

**Scientific Collecting Permit Application for:
New England Blazing Star (*Liatris scariosa* var. *novae-angliae*)
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Research Outline

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Introduction

New England blazing star was once widespread in Metro-Boston, including occurrences in Lexington, Concord, Carlisle, and Bedford, MA (Kane and Schmidt, 2001). However, anthropogenic sources of habitat alteration and disturbance, including: the development of suitable sandplain habitat, fire suppression and the resultant encroachment of woody vegetation, introduced invasive plant species, destructive mowing regimes, overuse of herbicides, and increased deer grazing pressure, have resulted in a large decrease in both the abundance and distribution of many sandplain-dependent wildflower species in Massachusetts. New England blazing stars, a sandplain-dependent Species of Special Concern, has declined throughout Massachusetts, particularly in relatively urbanized Middlesex County. The species is now all but extirpated from northeastern Massachusetts.

We propose to initiate small-scale reintroductions of New England blazing star in suitable habitat in four Middlesex County towns in 2016. All these projects will be part of efforts to establish small areas of forb-rich sandplain grassland habitat that would be beneficial to both the reintroduced plant species themselves and to insect pollinators that depend on these species as food sources. Our proposal for the small-scale reintroduction of *L. scariosa* var. *novae-angliae* in 2016 is part of what we hope will be continued efforts at other eastern Massachusetts sites to establish new occurrences of New England blazing star and other declining sandplain grassland wildflower species in years to come. Increasing occurrences of *L. scariosa* var. *novae-angliae* through targeted reintroductions is one of three Conservation Objectives for this species in New England outlined in Kane and Schmidt (2001).

Objectives

- Begin working towards the establishment of small areas of forb-rich sandplain grassland habitat in four conservation areas:
 - a. Whipple Hill Conservation Area, Lexington, MA
 - b. Mill Pond Conservation Area, Bedford, MA
 - c. Foss Farm Conservation Area, Carlisle, MA
 - d. Joyce Miller's Meadow Conservation Area, Lexington, MA.

In each case, *L. scariosa* var. *novae-angliae* would be introduced as one of a suite of declining sandplain forb species. (New England blazing star is the only state-listed species that we currently plan to introduce.)

- Experiment with methods to germinate seed of *L. scariosa* var. *novae-angliae*, to plant seedlings, and to manage the resulting introduced populations as a means to increase the likelihood of future successful reintroduction and management methods for this species.
- Provide habitat for declining insect pollinator species, including butterflies and bees, particularly the monarch butterfly, *Danaus plexippus*.
- Use this project as a means of informing local human residents about the need for conserving sandplain grassland habitat and the wildflower and insect species that depend on that habitat. Furthermore, we will use the project as a vehicle to directly engage local residents in sandplain grassland restoration work.

Proposed Methods

In total, we propose to transplant up to **700** *L. scariosa* var. *novae-angliae* seedlings from New England sources into four small restoration sites in the spring of 2016. Specifically, we propose the following methods:

1. Seed Sources: In autumn, 2015, we obtained several thousand *L. scariosa* var. *novae-angliae* seeds from each of two sites:
 - a. **Kennebunk Plains, Kennebunk, ME**: Seeds from this very large population were collected and donated to us by Maine Inland Division of Fisheries and Wildlife.
 - b. **Extirpated Boxford, MA Population**: Seeds from this now extirpated population were collected by Russ Hopping of TTOR and used to propagate several generations of descendants, which are maintained by TTOR in North Andover,

MA. Mr. Hopping collected seed from this managed population and donated them to Grassroots Wildlife Conservation.

2. Germination Methods: We have recruited citizen volunteers to grow New England blazing star seedlings by winter-sowing the seeds in deep cell starter trays placed within containers and keeping the seeds outdoors over the winter to naturally break dormancy. Seedlings will then be collected by GWC in the spring of 2016.
3. Planting Methods and Site Preparation: We propose to plant up to 700 *L. scariosa* var. *novae-angliae* seedlings total among all four small reintroduction sites in the spring of 2016. Site-specific plans are as follows:
 - a. Wilson Mill Conservation Area, Bedford (Lat. N42.501, Long. W71.245): Up to **50** *L. scariosa* var. *novae-angliae* seedlings may be planted in two small (ca. 50m² patches) of dry sandy upland. These small areas were cleared and scarified in the autumn of 2015 by volunteers organized by Concord Boy Scout, Alex Cancio with the approval of the Bedford Conservation Commission. Other native species to be planted at this site include: *Asclepias tuberosa*, *Monarda fistulosa*, and *Aquilegia canadensis*. The two small restoration areas will be hand weeded in spring 2016 prior to planting.
 - b. Whipple Hill Conservation Area, Lexington (Lat. N42.439, Long. W71.185): *L. scariosa* var. *novae-angliae* will be planted into two small rocky clearings (each ca. 30m²) near the summit of Whipple Hill. These areas are currently dominated by monocultures of little bluestem grass (*Schizachyrium scoparium*), and are fringed by patches of bearberry (*Arctostaphylos uva-ursi*). With the help of Lexington Girl Scouts and the Lexington Conservation Commission, we propose to remove the existing little bluestem grass cover and scarify the soil in December, 2015, leaving existing patches of bearberry undisturbed. In spring, 2016, we would plant up to to **50** *L. scariosa* var. *novae-angliae* seedlings together with seedlings of : *Asclepias tuberosa* and *Lupinus perennis*. The area would also be re-seeded with little bluestem grass.
 - c. Foss Farm, Carlisle, MA (Lat. N42.515, Long. W71.317): We propose to plant up to 100 *L. scariosa* var. *novae-angliae* seedlings as part of a project intended primarily to reintroduce *Asclepias tuberosa* to this site. Several years ago, the last known population of butterfly weed in the area was extirpated from Foss Farm as the result of trampling (Sally Zielinski, *Pers. Comm.*). Since butterfly

milkweed and New England blazing star share similar habitat requirements, we propose to also transplant up to **100** *L. scariosa* var. *novae-angliae* seedlings to Foss Farm, thus re-establishing a population of this species in Carlisle, where it was once native. The Carlisle Conservation Commission and local botanist Sally Zielinski have approved the plan to reintroduce butterfly milkweed to Foss Farm. They will consider also introducing New England blazing star, pending approval by MNHESP. Site preparation techniques for this site have yet to be finalized.

- d. Joyce Miller's Meadow, Lexington, MA (Lat. N42.434, Long. W71.205): The Lexington Conservation Commission, together with Polatin Ecological Services (PES), is working to restore ca. 2.5 acres of scrub habitat, currently dominated by glossy buckthorn (*Frangula alnus*) and other invasive species to a native-dominated grassland and savannah. The area is underlain by excessively well-drained outwash and its margins have open patches of little bluestem grass. We propose to select two ca. 500m² areas of little bluestem grass habitat and work with Lexington and PES to restore them to wildflower-rich sandplain habitat. Specific forb species that we propose to introduce include: *Asclepias tuberosa*, *A. amplexicaulis* (if we can locate a Massachusetts source of seed), *Baptisia tinctoria*, *Lupinus perennis* and up to **500** individual seedlings of *L. scariosa* var. *novae-angliae*. Site clearing activities will occur during the 2016 growing season. Depending upon the timing of the overall project, we may or may not be ready to transplant seedlings to the two proposed wildflower-rich sandplain restoration sites in 2016.

Site Management After Planting: At each site, we propose to use volunteers to hand water seedlings during dry periods in their first growing season. Transplanted *L. scariosa* seedlings will be counted and tagged and we will maintain records on their survival and on their flowering / seeding success in future years. We propose to develop a management plan for each site together with the town conservation commissions and other interested parties. At each of the four sites in this proposal, we will likely need to use primarily mechanical means (mowing) to maintain populations of sandplain grassland forbs. We will consider the use of prescribed burning if practicable at the Whipple Hill and Joyce Miller's Meadow sites and have been in conversation with Jordan McCarron of the Lexington Conservation Commission about this possibility.

MESA Status

The four sites described above are permanent conservation areas managed by municipal conservation commissions. However, all areas are subject to multiple uses. If we are granted permission by MNHESP to introduce *L. scariosa* var. *novae-angliae* as planned at the sites described in this proposal, we suggest that these sites NOT be mapped as Priority Habitat for New England blazing star, since these are, in essence, experimental reintroductions.

References Cited:

Kane, Aileen and Johanna Schmitt. 2001. New England Plant Conservation Program Conservation and Research Plan: *Liatris borealis* Nuttall ex MacNab (Northern Blazing Star). Unpublished report for the New England Wildflower Society. 39pp.

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Eaton, Richard. 1974. A Flora of Concord : an account of the flowering plants, ferns, and fern-allies known to have occurred without cultivation in Concord, Massachusetts from Thoreau's time to the present day. Special publication - Harvard Museum of Comparative Zoology; no. 4.