***Mycelis muralis* (L.) Dumort - Wall lettuce**

Synonyms: *Lactuca muralis* (L.) Gaertner (USDA); *Prenanthes muralis* Linnaeus

Taxonomy

Family: Asteraceae (NWCB)

Figure 1. Wall lettuce. Credit:Robert Vidéki, Doronicum Kft., Bugwood.org.

Wall lettuce is an annual or biennial herbaceous plant with purple tinged branched stems 2-3 feet tall. When broken, the stems exude a milky juice. Leaves are alternate and mid-green; basal leaves are deeply lobed and wide, while upper stem leaves are smaller. The foliage turns yellow in the autumn. Flowers consist of five yellow florets arranged in a loose panicle with stalks roughly perpendicular from the stem. Plants flower in mid-late summer. (Eddmaps; Hortipedia).

There are no known cultivars, however, *M. muralis* was cross pollinated with *Lactuca tatarica* and *L. canadensis* L. in the US and it failed. *M. muralis* is suggested to be autogamous and there is no data suggesting it can form viable hybrids.

Native Region or Range

This species is native to Europe including temperate central and southern continental Europe and is found as far north as Norway (c. 68.5 degrees N) (Clabby & Osborne, 1999). It occurs sparsely across the western Iberian Peninsula, Scandinavia, Russia, but present in Turkey, North Africa, and the Caucasus.

History
The earliest record of *Mycelis muralis* in Massachusetts is 1984, when Mehrhoff discovered plentiful yellow flowers at the edge of woods and in a parking lot in Lincoln, Berkshire County (Herbarium). Weatherbee later found this species flowering by a road edge in Pittsfield (Berkshire County) in 1990. Sorrie and Somers (1999) reported the species occurring only in both Berkshire and Middlesex Counties. In nearby states, F. Koch had found the species in Brattleboro, VT in 1979 (NEBC Herbarium). Mehrhoff found several other specimens including a found a flowering plant in Windsor County, Vermont, in 2002 and a flowering plant in Sullivan County, New Hampshire in 2004. In 2004 and 2005, Mehrhoff discovered more scattered *Mycelis muralis* individuals in Tompkins and Warren Counties in New York (UConn Herbarium). (It was originally observed in 1951 in Tompkins by D. E. Fairbrothers; specimen at Rutgers University: CHRB). By 2007, Petschelt found scattered plants in Manchester-by-the-Sea in Essex County in both roadside and beach habitats (EDDMapS).

Biology
Life form: herbaceous annual biennial depending on habitat (invasive plant atlas)

- Perennial hemicryptophyte (Clabby & Osborne, 1999)
- 3-8 basal leaves, lyrate-pinnatifid and in a rosette
- Leafy, glabrous stem with lobed, glabrous leaves
- Undersides of leaves sometimes red crimson
- Flowers yellow and in a branched panicle

Naturalized: Yes

Dispersal:

- Hermaphroditic florets
- It is suggested that it is autogamous
- Self-fertilization eliminates the need for pollinators
- A highly branched panicle with many capitula, with five florets per capitulum and up to six branching orders
- # capitula per plant: In a shaded woodland site: 98 plus or minus 38 SD, and in an open site 765 plus or minus 254 SD per plant. SD=?
- Mean # pollen grains per capitulum: 4325
- Maximum of 5 ripe achenes per capitulum after fertilization
- Flowers have pappus, which helps in wind dispersal
- Long flowering season (iNaturalist records in MA show flowering from late May through early November).
- Shaded sites: plant can produce up to 500 seeds
- Open sites: plant can produce up to 11,500 seeds
- Achenes germinate readily or overwinter and germinate the following spring
- Limited data suggests that *M. muralis* seeds do not persist in the seed bank for long periods of time

M. muralis has hermaphroditic florets eliminating the need for pollinators. The panicle is highly branched, reaching up to six branching orders with many capitula and approximately five florets per capitulum. They have a long flowering season and flowers with pappus, which aid in dispersal.

Habitats:

- Shaded woodlands, fragmented woodlands & wood margins, rock walls
- Sometimes occurring in open habitats including limestone pavement in Ireland and Britain
- In continental Europe, *M. muralis* grows in base-rich, calcareous rendzina soils and sometimes skeletal substrate such as limestone. It can be associated with beech.

Reference: Clabby & Osborne 1999

Biological Potential: It tolerates a wide range of soil conditions and habitats from woods to stream valleys so can be considered a threat to a wide range of woodland and streamside habitats. It tolerates shade. Given that it is wind dispersed with high seed numbers (up to 11,000 seeds per plant in full sun), there is potential for rapid spread.

Reported Invasiveness:

It is not included on any national lists or laws. It is listed in the invasive species state law of New Hampshire and on the state list of Alaska.

- Vermont: *M. muralis* is on the VT invasive plant watchlist
- New Hampshire: *M. muralis* is on the NH invasive plant watchlist
- Maine: Lists *M. muralis* with a ranking of 6- insufficient data to evaluate- but it is localized in ME on a ranking system of 1 through 6, 1 being severely invasive and 6 being insufficient data to evaluate (Maine Natural Areas Advisory List of Invasive Plants, 2019)
- Alaska: The state of Alaska ranks *M. muralis* a 31 of 100. (University of Alaska)

Distribution

It has been reported from 12 states and British Columbia (Figure 2) (EDDmapS 2022).

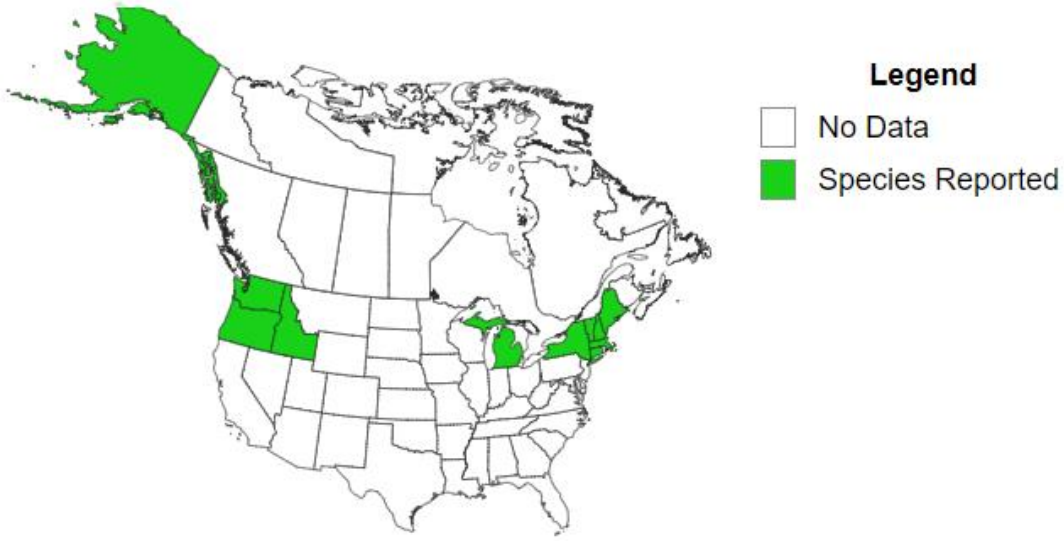

Figure 2. Introduced range of *M. muralis* in the U.S. (EDDMapS 2022).

In MA this species is known from two counties.

MA counties:

Berkshire	Middlesex		

As of August 2022, there were:

- 7 confirmed records in EDDmapS
- 85 confirmed records in iNaturalist (reviewed by Karro Frost) found across the state. See Figure 3. Observations have been reported in 7 counties, including Berkshire, Middlesex, Franklin, Hampden, Worcester, Essex, and Barnstable.

Spread and Impacts:

Native habitat: There is no evidence that proves that *M. muralis* has highly competitive ability in its native natural habitat. *M. muralis* rarely occurs in a closed sward and more often occurs as a component of sparse vegetation cover when in high light environments (Clabby & Osborne, 1999). It generally stays confined to fragmented habitats in its native range. . In more open habitats it stays confined to limestone pavement or stone walls. In closed woodland floor habitats, it may compete with co-occurring species. *M. muralis* is found in sparse vegetation when in shaded locations. *M. muralis* is an early successional species and the percent cover generally remains low. *M. muralis* usually remains in small groups or individuals remain scattered and don't form large patches. The percent cover often remains less than 10% of 100-cm² subsections of a 1-M² quadrat, however, *M. muralis* has infrequently been found in up to 40% of 100 cm² subsections of a 1-M² quadrat in woodland habitats.

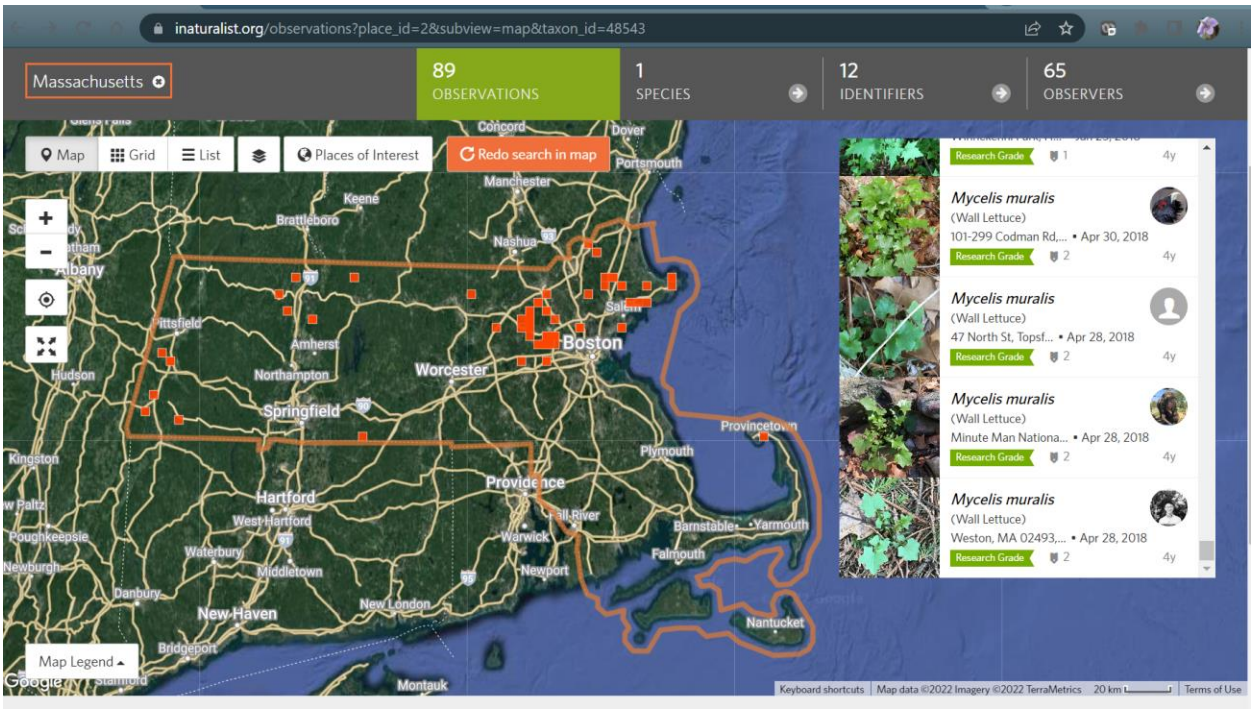

Figure 3. Records of *M. muralis* in Massachusetts (iNaturalist 8-3-2022).

Introduced habitat:
Stacy Carter, from the Town of Lincoln, MA described the population there for MIPAG:

> "In Lincoln, *Mycelis muralis* appears to favor pine or hemlock-dominated forests with sparse undergrowth but has also been found frequently in areas of disturbance (roadsides, pipelines ROWs). *Mycelis muralis* seems to grow well in both dry upland soils and wetland edges and seems to be most competitive in shaded habitats. There are several major populations of *Mycelis muralis* in the Town of Lincoln, but the plant has also been found dispersed across town. Resident and Lincoln Land Conservation Trust staff member Jane Layton has recorded it in twenty different roadside and conservation locations.
>
> - One population is established on the Tennessee Gas Pipeline through the eastern side of the Flint's Pond conservation area. The population is dispersed over about two acres of land and appears to be growing intermixed with various native and non-native species. It is not clear whether this population is outcompeting neighboring plants here or not. This population has been heavily managed in the past by Conservation staff, but the size of the population does not appear to have decreased.
> - Another large population is found in Lincoln's Pierce Park, a municipal parcel that is mostly pine forest with very little undergrowth, likely due in part to intense deer pressure. The *Mycelis muralis* population here appears to be about 1.5 acres and spreading. Due to the lack of other undergrowth, *Mycelis muralis* has formed a near monoculture in the area. This population has not been managed due to its size and lack of other plants in the area.
> - The third large population of *Mycelis muralis* is found off of Tower Road east of the Umbrello Fields (southeast corner of Lincoln). This population is spread over approximately 1 acre and is growing intermixed with other native and non-native species. Again, it is unclear whether *Mycelis muralis* is outcompeting neighboring plants here or

simply filling in the gaps in a sparse pine forest understory. This population has been heavily managed in the past and appears to be less dense than it was several years ago.

In the past, Lincoln Conservation Department staff had been very concerned about *Mycelis muralis* and have done a lot of work to control it. The most effective means of management appears to be similar to that of garlic mustard. Staff hand-pull *Mycelis muralis* in late May or early June when it begins flowering. *Mycelis muralis* has been seen producing flowers and seeds from mid-May to the end of October. Conservation Department staff do not bag and remove *Mycelis muralis* from the area, but instead take care to ensure that the roots of the pulled plants are not touching the ground (*Mycelis muralis* has been found to regrow frequently in these cases). Staff have left *Mycelis muralis* hanging in trees, on rock walls, on pavement, etc. Since regrowth of pulled plants had been seen so frequently, some Lincoln Land Conservation Trust staff prefer to snap the pulled *Mycelis muralis* into several smaller pieces to help prevent any further growth.

In recent years, Conservation Department staff have not spent as much time on *Mycelis muralis* management because we have preferred to focus on known invasives like black swallowwort. Though *Mycelis muralis* is certainly prolific in certain areas, staff are not sure if *Mycelis muralis* is outcompeting our native plants, or if it is instead growing in the spaces between them as it seems to prefer pine forests where we have very little undergrowth otherwise. This does suggest that deer do not prefer it as forage. Lincoln Land Conservation Trust staff still control *Mycelis muralis* regularly and note that it appears to be continuing to spread."

In NH, it has been found in upland and wetland habitats. At Hobbs Sanctuary in Lyman, NH, it has been found in a relatively undisturbed rich mesic forest and an intact balsam fir-northern white cedar swamp (30-40 plants appeared the first time it was seen) (Figure 4). In addition, also at Hobbs, it may be outcompeting spring ephemeral plants and has potential to further outcompete them if left unmanaged. At Plainfield Sanctuary, it has been found growing in mossy seepy areas next to a waterfall within a steep hemlock-northern hardwood forest. It may be competing with other native herbaceous plants in this habitat.

In VT, at Eshqua Bog, wall lettuce has been invading the edge of a rich fen for at least 10 years now. The population spread from a rich northern hardwood forested slope into the fen and may have originated from fill related to a house at the top of a nearby slope (Figure 5). This species would have outcompeted orchids and other plant species on the edge of the fen if unmanaged. Fortunately, this population has been managed for ten years.

Finally, this species was recently found in Woolwich, Maine at Native Plant Trust's Coffin Sanctuary in August 2021, indicating that the species may be spreading in New England (F. Sechler, Observ. 2021).

Figure 4. *Mycelis muralis* in a minimally managed habitat in a rich mesic forest (S3) at Hobbs Sanctuary, Lyman, NH (Photo by Bruce Patterson).

Figure 5. *M. muralis* in a minimally managed habitat in a rich northern hardwood forest at Eshqua Bog, Hartland, VT (Photo by Bruce Patterson).

References

Clabby, G. and B.A. Osborne. 1999. Biological flora of the British Isles. Mycelis muralis (L.) Dumort. (Lactuca muralis (L.) Gaertner. Journal of Ecology 87: 156-172.

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Herbarium specimen data provided by: George Safford Torrey Herbarium (CONN), University of Connecticut; New England Botanical Club Herbarium (NEBC) Harvard University (Accessed through the Consortium of Northeastern Herbaria web site, www.neherbaria.org, 2022-08-03)

Information compiled by Ava Sigmund (The Nature Conservancy) and with additions by Frederick Sechler (Native Plant Trust) and Karro Frost (Natural Heritage & Endangered Species Program) 2022.

SPECIES: ***Mycelis Muralis (L.) Dumort***

STATUS : LIKELY INVASIVE

NON-NATIVE INVASIVE PLANT WORKSHEET

MASSACHUSETTS CRITERIA FOR EVALUATING NON-NATIVE PLANT SPECIES FOR INVASIVENESS

The Massachusetts Invasive Plant Advisory Group (MIPAG) defines invasive plants as "*non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems.*" As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species unless proven otherwise by a process of scientific evaluation.

The following criteria are being used to objectively evaluate and categorize plant species suspected of being, or with the potential to become, invasive in Massachusetts. They were developed by the George Safford Torrey Herbarium at the University of Connecticut and a subcommittee of the Massachusetts Invasive Plant Group representing science, nursery, and conservation professionals.

The criteria enable the separation of plants into the following categories:

- Invasive Plants in Massachusetts
- Likely Invasive Plants in Massachusetts
- Potentially Invasive Plants in Massachusetts (species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within the Commonwealth)

For a species to be included on the list of species determined to be **Invasive, Likely Invasive or Potentially Invasive** in Massachusetts, it must be substantiated by scientific investigation (including herbarium specimens, peer-reviewed papers, published records and other data available for public review) to meet specific criteria. The process of reviewing individual plant species for their invasiveness in Massachusetts is ongoing and may result in a change in status pending new data and further review.

Tabular summary of criteria to be met

	Criteria that must be met
Base criteria	1-4
Invasive	1-9
Likely Invasive	1-5, at least one of 6-9, at least one of 10-12
Potentially Invasive	1-4 (not 5), 13-15

Species: Mycelis muralis (L.) Dumort

For a species to be designated as "INVASIVE," "LIKELY INVASIVE" or "POTENTIALLY INVASIVE" it must meet certain base criteria (#1-4 below). The species must:

1. Be nonindigenous to Massachusetts.

Yes *No*

Comment: This plant is native to temperate central and southern continental Europe, Turkey, North Africa, and the Caucasus (Clabby & Osborne, 1999).

2. Have the biologic potential for rapid dispersion and establishment in minimally managed habitats

Yes *No*

Comment: M. muralis can produce up to 500 seeds in shaded sites and up to 11,500 seeds in open sites (Clabby & Osborne 1999). In its native range M. muralis thrives in both open habitats including fragmented woodlands, woodland edges and shaded habitats.

3. Have the biologic potential for dispersing over spatial gaps away from the site of introduction.

Yes *No*

Comment: Yes, M. muralis seeds have pappus, which aid in wind dispersal and potentially dispersing seeds over spatial gaps (Clabby & Osborne, 1999).

4. Have the biologic potential for existing in high numbers away from intensively managed artificial habitats

Yes *No*

Comment: Due to its efficient reproduction and ability to disperse over spatial gaps M. muralis has the potential to exist in high numbers away from artificial habitats. It has been found on conservation land in Lincoln, MA (SUASCO CISMA 2013). It has also been managed in large numbers over the past ten years on wetland edges and a rich hardwood forested slope at Eshqua Bog in Hartland, VT, and has increased in numbers in an undisturbed intact northern hardwood forest and an intact northern white cedar – balsam fir swamp in northern NH.

If a species does not meet all four of the previous criteria, stop here. The species cannot be listed at this time. If a species meets all four, go on to #5.

5. Be naturalized in Massachusetts (persists without cultivation in Massachusetts)

Yes *No*

Comment: There are seven positive reports of M. muralis in Massachusetts, all of which are away from artificial habitats. According to the Lincoln Conservation Organization, a population covering a 6-acre area was found in a mixed hardwood forest with a distribution of approximately 40% covering the total area. (SuAsCo CISMA, 2013). There are a total of four other populations recorded in EDDmapS on Lincoln Conservation land. One of which was a population covering approximately 10 acres with a percent cover of 76-100%. Another population recorded on the same land covered approximately 1 acre. There were more than 1000 individuals in each of these populations. The other three records don't list population or distribution data, however, they are verified reports of positive infestations of M. muralis.

If a species meets Criteria 1-4 and Criterion 5, it may be considered "INVASIVE" or "LIKELY INVASIVE" in Massachusetts. Go to Criteria 6-9.

If it does not meet Criteria 5, it may be considered "POTENTIALLY INVASIVE" if it meets Criteria 13-15.

6. Be widespread in Massachusetts, or common in a region or habitat type(s) in the state.

Yes *No*

Comment: This species is reported in three counties in Massachusetts. Of the seven sightings, five are in Middlesex County and these are all located within Lincoln. It is also found in Franklin County according to the Franklin County flora (found in 10 out of 26 towns) and Berkshire County (two occurrences in EDDMapS).

7. Have many occurrences in MA that have high numbers of individuals in minimally managed habitats.

Yes *No*

Comment: There are only a few reported occurrences, however, those occurrences report numerous individuals.

8. Be able to out-compete other species in the same natural plant community.

Yes ***No***

Comment: It is unclear at this time in MA whether it is outcompeting other species. Stacy Carter, the Conservation Planner at the Lincoln Conservation Department, noted that the Lincoln Conservation Department made efforts to pull this plant in the past, but stopped in recent years because although wall lettuce is prolific in certain areas, they aren't sure that it is outcompeting our native plants. Instead, it may be growing in the spaces between them. She also noted that M. muralis seems to prefer pine forests where there is very little undergrowth otherwise. In NH and ME it has been found in mature habitats.

In NH, it has been found in upland and wetland habitats. At Hobbs Sanctuary in Lyman, NH, it has been found in a relatively undisturbed rich mesic forest and an intact balsam fir-northern white cedar swamp. In addition, also at Hobbs, it may be outcompeting spring ephemeral plants and has potential to further outcompete them if left unmanaged.

At Plainfield Sanctuary, it has been found growing in mossy seepy areas next to a waterfall within a steep hemlock-northern hardwood forest. In 2022, a new population of this species was found at Plainfield, which is evidence that the species has spread in open natural disturbances within the steep hemlock-northern hardwood forest.

In VT, at Eshqua Bog, wall lettuce has been invading the edge of a rich fen for at least 10 years now. The population spread from a rich northern hardwood forested slope into the fen and may have originated from fill related to a house at the top of a nearby slope. This species would have outcompeted orchids and other plant species on the edge of the fen if unmanaged. Fortunately, this population has been managed for ten years.

Finally, this species was recently found in Woolwich, Maine in August 2021, indicating that the species may be spreading in New England.

9. Have the potential for rapid growth, high seed or propagule production and dissemination, and establishment in natural plant communities.

Yes *No*

Comment: M. muralis can produce up to 500 seeds in shaded sites and up to 11,500 seeds in open sites (Clabby & Osborne, 1999). The panicle is highly branched, reaching up to six branching orders with many capitula and approximately five florets per capitulum. The species has a long flowering season and flowers have pappus, which aids in dispersal. M. muralis thrives in both open habitats including fragmented woodlands and woodland edges and shaded habitats. It has also been found in wetlands and especially wetland edges and habitats associated with moist outcrops.

If a species meets the initial five Criteria and Criteria 6-9 it may be considered an "INVASIVE" species in Massachusetts.

If a species meets the initial five Criteria, but does not meet all of Criteria 6-9 at this time, it may be considered a "LIKELY INVASIVE" species in Massachusetts if in addition it meets at least one of the following three Criteria (#10-12).

10. Have at least one occurrence in Massachusetts that has high numbers of individuals forming dense stands in minimally managed habitats.

Yes *No*

Comment: Yes, in Lincoln, MA a population spanning 10 acres was reported on private conservation land, with a 76-100% cover. (EDDmapS).

11. Have the potential, based on its biology, colonization history outside its native range, and likelihood of range expansion or change in biologic potential from climate change predictions, to become invasive in Massachusetts.

Yes *No*

Comment: M. muralis can produce up to 500 seeds in shaded sites and up to 11,500 seeds in open sites. M. muralis thrives in both open habitats including fragmented woodlands and woodland edges and shaded habitats.

In Vermont, this species disperses very easily and widely with airborne seeds, even to places more than a mile from roads or disturbances. This species can be in the seedbank (germinates abundantly in closed canopy forests around new blow downs). Control efforts don't seem to be all that successful at limiting spread. At this point, wall lettuce is likely in all 251 towns in Vermont (as of the last 5 years), so there is nothing early- detection about this anymore (A. Marcus, pers. comm, 2022).

In Lyman, NH, the species has apparently recently spread very quickly within a mostly undisturbed northern white cedar – balsam fir swamp (S2 in NH). M. muralis was not detected in this swamp in 2019-2020, but in August 2021 about 200 individual plants were present. This swamp is about 200-250 meters from the only other known occurrences of M. muralis at Hobbs Sanctuary in a rich northern hardwood forest. Native Plant Trust staff and volunteers hand-pulled the individual plants in August 2021, but it is likely that the plants dispersed seed before management efforts. A follow-up management effort will be conducted in 2022.

In addition, due mainly to annual hand-pulling management efforts, M. muralis continues to be in relatively small numbers in a rich northern hardwood forest. Without annual management, this species would likely occur in large numbers and potentially outcompete native spring ephemeral plant species in this habitat.

12. Be acknowledged to be invasive in nearby states but its status in Massachusetts is unknown or unclear. This may result from lack of field experience with the species or from difficulty in species determination or taxonomy.

Yes ***No***

Comment: M. muralis is not listed as invasive in any state in the United States. In Vermont, New Hampshire, and Maine it is on the invasive species watchlists but not yet declared as invasive. M. muralis is localized in Maine, however, it is listed with a ranking of 6 on a ranking system of 1 through 6 with 1 being severely invasive and 6 meaning there is insufficient data to evaluate (Advisory List of Invasive Plants, 2019). The state of Alaska rates the species a 31 out of 100 on their weed risk assessment form (University of Alaska).

Species: Mycelis muralis (L.) Dumort

If the species meets the basic criteria for invasiveness (Criteria 1-4) but is not naturalized in Massachusetts (Criterion 5), the species may be considered "POTENTIALLY INVASIVE" in Massachusetts if it meets the following three criteria (#13-15):

13. The species, if it becomes naturalized in Massachusetts, based on its biology and biologic potential, would pose an imminent threat to the biodiversity of Massachusetts **and**

Yes No (note: include reference(s) and comments)

14. Its naturalization in Massachusetts is anticipated, **and**

Yes No (note: include reference(s) and comments)

15. The species has a documented history of invasiveness in other areas outside its native range including expansion of range and/or change in biological potential from climate change predictions.

Yes No (note: include reference(s) and comments)

COMMENTS:

Recent reports from adjacent states to MA has provided increasing evidence that *M. muralis* can disperse very easily and widely with airborne seeds in minimally managed habitats. Without management, it will likely outcompete native wetland flora and spring ephemerals. It has also, according to observational reports, likely increased in areas of Vermont and New Hampshire. *M. muralis* is unlike most invasive plants in that it may be spreading from north to south and west to east. Therefore, *M. muralis* does pose a threat to minimally managed habitats in Massachusetts, especially in the central and western portions of the state. Efforts should be made to control populations of *M. muralis* in MA before the species spreads further. It is recommended that this species be listed as "Likely invasive" due to the evidence of the species' ability to disperse very easily and widely with airborne seeds in minimally managed habitats in NH and VT. Currently, it is not included on any national lists or laws. It is only recorded in the invasive species state law of New Hampshire and on the state list of Alaska, and on the watchlist in Maine and Vermont. However, Vermont has not recently updated their list of invasive plants to be prohibited by state law, and if the list was updated, *M. muralis* would likely make the list (Marcus, 2022).

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Clabby, G. and B.A. Osborne. 1999. Biological flora of the British Isles. Mycelis muralis (L.) Dumort. (Lactuca muralis (L.) Gaertner. Journal of Ecology 87: 156-172.

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Species: Mycelis muralis (L.) Dumort

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Marcus, A. 2021-2022. Personal communication re: *Mycelis muralis* in VT.

Sechler, F. C. 2021. *Mycelis muralis* at Hobbs Sanctuary, Plainfield Sanctuary in NH, Eshqua Bog in VT, and Coffin Sanctuary in Woolwich, ME.

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Initial evaluation completed:
Ava Sigmund, The Nature Conservancy.

Voted as **Likely Invasive** by MIPAG, 12-12-22*

**This evaluation used updated evaluation criteria voted on by MIPAG at the September 8, 2022 meeting.*

DEFINITIONS TO ACCOMPANY "CRITERIA FOR EVALUATING NON-NATIVE PLANT SPECIES FOR INVASIVENESS IN MASSACHUSETTS"*

Biologic potential - The ability of a species to increase its number, either sexually and/or asexually.

Invasive plants - Non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations and becoming dominant and/or disruptive to those systems. *As defined here, "species" includes all synonyms, subspecies, varieties, forms, and cultivars of that species unless proven otherwise by a process of scientific evaluation.*

Indigenous species - otherwise A species that occurs natively in Massachusetts. Indigenous species often have a pre-colonial presence (pre-1500) or have arrived in the region more recently without the aid of human intervention. Synonymous with native species.

Intensively managed habitats - Intensively managed habitats are habitats or land systems where management efforts and investments of time, money and labor occur frequently Examples include manicured lawns, landscaped grounds, gardens, roadsides or agricultural lands for crops or livestock.

Species: Mycelis muralis (L.) Dumort

Likely Invasive plants - non-native species that are naturalized in Massachusetts but meets some, but not all (replaced: do not meet) the full criteria that would trigger an "Invasive plant" designation.

Minimally managed habitats - Minimally managed habitats are habitats where management efforts and investments of time, money and labor are infrequent or non-existent. These habitats may have been intensively managed for anthropogenic reasons at one time in their history. In some instances, management may be more intense, but management is done for conservation purposes and is primarily aimed at preserving elements of biological diversity such as imperiled species or critical natural communities. Minimally managed habitats are similar to "natural areas" but the distinction is made in order to remove bias, misconceptions or ambiguities that surround the term "natural area".

Non-indigenous species - A species that is not native or naturally occurring (based on its biology, phylogeny, distribution and current knowledge about the species) within Massachusetts. A species may be indigenous to North American but non-indigenous in Massachusetts. Synonymous with non-ntaive species.

Naturalized species - A non-indigenous taxon that occurs without the aid and benefits of cultivation in Massachusetts. Further, it implies two biological points: it freely and regularly reproduces in the wild, sexually or asexually, and occurrences persist over time.

Natural plant community - A natural plant community is an association or assemblage of plant species that repeatedly occur together in reoccurring patterns in a specific type of habitat. This assemblage can be characterized by dominant species and biological properties. A natural plant community implies a minimally managed situation where all or most of the species that make up the assemblage are indigenous to the defined area.

Occurrence - Existing example of a species on the landscape.

Potentially invasive plants - Non-native species not currently known to be naturalized in Massachusetts, but that can be expected to become invasive within minimally managed habitats within the Commonwealth.

Spatial gaps - This term is used in reference to the ability of a species to disperse away from existing occurrences. The concept of crossing spatial gaps is used to distinguish those species that can disperse over discontinuities and become established elsewhere from species that spread across a habitat only by continual, uninterrupted growth.

**Please note that there are no definitions for certain terms (e.g. widespread or high numbers) as the intent is that discussion within MIPAG will be used to determine the outcome given that we do not have perfect information.*