

# Wet Meadow Toolkit

## UPPER BROWNING FIELDS

## EXISTING CONDITIONS

Upper Browning Fields is a 13.5-acre conservation property owned by the Town of Lincoln, and managed by the Lincoln Conservation Department. The site is highly diverse in native plant species composition, and includes a mix of wet meadow and transitional wet-to-dry meadow habitat. A perennial stream bisects the site running north to south, and an intermittent stream seeps into the center of the site from the north, creating a wet meadow complex that dominates the majority of the property. A second wet meadow/shrubland exists in the eastern portion of the site. The entire property is MassWildlife Natural Heritage and Endangered Species Program (NHESP) Priority Habitat of Rare Species. A horse ring in the northwest corner of the property is used by the public a few times a year and contributes to overflow parking in the old pasture portion of the site which is south of the entrance.

Native plant species dominate Upper Browning Fields in both wet and dry areas as well as in full sun and shaded portions of the site, contributing to its overall diversity. “Old Pasture” portions of the site (refer to map on opposite page) closest to Weston Road and Conant Road are somewhat less diverse in terms of plant species, and include significant quantities of non-native agricultural grasses. Still, *B. fervidus*, a threatened bumblebee species and one of the target species for this Plan, was found nesting adjacent to the southwest corner of the horse ring by Dr. Gegear, in one of the most highly disturbed portions of the site due to its proximity to overflow parking during events. Similarly, numerous native plant species of high value to threatened and at-risk pollinators were found in marginal areas of the site, alongside the trail and in the shade along the forest edges, oftentimes at risk of competition from more well established plant communities. Refer to the Ecological Communities map on pages 56-57 for a more detailed examination of the plant communities found at Upper Browning Fields.

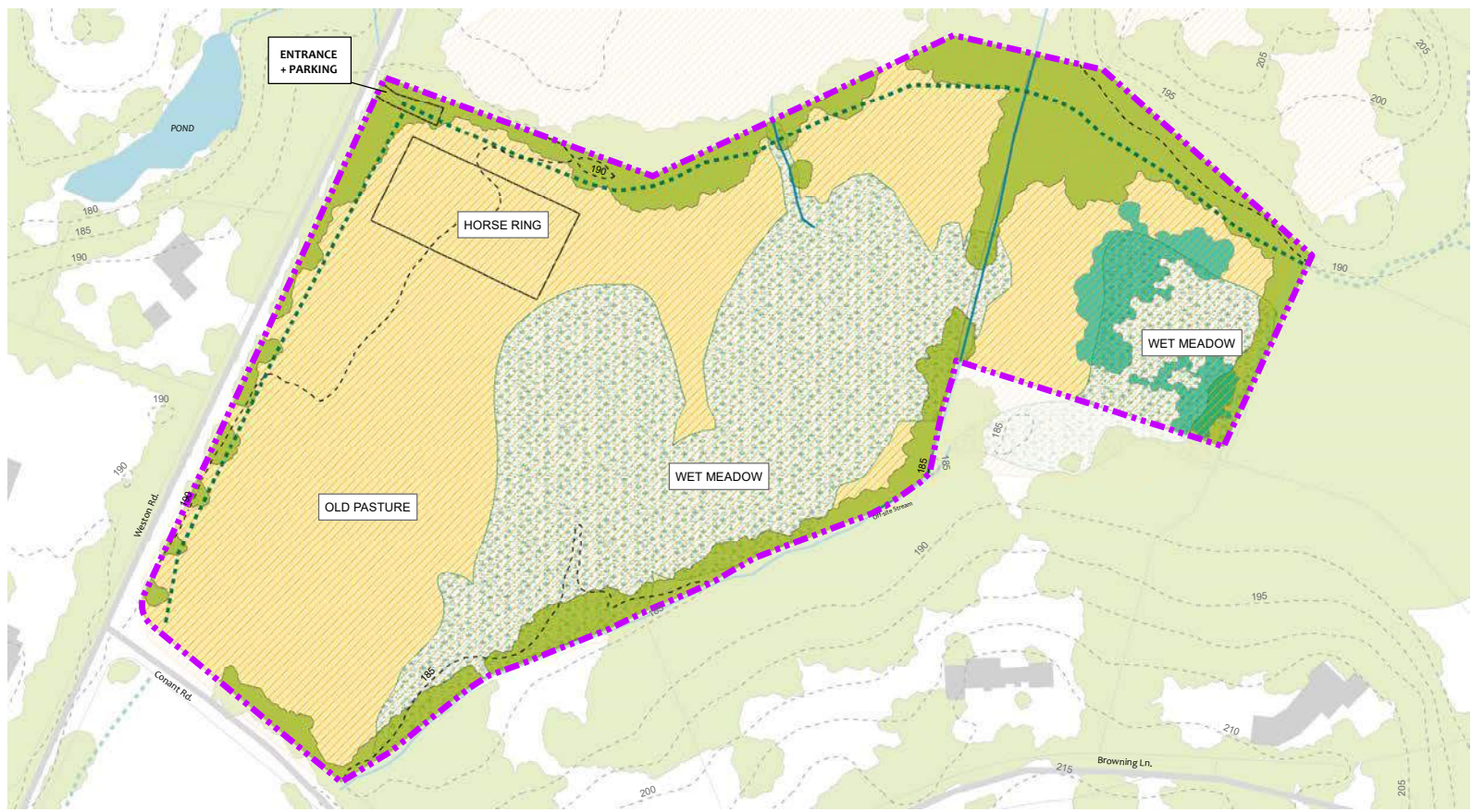
Invasive *Frangula alnus* (Glossy buckthorn) as well as *Lythrum salicaria* (Purple loosestrife) pose the

biggest management challenges, as the buckthorn in particular is well established in both wet and dry meadow areas. Glossy buckthorn, responds favorably to mowing, and mature plants that are cut near the base sprout vigorously (CABI). Cutting alone is usually not an effective method for glossy buckthorn removal. If herbicides are not an option, as is the case on most, if not all of Lincoln’s conservation properties, it is recommended to topkill Glossy buckthorn by fire in late spring just after it has leafed out. **Spot burning using a backpack torch is a highly effective method for removing Glossy buckthorn, followed closely by the replanting of desired native species** (Nature Conservancy). A qualified technician should be hired to conduct spot burning. Girdling and buckthorn bags have also been demonstrated to be effective removal methods (CABI). Younger buckthorn plants can be removed by handpulling or grubbing, as can Purple loosestrife. Galeruccella beetles have been an effective biocontrol for Purple loosestrife; unfortunately, these European beetles are no longer being bred for release.

Large conservation sites are complex and the Conservation Department’s management practices reflect this complexity. The maps on pages 58-59 present strategies for stewarding the varied plant communities, habitat types and ecological conditions for threatened and at-risk pollinator species at Upper Browning Fields. Replication of these strategies can be scaled for private landowners as well.

While much in the way of nectar, pollen, host plants and nesting sites is already present at Upper Browning Fields, there are a whole suite of plants which can be added to the site in order to strengthen its ecosystems and expand its biodiversity. This will also help wet meadow portions to regenerate following removal of glossy buckthorn and purple loosestrife.

*Opposite top: landscape conditions at Upper Browning Fields include significant areas of highly diverse wet meadow and upland meadow habitat. Numerous native plants which support at-risk pollinator species are found on the site, including Eutrochium maculatum (Spotted Joe-Pye weed). Bottom: basemap used for initial site analysis at Upper Browning Fields. Wet Meadow areas were much larger than state-level data, and were tracked on site using GPS.*



- Upper Browning Property
- Buildings
- Tree Canopy
- Roads
- Contours (5 ft)
- Streams
- Trails
- Pasture
- Wetland Shrubs
- Wet Meadow
- NHESP Priority Habitat of Rare Species

**UPPER BROWNING FIELDS BASEMAP**  
**Landscape Interactions**

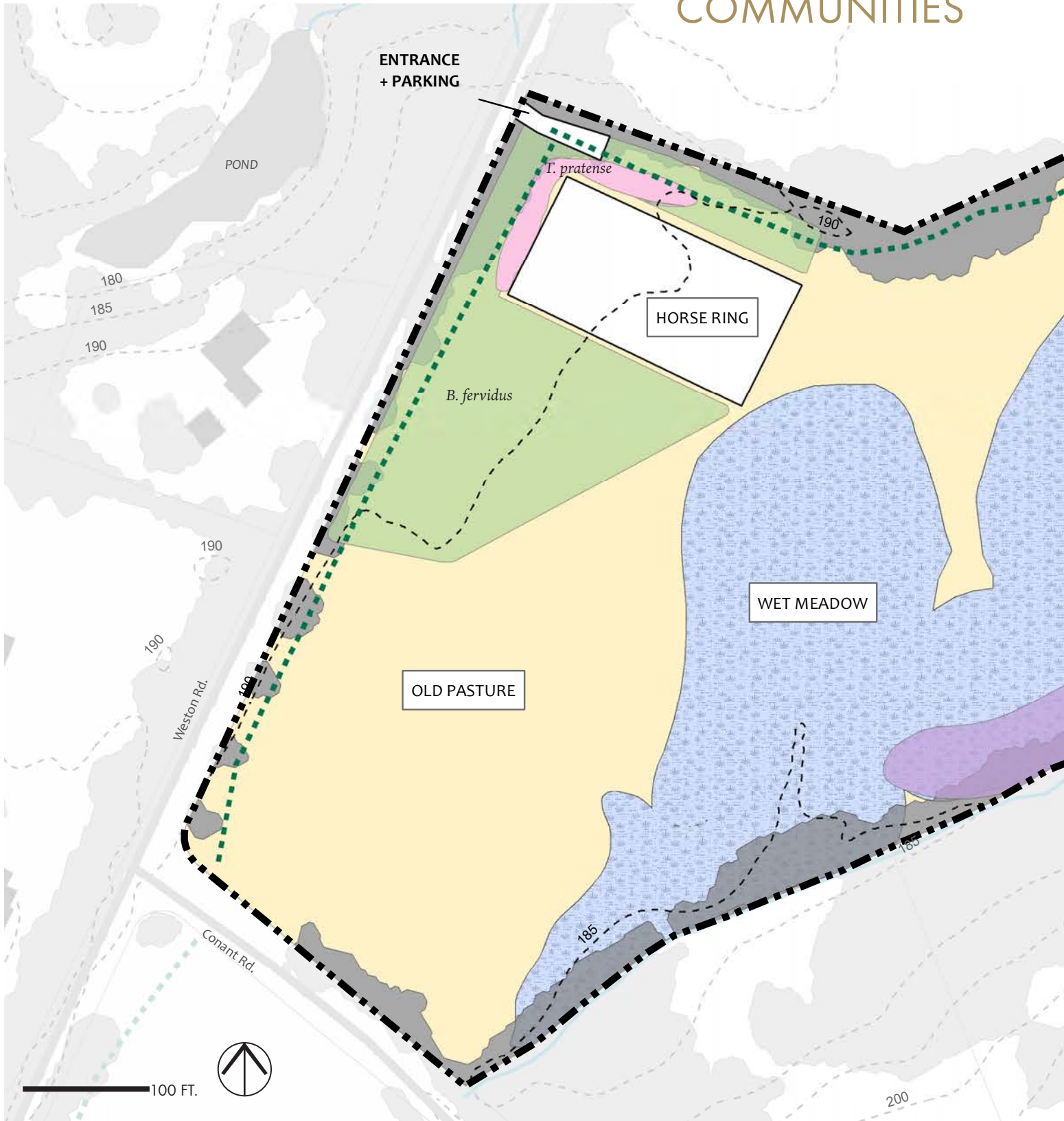
Property Size: 13.5 acres  
 Location: Lincoln, MA  
 Client: Lincoln Land Conservation Trust

0 25 50 100 Feet

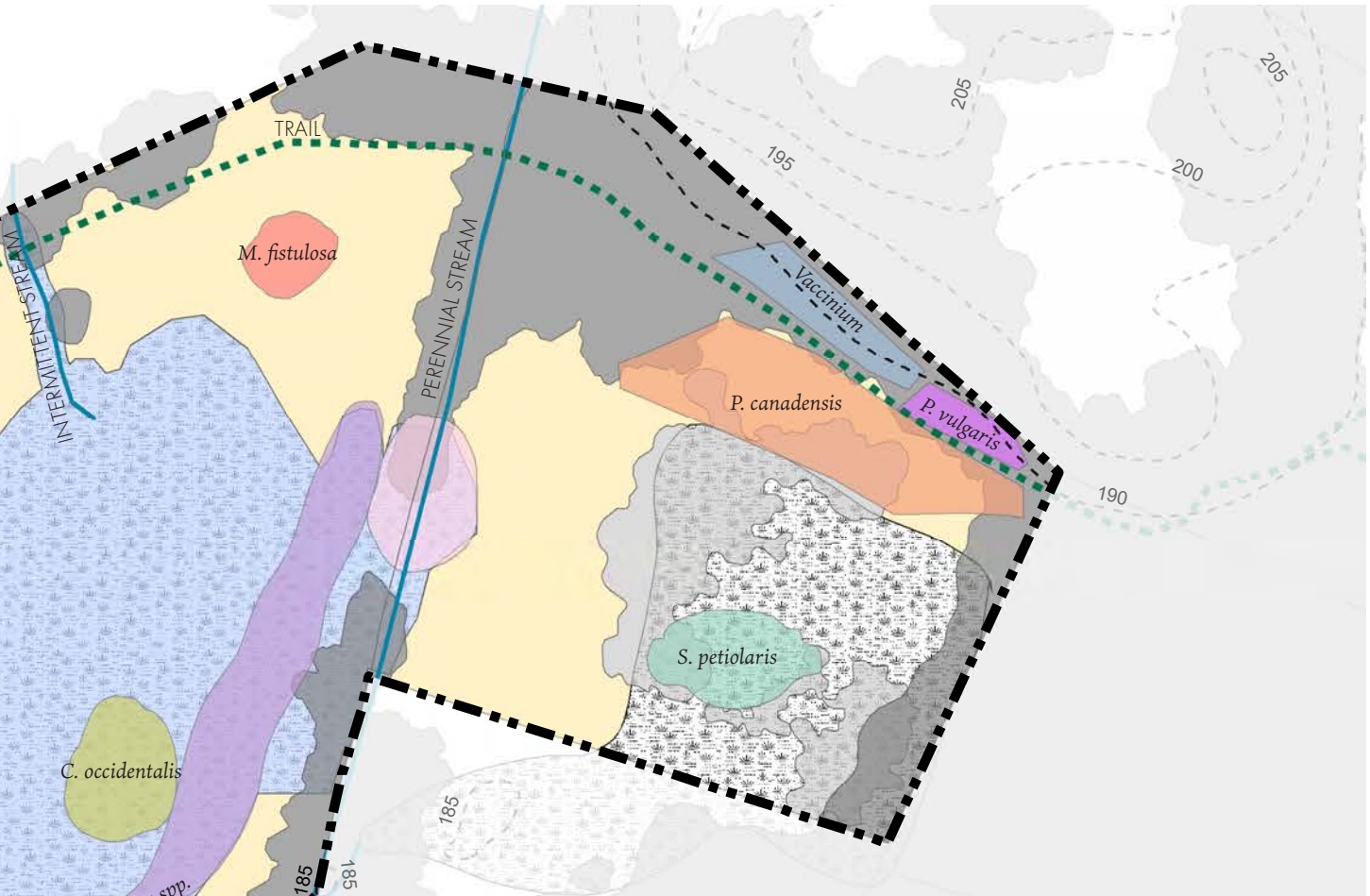
# Wet Meadow Toolkit

UPPER BROWNING FIELDS

## ECOLOGICAL COMMUNITIES



This map of plant species locations on Upper Browning Fields and the mowing/management guidelines presented in the map on the following pages were provided to Lincoln Conservation Department staff and LLCT in the early fall of 2020, to help interpret the varying ecosystems and plant communities present on the site, and understand the diverse management methods each unique area requires in order to better steward the landscape for at-risk pollinators.



**WET MEADOW**

Species present: *Cephalanthus occidentalis* (Buttonbush), *Asclepias incarnata* (Swamp milkweed), *Spiraea alba* (Meadowsweet), *Spiraea tomentosa* (Steeplebush), *Verbena hastata* (Blue vervain), *Eutrochium maculatum* (Spotted Joe-Pye weed), *Solidago juncea* (Early goldenrod) and other *Solidago* spp., *Carex* spp., *Lysimachia* spp. (Native yellow-loosestrife)

**OLD PASTURE/WET MEADOW TRANSITION AREAS**

Species present: *Solidago rugosa* (Wrinkleleaf goldenrod), *Euthamia graminifolia* (Grass-leaved goldenrod), *Solidago canadensis* (Canada goldenrod), *Eutrochium maculatum* (Spotted Joe-Pye weed).

**ADJACENT CENTRAL STREAM**

Species present: *Rosa palustris* (Swamp Rose), *Cephalanthus occidentalis* (Common buttonbush), *Impatiens capensis* (Jewelweed).

**BOMBUS FERVIDUS NESTING SITE**

*Lysimachia* spp. (Native yellow-loosestrife)

*Prunella vulgaris* ssp. *lanceolata* (Common selfheal)

*Pedicularis canadensis* (Canadian wood betony)

*Vaccinium angustifolium* (Lowbush blueberry), *V. corymbosum* (Highbush blueberry)

*Salix petiolaris* (Meadow willow)

*Trifolium pratense* (Red clover)

*Monarda fistulosa* (Wild bergamot)

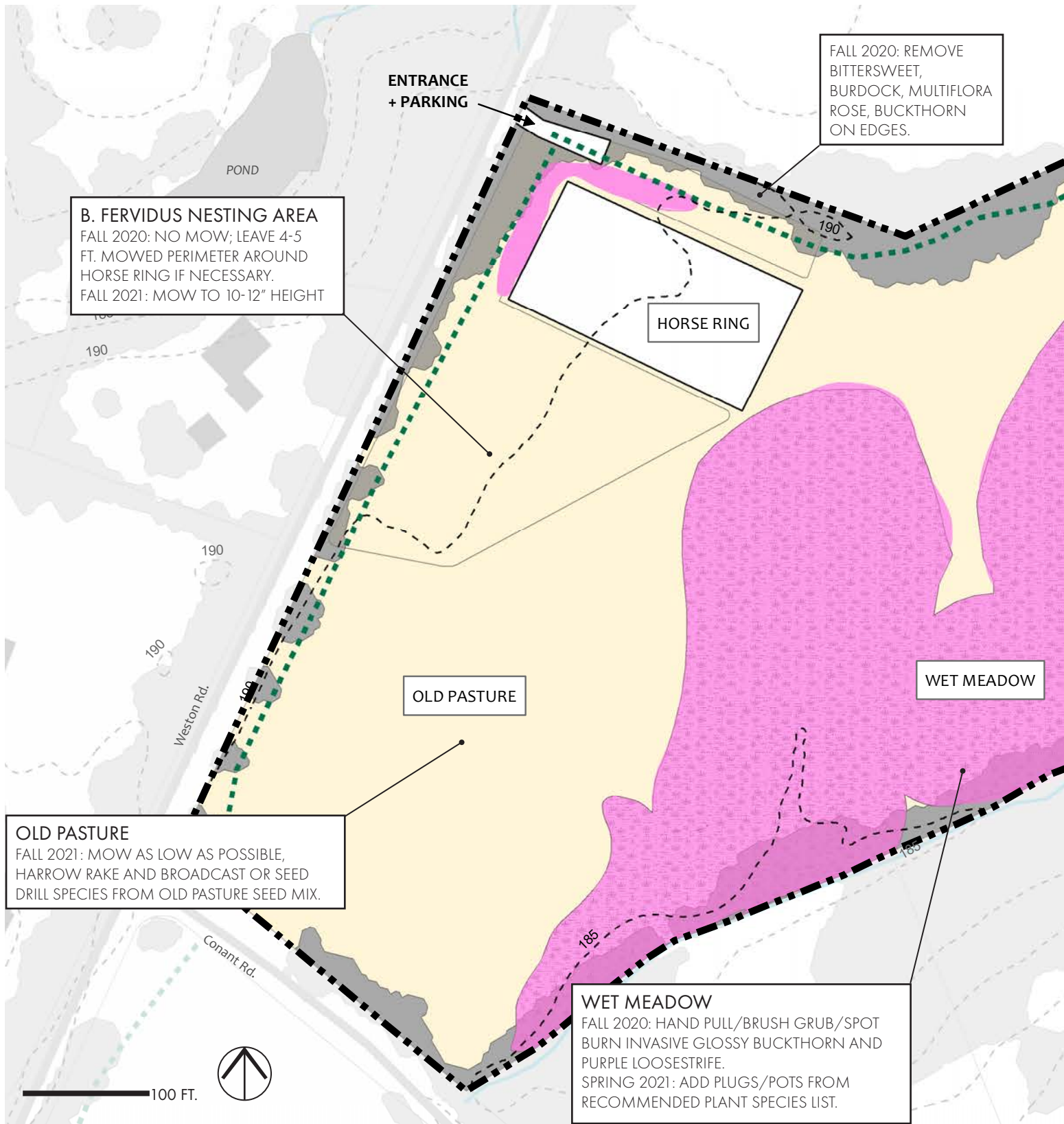
*Cephalanthus occidentalis* (Buttonbush)

# Wet Meadow Toolkit

UPPER BROWNING FIELDS

LANDSCAPE | INTERACTIONS

16 Center Street #426  
Northampton, MA 01060  
landscapeinteractions.com



# SITE CONDITIONS

MEDIUM SOILS & WET SOILS

FULL SUN & PART SHADE

CONSERVATION HABITAT

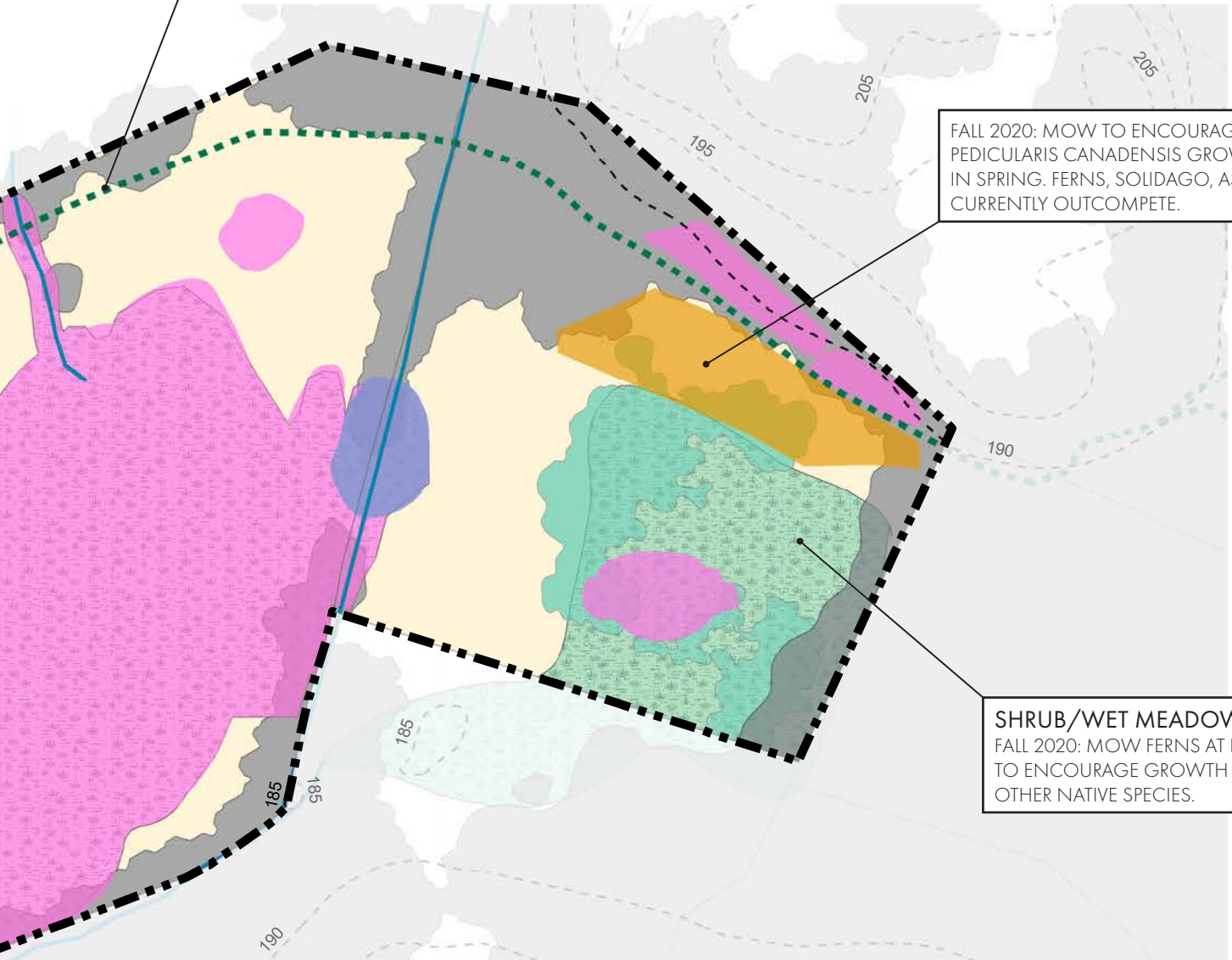
WET MEADOW

## TRAILSIDE

SPRING 2021: SOD CUT ALONG MOWED PATH EDGES, 2-4 FT WIDE ON ONE OR BOTH SIDES; PLANT PENSTEMON, MONARDA, BAPTISIA, PRUNELLA, EUTROCHIUM, SOLIDAGO, ASTERS, NATIVE GRASSES AND OTHERS FROM LIST.

FALL 2020: MOW TO ENCOURAGE PEDICULARIS CANADENSIS GROWTH IN SPRING. FERNS, SOLIDAGO, ASTERS CURRENTLY OUTCOMPETE.

**SHRUB/WET MEADOW**  
FALL 2020: MOW FERNS AT EDGES TO ENCOURAGE GROWTH OF OTHER NATIVE SPECIES.



- NO MOW AND SPOT REMOVE INVASIVES (AREA OF ESTABLISHED NATIVE PLANTS AND WET MEADOW)
- MOW FALL 2020 (SEE NOTES)
- MOW FALL 2021 (SEE NOTES)
- MOW EDGES FALL 2020 (SEE NOTES)
- REMOVE TREE CANOPY TO PREVENT SHADING

# Wet Meadow Toolkit

## UPPER BROWNING FIELDS

### SITE ESTABLISHMENT

As mentioned, the majority of Upper Browning Fields is intact wet meadow and transitional wet-to-dry meadow habitat. The dominant management challenges are how to deal with invasive Glossy buckthorn and Purple loosestrife, as well as to what extent to dedicate staff time and resources towards invasive species removal along the trailside at the entrance to the property near the horse ring.

Because the site contains well established, diverse native plant communities in so many places, it is recommended to discontinue brush hogging the majority of the site, and in the late spring of 2021, all areas containing Glossy buckthorn in Upper Browning Fields be spot burned using backpack torches, and replanted using species from the Wet Meadow Plant List on the opposite page. Manual weed wrenches (“Pullerbear”) or brush grubbers mounted to a tractor (“Brush Grubber”) can also be utilized to remove not only buckthorn, but also Purple loosestrife, as both methods remove significant portions of a plant’s root mass.

For Trailside locations, in spring of 2021 it is recommended to mow 2-4 ft. alongside one or both sides of the existing foot path as low to the ground as possible, followed by sod cutting to remove existing vegetation. These areas can then be planted using the Trailside Plant List on the opposite page. It is also possible to smother these areas using black tarp or plastic following mowing in lieu of sod cutting, although this would require securing the material alongside all edges for the length of the trail, which is somewhat cumbersome given the scale of the site.

For Old Pasture areas, as described on the preceding page, in the fall of 2021 these upland portions of the site can be mowed low, followed by a harrow raking and then direct broadcast of seeds from the mix on

*Spot burning Glossy buckthorn is considered one of the most effective non-chemical management methods. Image courtesy Woody Invasives of the Great Lake Collaborative.*

## MANAGEMENT GUIDELINES

the opposite page; alternatively, in lieu of raking and broadcasting, these areas could be drilled if a seed drill was available.

For areas where *Bombus fervidus* nesting sites have been located, it is recommended to consult with Dr. Gegear throughout the 2021 and 2022 growing seasons, as he gathers more data in his field surveys.

**Bee nesting strips should also be created** in Upper Browning Fields for ground nesting species. Refer to page 52 of this Plan for a diagram as well as instructions.

### MAINTENANCE

Hand pulling of weeds, non-native grasses and other undesired vegetation in all recently planted areas will be necessary for numerous years following installation. For areas that are direct seeded, refer to the Mowing Regimes section in the **Old Field Toolkit Management Guidelines** on page 52.

Follow up spot burns for areas containing Glossy buckthorn will likely be necessary for several years. Girdling and buckthorn bags are also highly effective removal methods (CABI).



## UPPER BROWNING FIELDS WET MEADOW PLANT LIST

Trees	
<i>Chamaecyparis thyoides</i>	Atlantic white cedar
Shrubs	
<i>Cephalanthus occidentalis</i>	Common buttonbush
<i>Rosa palustris</i>	Swamp rose
<i>Salix bebbiana</i>	Bebb's willow (male)
<i>Salix discolor</i>	Pussy willow (male)
<i>Salix lucida</i>	Shining willow (male)
<i>Vaccinium corymbosum</i>	Highbush blueberry
<i>Vaccinium macrocarpon</i>	Large cranberry
<i>Vaccinium oxycoccos</i>	Small cranberry
Forbs	
<i>Asclepias incarnata</i>	Swamp milkweed
<i>Doellingeria umbellata</i>	Tall white aster
<i>Eutrochium fistulosum</i>	Hollow Joe-Pye weed
<i>Eutrochium maculatum</i>	Spotted Joe-Pye weed
<i>Eutrochium purpureum</i>	Purple Joe-Pye weed
<i>Impatiens capensis</i>	Spotted touch-me-not
<i>Mimulus alatus</i>	Winged monkey flower
<i>Mimulus ringens</i>	Allegheny monkey flower
<i>Rumex orbiculatus</i>	Great Water Dock
<i>Scutellaria galericulata</i>	Hooded skullcap
<i>Scutellaria lateriflora</i>	Mad dog skullcap
<i>Symphotrichum lateriflorum</i>	Calico American-aster
Graminoids	
<i>Andropogon gerardii</i>	Big bluestem
<i>Carex lacustris</i>	Lakeside sedge
<i>Carex stricta</i>	Tussock sedge
<i>Panicum virgatum</i>	Switchgrass

## UPPER BROWNING FIELDS TRAILSIDE PLANT LIST

Trees	
<i>Cercis canadensis</i>	Redbud
<i>Quercus spp.</i>	Oaks
Shrubs	
<i>Diervilla lonicera</i>	Northern bush-honeysuckle
<i>Hypericum prolificum</i>	Shrubby St. John's-wort
<i>Rosa carolina</i>	Carolina rose
<i>Rosa virginiana</i>	Virginia rose
<i>Rubus allegheniensis</i>	Common blackberry
<i>Rubus odoratus</i>	Purple-flowering raspberry
<i>Rubus pensilvanicus</i>	Pennsylvania blackberry
<i>Salix humilis</i>	Prairie willow (male)
<i>Salix petiolaris</i>	Meadow willow (male)
<i>Spiraea alba</i>	Meadowsweet
<i>Spiraea tomentosa</i>	Steeplebush
<i>Vaccinium angustifolium</i>	Lowbush blueberry
<i>Vaccinium pallidum</i>	Hillside blueberry
Forbs	
<i>Agastache scrophulariifolia</i>	Purple giant hyssop
<i>Asclepias syriaca</i>	Common milkweed
<i>Asclepias tuberosa</i>	Butterfly weed

<i>Baptisia tinctoria</i>	Yellow wild indigo
<i>Cirsium pumilum</i>	Pasture thistle
<i>Eutrochium dubium</i>	Coastal plain Joe-Pye weed
<i>Hypericum ascyron</i>	Great St. John's-wort
<i>Lupinus perennis</i>	Wild lupine
<i>Monarda didyma</i>	Scarlet bee balm
<i>Monarda fistulosa</i>	Wild bergamot
<i>Pedicularis canadensis</i>	Canadian lousewort
<i>Penstemon digitalis</i>	Foxglove beardtongue
<i>Penstemon hirsutus</i>	Northeastern beardtongue
<i>Prunella vulgaris ssp. lanceolata</i>	Common selfheal
<i>Solidago odora</i>	Sweet goldenrod
<i>Solidago speciosa</i>	Showy goldenrod
<i>Symphotrichum lateriflorum</i>	Calico American-aster
<i>Viola spp.</i>	Violets
<i>Zizia aptera</i>	Heart-leaf golden Alexanders
<i>Zizia aurea</i>	Golden Alexanders
Graminoids	
<i>Andropogon gerardii</i>	Big bluestem
<i>Carex blanda</i>	Common wood sedge
<i>Carex brevior</i>	Plains oval sedge
<i>Panicum virgatum</i>	Switchgrass
<i>Schizachyrium scoparium</i>	Little bluestem

## UPPER BROWNING FIELDS OLD PASTURE SEED MIX

Shrubs	
<i>Spiraea alba</i>	Meadowsweet
<i>Spiraea tomentosa</i>	Steeplebush
Forbs	
<i>Agastache scrophulariifolia</i>	Purple giant hyssop
<i>Asclepias syriaca</i>	Common milkweed
<i>Asclepias tuberosa</i>	Butterfly weed
<i>Baptisia tinctoria</i>	Yellow wild indigo
<i>Cirsium discolor</i>	Pasture thistle
<i>Geranium maculatum</i>	Spotted crane's-bill
<i>Hypericum punctatum</i>	Spotted St. John's-wort
<i>Lupinus perennis</i>	Wild lupine
<i>Monarda fistulosa</i>	Wild bergamot
<i>Pedicularis canadensis</i>	Canadian lousewort
<i>Penstemon digitalis</i>	Foxglove beardtongue
<i>Penstemon hirsutus</i>	Northeastern beardtongue
<i>Prunella vulgaris ssp. lanceolata</i>	Common selfheal
<i>Solidago odora</i>	Sweet goldenrod
<i>Solidago speciosa</i>	Showy goldenrod
<i>Symphotrichum lateriflorum</i>	Calico American-aster
<i>Zizia aptera</i>	Heart-leaf golden Alexanders
<i>Zizia aurea</i>	Golden Alexanders
Graminoids	
<i>Andropogon gerardii</i>	Big bluestem
<i>Carex blanda</i>	Common wood sedge
<i>Carex brevior</i>	Plains oval sedge
<i>Panicum virgatum</i>	Switchgrass
<i>Schizachyrium scoparium</i>	Little bluestem