaking aspen develops dense clones that spread by root suckers. Virgin's bower spreads across adjacent low vegetation in solid mats. Winterberry grows individually or in large

bunches. Those are all attractive, valuable, or interesting species that will benefit from the removal of immediate competition by cutting or mowing.

- Eliminate early invaders with very small current populations (e.g. winged euonymus, Morrow's honeysuckle, common buckthorn, purple loosestrife). Only a few of each of those species appear to be present at ELM. Periodic inspections of the edge for unwanted arrivals should be followed, if any are found, by immediate eradication efforts. Invasives like glossy buckthorn, autumn olive, Oriental bittersweet, and multiflora rose are so well established that eradication (as opposed to spot control) is beyond the realm of possibility.
- Prevent established invaders (e.g. glossy buckthorn, Oriental bittersweet, multiflora rose) from expanding by implementing a combination of mowing along the edges of established invasive colonies and (if RGT policy allows) selective cutting with stem herbicide treatment.
- Inspect the property regularly for the possible arrival of new invaders (e.g. black swallowwort, Japanese stiltgrass). Periodic inspections of the edge for unwanted arrivals should be followed, if any are found, by immediate eradication efforts.
- Enhance populations of butterfly-attractant plants (e.g. common milkweed). Where they don't interfere with other goals for the field and edge, milkweeds are valuable in attracting monarch butterflies and other pollinators.
- Experiment with adding a pollinator patch of wildflowers similar to that on the abutting land of Sheila Seaman. To help bolster regionally declining populations of pollinating insects, (as well as creating stunning visual enhancement) one or more additional patches could be planted ***in*** a mix of flowers attractive to a variety of insects throughout the growing season. Sheila's experience has been that after the initial planting, no annual maintenance has been necessary, although typically, work may be needed to keep weeds out.
- Identify a few spots where mowed or cleared trail stubs off the main mowed trail could lead to interesting or scenic spots. One of them is at the northwest side of the field, where a trail to the boundary meets a picturesque white pine stand on adjacent land to the west. There is already a short trail to the old distillery off the north end of the field.
- Retain sparse vegetation and bare soil for potential turtle nesting in an area just north of the stream, near the east side of the property. This sandy area should be reasonably easy to keep in open condition with occasional mowing late in the summer after turtle nesting is finished.
- Identify practical targets for volunteer work days.
- Identify long-range targets for ongoing low-budget maintenance.

The following are specific recommendations for immediate, short-term, and long-term action. Asterisked * items could be accomplished by supervised volunteers.

1. **Immediate (2015) actions.**

- Hand or chain-saw clear around the large shagbark hickory (Section 1) and crabapples (Sections 1, 6, 7, 10). *
- Remove populations of invasive purple loosestrife (Sections 4 and 10) before the flowers go to seed. * Note that most of the purple loosestrife at the north end of the field is in the field proper next to Section 10, but a few groups of plants are outside the perimeter trail in the edge area.
- Hand-pull and remove the few spotted knapweed plants in the field just south of Section 5 before the plants go to seed this fall. Wear gloves to avoid potential skin irritation. The present population is quite small and should be eliminated before it spreads.
- If there is time, hand cut common buckthorn (Sections 4, 9, 10), winged euonymus or burning bush (Section 8), and Morrow's honeysuckle (Section 8). If there is no time in 2015, this work could begin in 2016. *
- Conduct two brush-hog mowing operations in Section 1 to control goldenrods and woody plants.
- Hand-cut the few glossy buckthorns and multiflora rose stems that are among the red raspberry patches in sites to be flagged (Sections 1, 6). *
- Hand-cut common buckthorn and black cherry stems that are coming into the sandy, little bluestem knoll (Section 9). *
- Clean out bluebird/tree swallow nest boxes and anchor the ones that are on round steel poles so they don't rotate in the wind. *

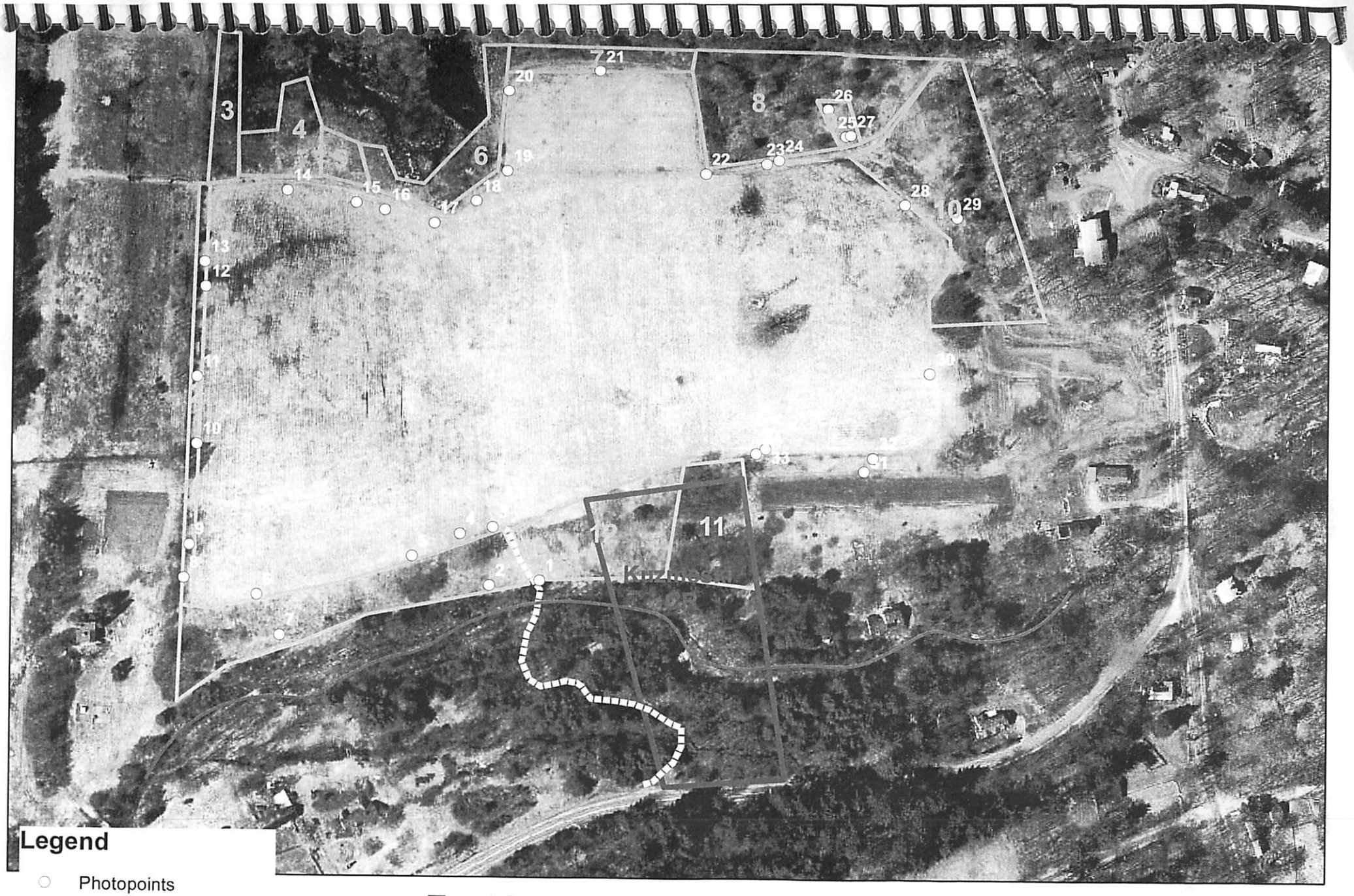
2. Short-term management (2016-2018).

- Arrange an ongoing contract with a custom brush-hog mower who can tailor regular mowing (once a year in some spots, twice a year in a few other spots, and once every three years in others) to the plant-management effort. Supervise the mowing as needed to accomplish the mowing goals outlined in this report.
- Hand-cut choking bittersweet and multiflora rose vines from eastern redcedars in Section 8. *
- Use heavy machinery or goats to cut, grind up, or eat multiflora rose and bittersweet that is climbing the apple trees in Section 8. Goats tend to graze on everything within reach, so they could be fenced into a specific area of dense invasives to clear it out.
- Consider establishing a side trail from the field into the white pine stand just west of Section 7. In Section 10, move the side trail to the distillery farther to the north to reach the main section of the old foundation. Consider adding interpretive historical signage and a bench or picnic table.
- In Section 10, plow and re-seed 1/10 acre (about 65 x 65 ft) with a blend of flowers attractive to pollinators over the entire growing season. Sheila Seaman has successfully established a no-maintenance wildflower meadow for pollinators using a seed mix from Ernst Conservation Seeds in Meadville, PA. Mike Fiely, who creates the seed mixes there, said he could come up with a

pollinator mix that will have something blooming every week from late-May through late September. Planting would occur in the fall. The process would involve tilling up the goldenrod, then planting about 1# of seed in the 1/10 acre plot, then rolling it so the seeds come into firm contact with the ground. Mike Fiely can be reached at (800) 873-3321 for consultation. If the effort is successful, it could be replicated at additional sites along the edge or within the meadow itself. It should be accompanied by annual monitoring for new occurrences of invasive plants

3. **Long-term management (2019-2024).**

- Try using goats to eat and remove bittersweet in Section 8 north of the trail. Very little besides bittersweet is growing here, so the downside of desirable plants' being eaten is minimal.
- Continue to work at gradually reducing the clumps of multiflora rose and glossy buckthorn in Sections 2, 4, 5, 6, and 7 with chain saws and loppers if volunteers are willing. *
- Continue the effort to keep an area around the big shagbark hickory and the smaller crabapples and apple trees free of competing vines and invasive shrubs. This will require periodic cutting and mowing. Stems of climbing vines can be cut at the base (with herbicide applications if RGT is interested in augmenting mechanical control) without having to pull the vines out of the trees. *
- Continue regular, supervised brush-hog mowing of the sites identified above.
- Continue monitoring for new occurrences of invasive plants.



East Leverett Meadow Edge Management Sections and Photopoints

Conservation Works LLC, June 2015
MassGIS 2009 orthophoto

East Leverett Meadow Edge Habitat: Management Recommendations by Section

Section 1:

Plants to encourage: large shagbark hickory tree, red raspberry, quaking aspen, eastern redcedar, gray dogwood, common milkweed, established crabapples, established colonies of winged sumac and staghorn sumac.

Other features of interest: poor, bare soil north of stream—maintain bare soil as potential turtle nesting area. Allegheny ant mound, active song sparrow nest.

Plants to limit: bittersweet and grape vines climbing hickory and redcedar, multiflora rose around hickory, glossy buckthorn near large crabapple, scattered individual staghorn sumac plants, discourage goldenrod.

Methods:

- Hand cutting of vines, and in turtle nesting area individual woody tree and shrub seedlings.
- Brush-hog every 3 years along edge of woods to keep them from encroaching.
- Mow remainder 2x/year, avoiding desirable plants.

Section 2

Plants to encourage: highbush blackberry, common elderberry, arrowwood, silky dogwood, gray dogwood, quaking aspen, willow sp.

Other features of interest: water hemlock, square-stemmed monkey flower.

Plants to limit: glossy buckthorn, multiflora rose, grapevines on quaking aspen saplings.

Methods:

- Mow blackberry every 3 years to limit buckthorn and other woody plants.
- Hand cut multiflora rose canes where they occur individually.
- If possible, clear out multiflora rose and grapevines on saplings.
- Too much glossy buckthorn to treat.

Section 3

No management here—invasives too well established.

Section 4

Plants to encourage: dogwoods, willow sp, speckled alder, boneset.

Plants to limit: purple loosestrife, glossy and common buckthorns, multiflora rose.

Methods:

- Hand pull purple loosestrife soon before it goes to seed. Check for it in subsequent years.
- Too much of the other invasives to attempt control at this point.

Section 5

Plants to encourage: black cherry, dogwood, arrowwood

Plants to limit: glossy buckthorn, multiflora rose, spotted knapweed

Methods:

- Hand pull spotted knapweed at the field edge before it goes to seed. Pull at the base to remove the taproot. Wear gloves to avoid possible skin irritation. It's important to eradicate the few plants now present before they spread.

Section 6

Plants to encourage: crabapple, red raspberry, winterberry, speckled alder.

Other features of interest: few invasive plants present.

Plants to limit: virgin's bower and grapevine.
Methods:

- Hand cut grapevine and virgin's bower from crabapple tree,
- Hand cut out a few buckthorns and multiflora rose in raspberry patch.
- Hand cut the few buckthorn shrubs in the northern part of the section.

Section 7

Plants to encourage: crabapple, dogwoods, willow, speckled alder.
Other features of interest: shady white pine grove along property boundary.
Plants to limit: glossy buckthorn, multiflora rose.
Methods:

- Mow around crabapple tree at east end of section.
- Clear trail—as either stub trail or short loop trail—into pine grove.
- Install bench in pine grove.

Section 8

Plants to encourage: large apple trees, winterberry, redcedar, dogwoods.
Other features of interest: nest boxes.
Plants to limit: multiflora rose, bittersweet, glossy buckthorn, Morrow's honeysuckle, winged euonymus.
Methods:

- Use large machine to cut away and grind up multiflora rose to free up apple trees and reduce rose population in the northeast corner of the property north of the trail.
- Alternatively, use goats to eat dense multiflora rose and bittersweet in the vicinity of the apple trees and north of the trail.
- Hand pull or cut individual euonymus (burning bush) plant.
- Hand or machine cut multiflora rose and bittersweet climbing into redcedar.

Section 9

Plants to encourage: little bluestem grass, dogwood.
Plants to limit: common buckthorn, black cherry.
Methods:

- Hand cut common buckthorn and black cherry to prevent encroachment into little bluestem area.

Section 10

Plants to encourage: crabapples, gray dogwood.
Other features of interest: old distillery.
Plants to limit: common buckthorn, staghorn sumac.
Methods:

- Mow 2x/year to discourage goldenrod.
- Alternatively, mow only every 3 years to get buckthorn and other woodies down. Leave crabapples and clump of gray dogwood but do cut staghorn sumac.
- Mow path to old distillery, mow vicinity.
- Install interpretive sign and bench or even picnic table—nice shady location.

Section 11

No management here—invasives too well established.

Section 12

Plants to encourage: crabapple, silky dogwood.
Plants to limit: glossy buckthorn, autumn olive.
Methods:

- Mow every 3 years. Leave dogwoods and crabapples.

Management section>>>>	1	2	3	4	5	6	7	8	9	10	11	12
Management recommended--see management description for details												
Mow every 3 years	X	X				X	X	X		X		X
Mow annually around tree	X						X					
Mow twice a year to control goldenrod	X											
Hand cut vines from trees	X	X				X		X				
Hand cut multiflora rose from around trees	X							X				
Hand cut individual plants of invasive species		X		X		X						
Hand cut individual shrub and tree seedlings	X								X			
Machine or goat removal of multiflora rose from around trees								X		X		
Do not treat--invasives too established or no treatment necessary			X		X					X	X	
Clear a trail and possibly install a bench							X			X		
Monitor and clean nest boxes	X							X				
Install interpretive sign										X		

East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
1	canopy	shagbark hickory	1	
1	canopy	crabapple	1	
1	shrub	glossy buckthorn	2	invasive
1	shrub	gray dogwood	1	
1	shrub	dwarf (winged) sumac	1	
1	shrub	staghorn sumac	1	
1	shrub	crabapple	+	
1	shrub	black cherry	+	
1	shrub	red cedar	+	
1	shrub	autumn olive	+	invasive
1	shrub	red raspberry	+	
1	shrub	lowbush blueberry	+	
1	shrub	white pine seedlings	+	
1	shrub	black oak seedlings	+	
1	shrub	aspen seedlings	+	
1	shrub	meadowsweet	+	
1	shrub	shagbark hickory seedlings		
1	vine	bittersweet	1	invasive
1	ground	grass spp.	2	
1	ground	goldenrod spp.	1	
1	ground	common milkweed	+	
1	ground	asparagus	+	
1	ground	yarrow	+	
1	ground	cladonia lichen	+	
1	ground	moss spp.	+	
1	ground	sheep sorrel	+	

Cover: 5 = 75-100% 4= 50-75% 3= 25-50% 2 = 5-25%
1 = <5%, many individuals + = <5%, 2-20 individuals r = <5% , single

East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
2	canopy	red maple	2	
2	canopy	black cherry	2	
2	canopy	trembling aspen	+	
2	canopy	tamarack	r	
2	canopy	white pine	r	
2	canopy	choke cherry	r	
2	shrub	glossy buckthorn	3	invasive
2	shrub	silky dogwood	3	
2	shrub	gray dogwood	3	
2	shrub	trembling aspen	1	
2	shrub	northern arrowwood	+	
2	shrub	multiflora rose	+	invasive
2	shrub	meadowsweet	r	
2	shrub	elderberry	r	
2	shrub	pussy willow	r	
2	vine	grape	r	
2	ground	goldenrod spp.	3	
2	ground	sensitive fern	3	
2	ground	grass spp.	2	
2	ground	sedges spp.	1	
2	ground	soft rush	+	
2	ground	water hemlock	+	
2	ground	square-stemmed monkey flower	+	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
3	canopy	red maple	4	
3	shrub	glossy buckthorn	2	invasive
3	shrub	silky dogwood	1	
3	shrub	northern arrowwood	1	
3	shrub	meadowsweet	1	
3	shrub	multiflora rose	1	invasive
3	shrub	winterberry	1	
3	shrub	speckled alder	r	
3	ground	goldenrod spp.	1	
3	ground	sensitive fern	4	
3	ground	Virginia creeper	1	
3	ground	reed canary grass	1	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
4	shrub	silky dogwood	2	
4	shrub	silky willow	2	
4	shrub	glossy buckthorn	2	invasive
4	shrub	multiflora rose	1	invasive
4	shrub	northern arrowwood	1	
4	shrub	winterberry	+	
4	shrub	black cherry	+	
4	shrub	meadowsweet	+	
4	shrub	speckled alder	+	
4	shrub	common buckthorn	r	invasive
4	vine	grape	+	
4	ground	sensitive fern	3	
4	ground	goldenrod spp.	1	
4	ground	common cinquefoil	+	
4	ground	soft rush	+	
4	ground	common reed	+	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
5	shrub	glossy buckthorn	2	invasive
5	shrub	multiflora rose	+	invasive
5	shrub	gray dogwood	+	
5	shrub	black cherry	r	
5	shrub	northern arrowwood	r	
5	ground	goldenrod	5	
5	ground	sensitive fern	1	
5	ground	cleavers	+	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
6	canopy	red maple	1	
6	shrub	red raspberry	+	
6	shrub	winterberry	+	
6	shrub	speckled alder	+	
6	ground	virgin's bower	3	
6	ground	grass spp.	3	
6	ground	goldenrod	3	
6	ground	Queen Anne's lace	1	
6	ground	sensitive fern	1	
6	ground	herb robert	+	
6	ground	common milkweed	+	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
7	canopy	cottonwood	+	
7	canopy	gray birch	+	
7	shrub	gray dogwood	2	
7	shrub	glossy buckthorn	1	invasive
7	shrub	speckled alder	+	
7	shrub	multiflora rose	+	invasive
7	shrub	winterberry	+	
7	shrub	white pine sapling	+	
7	shrub	black cherry	r	
7	shrub	pussy willow	r	
7	shrub	crabapple	r	
7	vine	grape	+	
7	ground	virgin's bower	+	
7	ground	common milkweed	+	
7	ground	sensitive fern	+	
7	ground	marsh fern	+	
7	ground	cinnamon fern	+	
7	ground	poison ivy	+	
7	ground	wild madder	+	
7	ground	goldenrod spp.		

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
8	canopy	apple	2	
8	canopy	red cedar	+	
8	canopy	red maple	+	
8	canopy	white pine	+	
8	shrub	gray dogwood	2	
8	shrub	glossy buckthorn	2	invasive
8	shrub	multiflora rose	1	invasive
8	shrub	winterberry	1	
8	shrub	black cherry	1	
8	shrub	Morrow's honeysuckle	+	invasive
8	shrub	meadowsweet	+	
8	shrub	chokecherry	+	
8	shrub	common buckthorn	+	invasive
8	shrub	burning bush	r	invasive
8	vine	bittersweet	+	invasive
8	vine	grape	+	
8	ground	goldenrod spp.	2	
8	ground	sensitive fern	1	
8	ground	virgins's bower	1	
8	ground	jewelweed	+	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
9	canopy	black cherry	2	
9	shrub	gray dogwood	2	
9	shrub	common buckthorn	1	invasive
9	shrub	meadowsweet	1	
9	shrub	Morrow's honeysuckle	r	invasive
9	ground	little bluestem grass	5	
9	ground	wild orpine (a sedum)	1	
9	ground	yarrow	+	

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?	Notes
10	canopy	crabapple	1		
10	canopy	staghorn sumac	1		
10	canopy	Norway maple	+	invasive	near distillery
10	canopy	black cherry	+		near distillery
10	canopy	sugar maple	+		near distillery
10	canopy	red oak	r		
10	shrub	multiflora rose	2	invasive	
10	shrub	silky dogwood	1		
10	shrub	blackberry	1		
10	shrub	common buckthorn	+	Invasive	
10	shrub	sweet fern	+		
10	shrub	common barberry	+	invasive	1 plant at S end
10	shrub	red raspberry	+		near distillery
10	vine	bittersweet	1	invasive	very dense patch, 50' x 50' at north end
10	vine	grape	+		
10	ground	goldenrod spp.	3		
10	ground	Virginia creeper	+		
10	ground	celandine	+		near distillery
10	ground	common milkweed	+		
10	ground	narrow-leaved bittercress	+	invasive	near distillery

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East Leverett Meadow
Edge Plant Inventory

Section	Layer	Species	Cover	Invasive?
11	canopy	black cherry	3	
11	canopy	white pine	1	
11	shrub	glossy buckthorn	1	invasive
11	shrub	Morrow's honeysuckle	1	invasive
11	shrub	multiflora rose	1	invasive
11	vine	bittersweet	+	invasive
11	vine	grape	+	
11	ground	goldenrod spp.	2	

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East Leverett Meadow
Edge Plant Inventory

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12	canopy	white pine	+	
12	canopy	gray birch	+	
12	shrub	crabapple	+	
12	shrub	silky dogwood	+	
12	shrub	autumn olive	1	invasive
12	shrub	meadowsweet	+	
12	shrub	glossy buckthorn	+	invasive
12	ground	goldenrod	4	
12	ground	grass spp.	3	
12	ground	common milkweed	1	
12	ground	bindweed	1	
12	ground	stinging nettle	+	

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