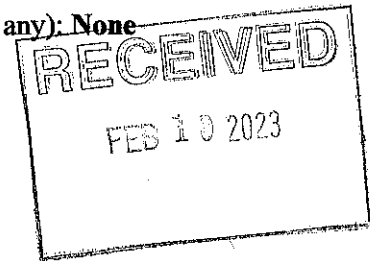


Species Listing PROPOSAL Form:
Listing Endangered, Threatened, and Special Concern Species in Massachusetts

Scientific name: *Lythrum alatum*
 Common name: **Winged Loosestrife**

Current Listed Status (if any): **None**



Proposed Action:

Add the species, with the status of: **Endangered**

Proponent's Name and Address:

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Association, Institution or Business represented by proponent: **n/a**

Proponent's Signature:

Date Submitted: February 8, 2023

Please submit to: Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries & Wildlife, 1 Rabbit Hill Road, Westborough, MA 01581

Justification

Justify the proposed change in legal status of the species by addressing each of the criteria below, as listed in the Massachusetts Endangered Species Act (MGL c. 131A) and its implementing regulations (321 CMR 10.00), and provide literature citations or other documentation wherever possible. Expand onto additional pages as needed but make sure you address all of the questions below. The burden of proof is on the proponent for a listing, delisting, or status change.

(1) **Taxonomic status.** Is the species a valid taxonomic entity? Please cite scientific literature.
Yes. *Lythrum alatum* Pursh (POWO, 2023).

(2) **Recentness of records.** How recently has the species been conclusively documented within Massachusetts?
It was documented in 2022.

(3) **Native species status.** Is the species indigenous to Massachusetts?
Yes. It was collected in Massachusetts at least as early as 1866. Note that Seymour (1985) and Weatherbee (1996) described the species as "from further west or south" and "adventive from farther west," respectively. However, more recent publications describe it as native to parts of Massachusetts (Magee and Ahles, 1999; Cullina et al. 2011; Haines, 2011).

(4) **Habitat in Massachusetts.** Is a population of the species supported by habitat within the state of Massachusetts?
Yes. Currently, there are two populations documented as extant in Massachusetts in 2022.

(5) **Federal Endangered Species Act status.** Is the species listed under the federal Endangered Species Act? If so, what is its federal status (Endangered or Threatened)
***Lythrum alatum* is not listed under the Federal Endangered Species Act.**

(6) Rarity and geographic distribution.

(a) Does the species have a small number of occurrences (populations) and/or small size of populations in the state? Are there potentially undocumented occurrences in the state, and if so, is it possible to estimate the potential number of undocumented occurrences?

Currently, there are two extant populations in Massachusetts, both in Berkshire County. The Williamstown population is apparently decreasing; 75 plants were observed in 2014, but only 20 in 2022. The Sheffield population is robust, with over 150 plants observed in 2022. While efforts were made to search historical and de novo sites for this species, without success, there may be other as-yet-undiscovered sites, perhaps as many as two or three.

(b) What is the extent of the species' entire geographic range, and where within this range are Massachusetts populations (center or edge of range, or peripherally isolated)? Is the species a state or regional endemic? **The species ranges from Maine and southern Ontario to Florida, and west to North Dakota, Wyoming, Colorado, and Texas. Massachusetts is on the eastern edge of the range. The species is not a state or regional endemic. However, *Lythrum alatum* is considered a species of regional concern in New England (Division 2 in *Flora Conservanda*, Brumback and Gerke, 2013). In New England and New York, *Lythrum alatum* is ranked as S1 in Connecticut and Vermont, S1? in Massachusetts, SNA in Rhode Island, SU in Maine, and SNR in New Hampshire and New York (NatureServe Explorer, accessed 19 January 2023).**

(7) Trends.

(c) Is the species decreasing (or increasing) in state distribution, number of occurrences, and/or population size? What is the reproductive status of populations? Is reproductive capacity naturally low? Has any long-term trend in these factors been documented?

From the 1860s to the 1980s, specimens were collected from at least 12 municipalities in at least 6 counties (Berkshire, Franklin, Worcester, Middlesex, Norfolk, Suffolk). Now there are only two known occurrences, both in Berkshire County.

Both extant populations flower annually and appear to set seed, although the viability of the seed is apparently unknown. In general, the reproductive capacity of this species is not low.

(8) Threats and vulnerability.

(d) What factors are driving a decreasing trend, or threatening reproductive status in the state? Please identify and describe any of the following threats, if present: habitat loss or degradation; predators, parasites, or competitors; species-targeted taking of individual organisms or disruption of breeding activity.

The factors affecting Winged Loosestrife's precarious status in Massachusetts are not definitively documented. Possible contributors include changes in agricultural practices (overall decrease in fields; more intense mowing on existing fields), succession of open meadows to woodlands or closed-canopy forests, constraints on beaver dispersal, and anthropogenic drainage of open wet habitats.

(e) Does the species have highly specialized habitat, resource needs, or other ecological requirements? Is dispersal ability poor?

***Lythrum alatum* appears to require open, damp-to-wet meadows. Such habitats are currently scarce in Massachusetts because of intense agricultural mowing, drainage for agriculture, constraints on beaver dispersal, and succession to woody communities. Its dispersal ability is not known to be poor.**

Conservation goals.

What specific conservation goals should be met in order to change the conservation status or to remove the species from the state list? Please address goals for any or all of the following:

(a) State distribution, number of occurrences (populations), population levels, and/or reproductive rates
To secure the status of *Lythrum alatum* in Massachusetts to the point where it could be removed from the state list will likely require a minimum of 20 extant populations distributed over at least the four western counties, with each population having at least 50 reproductive individuals documented from at least three years in a ten-year period. Note that this standard will probably require introductions or re-introductions of the species to appropriate habitats on appropriately conserved and managed properties.

(b) Amount of protected habitat and/or number of protected occurrences
The minimum 20 populations noted above should all be located on appropriately conserved properties, with a minimum of 5 acres of appropriate habitat conserved at each site.

(c) Management of protected habitat and/or occurrences
Appropriate management of habitat for *Lythrum alatum* includes maintenance of open, damp meadows, with occasional mowing (or possibly prescribed fire) and removal of exotic invasives and strongly spreading, colonial natives such as *Solidago* spp.

Literature cited, additional documentation, and comments.

De novo searches

During 2022, de novo searches for additional populations of *Lythrum alatum* were carried out by this proposal's author at three sites with appropriate habitat, sometimes with the assistance of Anthony Gola:

- 9 July 2022 – Stafford Hill Wildlife Management Area, Cheshire, MA, fen and damp meadow
- 27 July 2022 – Carey Corner fen, Lenox Road, Richmond, MA, fen and damp meadow
- 27 July 2022 – Fairfield Brook Wildlife Management Area, off East Road, Richmond, MA, damp meadow
- 12 August 2022 – powerline corridor between Route 20 (South St.) and Holmes Road

No new populations of *L. alatum* were discovered.

Galerucella* effects on *Lythrum alatum

Galerucella beetles were introduced to North America over three decades ago as a means of controlling the non-native invasive Purple Loosestrife, *Lythrum salicaria*. One study (Kotavich et al. 2008) documented a decrease in seed capsules of *L. alatum* in one year of a two-year study as a result of *Galerucella* beetle herbivory. Correspondence in the Massachusetts Natural Heritage files indicates that William Moorhead may have seen *Galerucella* beetles on at least one of the three extant *Lythrum alatum* populations in Connecticut (emails between Moorhead and Melissa Dow Cullina, 9 August 2007).

While this listing proposal's author did not note beetle damage on any *L. alatum* surveyed in 2021 or 2022, the possibility remains that *Galerucella* species may have a detrimental effect on *L. alatum*. Both of the two Massachusetts populations currently extant have small numbers of *L. salicaria* plants near the *L. alatum*, despite the landowners' best efforts to control the *L. salicaria*.

Literature Cited

Brumback, W.E., and J. Gerke. 2013. Flora Conservanda: New England 2012. The New England Plant Conservation Program (NEPCoP) List of Plants in Need of Conservation. *Rhodora* 115 (964), 313-408.

Cullina, M.D., B. Connolly, B. Sorrie, and P. Somers. 2011. *The Vascular Plants of Massachusetts: A County Checklist*. First revision. Massachusetts Natural Heritage & Endangered Species Program, Massachusetts Division of Fisheries and Wildlife, Westborough, MA.

Haines, A. 2011. *Flora Novae Angliae: A Manual for the Identification of Native and Naturalized Higher Vascular Plants of New England*. Yale University Press, New Haven, CT.

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Magace, D.W., and H.E. Ahles. 1999. *Flora of the Northeast: A Manual of the Vascular Flora of New England and Adjacent New York*. University of Massachusetts Press, Amherst, MA.

POWO. 2023. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://www.plantsoftheworldonline.org/> Retrieved 08 February 2023.

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Weatherbee, P.B. 1996. *Flora of Berkshire County, Massachusetts*. The Berkshire Museum, Pittsfield, MA.