

Lysimachia nummularia

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INTRODUCTORY

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Moneywort in Jardin Botanique Roger-Van den Hende,
Quebec City, Quebec. Photo courtesy of Louis-M.
Landry

AUTHORSHIP AND CITATION:

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FEIS ABBREVIATION:

LYSNUM

NRCS PLANT CODE [[107](#)]:

LYNU

COMMON NAMES:

moneywort

creeping jenny

TAXONOMY:

The scientific name of moneywort is *Lysimachia nummularia* L. (Primulaceae) [[29,31,40,59,60,66,77,78,87,97](#)].

Intentional crosses of moneywort with 7 yellow loosestrife (*Lysimachia* spp.) species native to the United States failed [[17](#)], and no natural hybrids were known as of this writing (2011). Moneywort is a popular ground cover in gardens and lawns, and cultivars have been developed [[36](#)].

SYNONYMS:

None

LIFE FORM:

Vine-forb

DISTRIBUTION AND OCCURRENCE

SPECIES: *Lysimachia nummularia*

- [GENERAL DISTRIBUTION](#)
- [HABITAT TYPES AND PLANT COMMUNITIES](#)

GENERAL DISTRIBUTION:

Moneywort is nonnative in North America, where it has a wide but discontinuous distribution. It occurs throughout the eastern United States east of the Mississippi River from Minnesota south to Louisiana, east to Georgia, and north to Maine. It occurs throughout southern Ontario, southern Quebec, and the Canadian Maritime provinces. It is also found in Nebraska, Kansas, and Colorado [[105](#)]. It occurs in the Pacific coastal states west of the Cascade Range in Washington and Oregon; in the northern Sierra Nevada in California; and in southwestern British Columbia and Vancouver Island [[37,60,77,87](#)]. Moneywort is more common in the central and eastern United States than in the West [[37](#)]. [Plants Database](#) provides a distributional map of moneywort.

Moneywort is native to Europe and western Asia [[23](#)]. See Bittrich [[7](#)] for a distributional map of moneywort in the species' native range. Moneywort was introduced from its native range to the United States for horticulture and as an ornamental ground cover [[36,57,105](#)]. It was present in the United States as early as 1739 [[115](#)]. It has escaped from cultivation and spread extensively. According to Mack [[56,57](#)], moneywort seeds were sold in the United States as early as 1833, and it was established outside cultivation in the United States by 1900.

HABITAT TYPES AND PLANT COMMUNITIES:

Plant community associations of nonnative species are often difficult to describe accurately because detailed survey information is lacking, there are gaps in understanding of nonnative species' ecological characteristics, and nonnative species may still be expanding their North American range. Therefore, moneywort may occur in plant communities other than those discussed here and listed in the [Fire Regime Table](#).

Moneywort occurs in a variety of habitats and plant communities throughout the United States that are similar to those of its native range (see [Site Characteristics](#)). It occurs primarily in floodplain forests and woodlands; along riverbanks

and shorelines of lakes and ponds; in wet meadows and mesic grasslands; and in seeps, [fens](#), [bogs](#), marshes, and swamps. It also occurs in anthropogenically disturbed areas such as cultivated, fallow, and successional fields, lawns, railroad rights-of-way, roadsides, and ditches (e.g., [[5](#),[29](#),[36](#),[45](#),[55](#),[60](#),[78](#),[85](#),[87](#),[105](#)]).

Riparian floodplain and bottomland forest communities: In the northern and north-central United States, moneywort commonly occurs in forested swamps and in mixed-hardwood riparian floodplain and bottomland forest communities. Along Little Otter Creek, Vermont, moneywort was the 2nd densest forb in a closed-canopy yellow birch-sugar maple-American beech (*Betula alleghaniensis*-*Acer saccharum*-*Fagus grandifolia*) floodplain forest [[42](#)]. In the upper Passaic River basin of northern New Jersey, it was the most common nonnative species in pin oak-silver maple (*Quercus palustris*-*Acer saccharinum*) floodplain forests [[3](#)]. In northwestern Pennsylvania, it was the 4th most common forb in a riparian silver maple-sycamore (*Platanus occidentalis*) forest community [[114](#)]. In south-central Pennsylvania, moneywort was one of the most abundant forbs in the pin oak-red maple/gray's sedge-white avens (*Acer rubrum*/*Carex grayi*-*Geum canadense*) association in bottomland mixed-hardwood forests [[74](#)]. Throughout Massachusetts, moneywort occurred in the silver maple-green ash (*Fraxinus pennsylvanica*)-pin oak forest association in small river floodplain forests [[44](#)]. It occurred in a mid-successional Freeman maple (*Acer rubrum* × *A. saccharinum*) bottomland swamp in western New York [[8](#)]. At Delaware Water Gap National Recreation Area, moneywort occurred in the black cherry (*Prunus serotina*)-yellow-poplar (*Liriodendron tulipifera*)-red maple-white ash (*Fraxinus americana*) bottomland mixed-hardwood forest association and in the sycamore-green ash floodplain forest association [[73](#)]. At Valley Forge National Historical Park in southeastern Pennsylvania, it occurred in the sycamore-green ash association in early-successional riverine floodplain forests [[76](#)]. In Evansburg State Park, southeastern Pennsylvania, it occurred in red maple-mixed shrub palustrine woodlands and in sycamore-boxelder (*Acer negundo*) floodplain forests [[46](#)]. In Vermillion County, Illinois, moneywort occurred in silver maple floodplain forests and in silver maple/buttonbush (*Cephalanthus occidentalis*) swamps [[52](#)].

In the Southeast, moneywort commonly occurs in mixed-hardwood riparian floodplain and bottomland forest communities. On Plummers Island, Maryland, it occurred in a rocky channel in a floodplain dominated by hackberry (*Celtis occidentalis*), slippery elm (*Ulmus rubra*), black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), river birch (*Betula nigra*), boxelder, and pawpaw (*Asimina triloba*) [[90](#)]. In Stewart County, Tennessee, it occurred in bottomland hardwood forests dominated by boxelder, silver maple, river birch, bitternut hickory (*Carya cordiformis*), and green ash [[13](#)]. Along the New River Gorge National River in West Virginia, moneywort occurred in sycamore-river birch forest and black willow-river birch streambeds that were often flooded during high water [[97](#)]. In Fairfax County, Virginia, it occurred in the sycamore-silver maple-river birch-green ash/smallspike false nettle-Emory's sedge (*Boehmeria cylindrica*-*Carex emoryi*) bedrock floodplain woodland community; the sycamore-river birch-willow (black and coastal plain (*Salix caroliniana*) willow) woodland community on coarse-textured depositional bars flooded multiple times each year; and the yellow-poplar-red maple-boxelder-sycamore/American hornbeam-jumpseed (*Carpinus caroliniana*-*Polygonum virginianum*) small-stream floodplain forest community [[93](#)].

Other forest communities: In Evansburg State Park, Pennsylvania, moneywort was dominant in the understory of ash (*Fraxinus* spp.), eastern white pine (*Pinus strobus*), and Norway spruce (*Picea abies*) plantation forests and occurred in eastern redcedar (*Juniperus virginiana*) woodlands [[46](#)]. At the Waterloo Wildlife Research Station, Ohio, moneywort occurred in 7- to 9-year-old clearcuts dominated by pin oak, red maple, yellow-poplar, and bigtooth aspen (*Populus grandidentata*) with an understory of sassafras (*Sassafras albidum*), common greenbriar (*Smilax rotundifolia*), and blackberry (*Rubus* spp.) [[92](#)]. Along the New River Gorge National River, moneywort occurred in Virginia pine (*Pinus virginiana*)-eastern redcedar-post oak (*Quercus stellata*) woodland, a xeric community with exposed sandstone bedrock and an open canopy [[97](#)].

Wetland and shoreline herbaceous communities: In south-central Pennsylvania, moneywort occurred in the bluejoint reedgrass-bullrush-threeway sedge (*Calamagrostis canadensis*-*Scirpus* spp.-*Dulichium arundinaceum*) association in wet meadows where the soil was saturated and under standing water for at least part of the growing season [[74](#)]. In central Pennsylvania, it occurred in the fringed loosestrife-Indianhemp (*Lysimachia ciliata*-*Apocynum cannabinum*) association on low terraces and gravel bars [[75](#)]. Around freshwater springs in southern Illinois, moneywort was common in the fowl mannagrass/Indian woodoats (*Glyceria striata*/*Chasmanthium latifolium*) community along riverbanks and in a gravelly bar [[71](#)]. Along the New River Gorge National River, moneywort

occurred in fringed sedge (*Carex crinita*) wetlands and in American eelgrass-pondweed (*Vallisneria americana*-*Potamogeton* spp.) wetlands [97]. In Great Falls Park, Virginia, it occurred in the lateflowering thoroughwort (*Eupatorium serotinum*)-knotweed (*Polgonum* spp.) community on sandy bars and on riverbanks [93].

A vegetation classification from Illinois described 2 plant communities in which moneywort is a dominant species:

- peppermint (*Mentha piperita*)-twisted sedge (*Carex torta*)-moneywort-jewelweed (*Impatiens capensis*) community in a marshy area along Clear Creek
- jewelweed-moneywort-rice cutgrass (*Leersia oryzoides*)-black willow community around a small, shallow seepage pond [71]

BOTANICAL AND ECOLOGICAL CHARACTERISTICS

SPECIES: *Lysimachia nummularia*

- [GENERAL BOTANICAL CHARACTERISTICS](#)
- [SEASONAL DEVELOPMENT](#)
- [REGENERATION PROCESSES](#)
- [SITE CHARACTERISTICS](#)
- [SUCCESSIONAL STATUS](#)

GENERAL BOTANICAL CHARACTERISTICS:

- [Botanical description](#)
- [Raunkiaer life form](#)

Botanical description: This description covers characteristics that may be relevant to fire ecology and is not meant for identification. Keys for identification are available (e.g., [29,31,40,59,60,66,77,78,87,97]).

Form and architecture: Moneywort is a [rhizomatous](#) prostrate perennial forb [25,31,40] with evergreen to semi-evergreen foliage [45,66,78,105]. Its stems are slender, creep along the ground, and root at the nodes [37,45,60,66,78,105]. It is frequently described as a vine [20,36,100]. The stems can grow to 0.7 to 3.3 feet (0.2-1.0 m) long and 2 to 4 inches (5-10 cm) tall. The stems branch frequently and often form mats [28,29,36,40,97,105].



Photo courtesy of John M. Randall, The Nature Conservancy,

Leaves: Moneywort leaves resemble small coins and give the plant its name. They are round to oval, opposite, simple, and 0.25 to 1.5 inches (0.6-3.8 cm) long [[105](#)]. They occur on short petioles [[29,78](#)]. The upper surfaces of the leaves have widely scattered, glandular, red to black dots [[36,78](#)].

Reproductive structures: Moneywort flowers are hermaphroditic [[23,55](#)]. They are typically solitary in the leaf axil [[60,105](#)]. The 5-lobed corolla is yellow with orange to black dots [[29,31,36,37,60,105](#)].

Although a fact sheet reported that the seed capsule has 5 cells [[36](#)], Uva and others [[108](#)] reported that moneywort fruit is a 1-celled spherical capsule that splits vertically when mature. Seeds weigh about 0.5 mg each [[23,101](#)]. A single seed capsule may contain 1 to 5 seeds [[7](#)]. Seeds are elliptic and about 1 mm long [[108](#)].

Roots: Moneywort roots are slender and fibrous [[36,108](#)]. Moneywort often forms new roots where leaf nodes come in contact with the soil [[36,55,108](#)].

Physiology: Moneywort is flood tolerant [[112](#)]. For more information, see [Site Characteristics](#).

Raunkiaer [[80](#)] life form:

[Chamaephyte](#)

SEASONAL DEVELOPMENT:

Generally, moneywort flowers from May through August:

General flowering dates for moneywort throughout its range in North America	
Location	Dates
Northeast	June-August [105]
	June-July [59]
New England	June 18-July 30 [88]
Illinois	June-August [28,66]
Illinois (Chicago area)	June 17-July 28 [99]
North and South Carolina	May-July [78]
Nova Scotia	July [56]

REGENERATION PROCESSES:

- [Vegetative regeneration](#)
- [Pollination and breeding system](#)
- [Seed production](#)
- [Seed dispersal](#)
- [Seed banking](#)
- [Germination](#)
- [Seedling establishment and plant growth](#)

Moneywort is a rapidly growing, herbaceous perennial that reproduces primarily vegetatively by creeping stems that root at the nodes and also by seed [[45,105,108](#)].

Vegetative regeneration: Moneywort appears to reproduce primarily vegetatively [45,105,108] and often forms vegetative colonies [2,36]. While some floras indicate that moneywort is rhizomatous [25,31,40], most descriptions of moneywort indicate that it reproduces by stems that creep along the ground and root at leaf nodes [36,45,105]. According to Taft [100], moneywort was not known to set fruit in Illinois, and it apparently reproduced entirely vegetatively. In central and northern Europe, Bittrich and Kadereit [7] observed that moneywort was self-incompatible (see [Pollination and breeding system](#)) and speculated that most central and northern European populations were probably vegetative clones.

Vegetative regeneration may be important to moneywort's spread because it may be able to sprout from stem fragments [20,45,105].

Pollination and breeding system: Moneywort is insect pollinated [23,55]. Melittid bees pollinate other yellow loosestrife species and possibly pollinate moneywort [36]. A fact sheet speculated that moneywort often fails to form seed capsules because melittid bees are uncommon in North America (see [Seed production](#)) [36]. However, Cane and others [12] noted that *Macropis nuda* visited native fringed loosestrife but did not visit moneywort despite the fact that moneywort grew within 10 feet (3 m) of a *Macropis nuda* nest site. Vogel (1986 cited in [7]) noted that, despite the presence of suitable pollinators in central and northern Europe, insects, including melittid bees, rarely visited moneywort flowers. In a pollinator preference study in a common garden experiment in Delaware, nonnative European honey bees (*Apis mellifera*) tended to visit moneywort more often than native fringed loosestrife. Conversely, native pollinators tended to visit fringed loosestrife more often than moneywort. The authors reported that the following native invertebrate species visited moneywort during 2 summers: carpenter bees and bumble bees (Apidae), sweat bees (Halictidae), butterflies (Lepidoptera), flies (Diptera), wasps (Hymenoptera), and beetles (Coleoptera) [14].

According to fact sheets, moneywort flowers infrequently [36,105]. Moneywort flowers are hermaphroditic [23,55] and typically self-incompatible [7,26]. In moneywort's native range, self-compatibility appeared more common in eastern and southeastern European populations than in central and northern European populations [7].

Seed production: Seed production by moneywort is rare in the United States [36,81] and in its native range [7]. When seeds are produced, they are often inviable [26,36]. Ray [81] found no viable seeds in North American populations of moneywort in 1956. Despite low viable seed production in many populations, some researchers reported viable moneywort seeds in [seed banks](#) (e.g., [8,23,47]).

Seed production may be favored by intermittent flooding and an open canopy. In its native range in East Bohemia, moneywort appeared along a shoreline after flooding. After the area was flooded again 3 years later, moneywort flowered and produced seeds [49], suggesting that seed production was favored by flooding and that moneywort plants were sexually mature when 3 years old. Conversely, in a greenhouse experiment in France, "extreme dryness" favored fruiting and viable seed production in moneywort (Gagnepain 1927 cited in [81]). In its native range in Great Britain, moneywort spread "almost exclusively by its runners and only produced any appreciable amount of seed in hot summers where the shade was slight" [86].

Seed dispersal: Moneywort seeds are dispersed by water [28,42,49]; a fact sheet stated they may also be spread by animals [105]. Using published information on seed and fruit morphology from *Lysimachia rubida*, a biennial forb native to Bonin Islands, Tokyo, Minor and others [64] concluded that moneywort seeds were dispersed near the mother plant by gravity and not dispersed by wind or animals.

Seed banking: Researchers have reported moneywort in seed banks (e.g., [8,23,42]). In a Freeman maple bottomland swamp in western New York where mean moneywort cover was 0.2%, and moneywort seedlings were the 3rd most dense seedlings observed (\bar{x} =1.32 seedlings/120 cm²), seedling emergence tests indicated a mean density of 1.01 seeds/120 cm² in the upper 2 inches (5 cm) of soil in April [8]. Along Little Otter Creek, Vermont, seed density was measured in October in flood debris and in the upper 2.6 inches (6.5 cm) of soil at 16, 82, and 164 feet (5, 25, and 50 m) from the creek bank. Five moneywort seeds germinated from flood debris collected at 16 and 82 feet, but no moneywort seeds germinated from soil samples collected at these distances. Eleven moneywort seeds germinated from

flood debris and 5 moneywort seeds germinated from soil samples collected at 164 feet from the creek bank. Moneywort density in the standing vegetation increased at greater distances from the creek bank, with no moneywort plants present at 16 feet, 11,000 moneywort stems/ha at 82 feet, and 47,000 stems/ha at 164 feet from the creek bank [42]. According to a review, studies in northwestern Europe reported moneywort seed densities in the seed bank ranging from 48 to 240 seeds/m² [23].

In contrast, other researchers reported that moneywort was sparse or absent from the seed bank despite abundance in the standing vegetation (e.g., [53,54,63,112]). Moneywort was "abundant" in a wet meadow in northeastern France but no moneywort seeds germinated from soil samples taken from the upper 4 inches (10 cm) of soil in April [112]. In a Dutch mixed-hardwood forest, moneywort was present in the herb layer, but only 1 moneywort seed germinated from 28 soil samples taken from the upper 4 inches of soil in late March and early April [47]. In a foxtail-official burnet (*Alopecurus pratensis-Sanguisorba officinalis*) flood-meadow community near Oxford, England, moneywort occurred in 49% of plots, but no moneywort seeds germinated from soil samples taken from the upper 4 inches of soil in November [63].

McDonald and others [63] classified moneywort seeds as transient or short-term persistent in the seed bank. Transient seeds were those that were viable in the soil for <1 year and short-term persistent seeds were those that were viable 1 to 5 years. Moneywort seed-bank classification was determined via a combination of moneywort's presence in the standing vegetation, the absence of moneywort seeds in the soil seed bank, and a review of published literature as of 1996 [63].

Germination: Information on moneywort seed germination was sparse as of this writing (2011). In the laboratory, moneywort seeds collected in Vermont were planted under mesic, well-drained conditions and under hydric, saturated conditions, and only seeds in hydric conditions germinated [42].

Seedling establishment and plant growth: Information on moneywort seedling establishment and plant growth was sparse as of this writing (2011). Once established, moneywort growth may be rapid (see [Impacts](#)) [28].

SITE CHARACTERISTICS:

Moneywort establishes on lowland sites with a range of soil and climatic conditions. Moneywort occurs in full sun to full shade (see [Shade tolerance](#)) [36,113]. It commonly establishes on disturbed sites, though it may occur in relatively undisturbed native plant communities. A fact sheet reported that sites most vulnerable to moneywort establishment included floodplain forests and wetlands [20,61]. See [Habitat Types and Plant Communities](#) for detailed descriptions of some plant communities where moneywort occurs.

- [Soils](#)
- [Climate](#)
- [Elevation](#)
- [Topography](#)

Soils: Moneywort grows best in moderately acidic to neutral [110], poorly drained soils [36,45,55,105].

Texture: Moneywort occurs in clays [16,55,93], silts [79,114], silt loams [44], sandy loams [2,41,42,44,93], loams, loamy sands [2], and sands [2,76,93]. Moneywort may also occur in areas dominated by boulders, stones, cobbles, or gravels [75,76,93].



Photo courtesy of Chris Evans, River to River CWMA, Bugwood.org

pH: Moneywort occurs in soils with pH ranging from 4.0 to 7.2 [2,41,44,110] but grows best in moderately acidic to neutral soils [110]. Along ditch banks in peat areas in its native range in the western Netherlands, moneywort cover and frequency were greater in moderately acidic to neutral (5.6-7.2 pH) soils (0.65% cover; 63% frequency) than in extremely acidic to strongly acidic (4.0-5.5 pH) soils (0.25% cover; 28% frequency) [110].

Soil fertility: Nitrogen and phosphorus are essential for plant growth. Since fire may result in substantial short- and long-term changes in availability of these nutrients (see [48] for a review), knowledge of moneywort's nitrogen and phosphorus requirements may yield important information regarding its potential for postfire establishment and spread. According to reviews, moneywort grows better in fertile soils [23,36]. In eastern cottonwood/black willow floodplain forests in Wisconsin, moneywort occurred in soils with a wide range of total nitrogen, phosphorus, and potassium, but it was most frequent in soils with the highest levels of these nutrients [2]. In contrast, in 28 restored and created wetlands throughout Illinois, moneywort decreased with increased nitrogen availability and also with wetland size ($R^2_{adj}=0.21$) [62]. Along ditch banks in peat areas in its native range in the western Netherlands, moneywort cover was greater in soils with low levels of applied nitrogen (0-250 kg/ha/year) (0.50% cover; 52% frequency) than in those with high levels of applied nitrogen (250-500 kg/ha/year) (0.33% cover; 26% frequency) [110]. In a peat moor in Somerset, England, moneywort showed a negative linear trend with increased nitrogen availability ($P<0.05$). Moneywort may have declined with increased nitrogen because of shading by tall grasses. The authors stated that moneywort is usually absent from areas with high nitrogen availability [67]. Moneywort is endomycorrhizal, and symbiotic arbuscular mycorrhizae increased resource uptake, growth, and flowering in moneywort in greenhouse experiments [35].

Moisture: Moneywort is most common on poorly drained, intermittently flooded soils (e.g., [41,42]). It also grows in shallow water and wet soil (e.g., [5,36,97]) and in dry soil (e.g., [97]). Along New River Gorge National River, moneywort occurred in wetlands, in areas frequently flooded during high water, in areas flooded occasionally, and in xeric communities [97]. Moneywort was considered an obligate wetland species in California and the Northeast and Central Plains regions of the United States and a facultative wetland species in the Southeast, North-central, and Northwest regions. Obligate species were those that occurred in wetlands >99% of the time, and facultative species were those that usually occurred in wetlands (67-99% of the time) but occasionally occurred in nonwetland habitats [82].

Moneywort appears to prefer intermittently flooded areas. In its native range in northeastern France, moneywort was found in periodically flooded (<1 month/year), occasionally flooded (1-3 months/year), and frequently flooded (>4 months/year) alluvial meadows, but was most frequent in occasionally flooded meadows [112]. In a sugar maple floodplain forest in Illinois, most moneywort plants occurred within 1.0 foot (0.3 m) of a streambank where flooding occurred frequently (flooded during 20% of observations), but plants also occurred as far away as 3.9 feet (1.2 m) from the streambank, where flooding occurred infrequently (5% of observations). Moneywort was absent from areas at greater distances from the streambank that rarely flooded ($\leq 3\%$ of observations) [6]. Along Little Otter Creek in

Vermont, moneywort grew in poorly drained soils that were flooded each spring but did not grow in soils flooded for longer periods. Moneywort was absent from a narrow-leaved cattail (*Typha angustifolia*) marsh 16 feet (5 m) from the creek bank where soils were flooded or saturated in all but 1 to 2 months each year. At 33 feet (10 m) from the creek bank, the marsh abruptly transitioned into an open-canopy silver maple-swamp white oak (*Quercus bicolor*)-green ash forest with a shrubby understory. At greater distances from the creek bank, the tree canopy became more closed, the overstory trees became more diverse, flooding only occurred in spring, and moneywort became more common. It occurred with a density of 1,000 stems/ha at 49 feet (15 m) from the creek bank but 47,000 stems/ha at 164 feet (50 m) from the creek bank. At about 230 feet (70 m) from the creek bank, the forest transitioned to a closed-canopy yellow birch-sugar maple-American beech forest, and at 330 feet (100 m) from the creek bank moneywort density declined to 40,000 stems/ha [42]. In Stewart County, Tennessee, moneywort occurred in bottomland hardwood forests with soils that were generally saturated with water from winter to early summer [13].

Moneywort infrequently occurs in dry soils. In the Willamette Valley near west Eugene, Oregon, moneywort occurred in a seasonally flooded wetland prairie where standing water often occurred from November to April due to a shallow clay layer that impeded drainage. In the summer, soils dried out and became hard and deeply cracked, but moneywort survived to the end of the 3-year study [16]. Along the New River Gorge National River, moneywort occurred in Virginia pine-eastern redcedar-post oak woodland, a xeric community with exposed sandstone bedrock and an open canopy [97]. In Guthrie County, Iowa, moneywort occurred in dry and wet closed-canopy hardwood floodplain forests [27].

Climate: Moneywort occurs in temperate climates. As of this writing (2011), little is known about how climate affects moneywort distribution.

Average maximum and minimum temperatures and average annual precipitation of some sites with moneywort in North America			
Location	Average annual temperatures (°C)		Average annual precipitation (mm)
	Minimum	Maximum	
Alexander County, Illinois	10.1	19.4	1,197 [5]
Washington, DC	3.4	31.2	988 [24]
Prince Georges and Charles counties, Maryland	5.9	19.6	1,144 [94]
Stewart County, Tennessee	2.6	25.4	1,268 [13]

In its native range in northeastern France, average annual rainfall was 36 inches (904 mm) and average annual temperature was 48.4 °F (9.1 °C) [112].

Elevation: In North America, moneywort occurs from sea level to at least 5,400 feet (1,600 m) [13,46,65,81]. Moneywort occurs from sea level to 597 feet (182 m) in its native range in the British Isles [23].

Topography: Moneywort generally occurs on level to gently sloping topography (e.g., [13,94,115]).

SUCCESSIONAL STATUS:

Moneywort is apparently able to establish and survive in communities of varied age and disturbance regimes. It is present in early-seral [72,76,92], mid-seral [8], and late-seral [21,41] habitats. Moneywort grows in full sun to full shade.

Shade tolerance: Moneywort can grow in sites with full sun, partial shade, or full shade (e.g., [19,97,113]). Some publications reported that moneywort prefers shady sites [105,108], whereas others reported that moneywort prefers full or partial sun [23,55]. According to a fact sheet, moneywort can tolerate the shade of taller grasses and forbs [36], and it commonly occurs in closed-canopy forests (e.g., [15,27,42]). Conversely, limited evidence suggested that tall grasses may shade out moneywort [67], and moneywort commonly occurs in habitats with an open canopy (e.g.,

[71,74,75,93,97]). In eastern cottonwood/black willow floodplain forests in Wisconsin, moneywort occurred less often in plots with a shrub overstory than in plots without a shrub overstory ($P=0.05$). The authors concluded that moneywort was either a "light specialist" that was inhibited by reduced light under woody understory vegetation or that moneywort did not compete well for available water or nutrients with woody plants [2]. Nonetheless, moneywort can apparently establish on sites with a wide range of overstory and understory conditions. In pin oak-silver maple floodplain forests in the upper Passaic River basin of northern New Jersey, moneywort frequency ranged from 10% to 83% at sites with 100 to 620 trees/ha in the canopy and 20 to 580 stems/ha in the subcanopy [3].

Response to disturbance: Moneywort commonly occurs in areas frequently disturbed by flooding (e.g., [2,75,93]). In central Pennsylvania at the Johnstown Flood National Memorial, moneywort occurred in the fringed loosestrife-Indian hemp association on low terraces and gravel bars in the flood scour zone of the Little Conemaugh River. This association had abundant bare soil because the river periodically scoured the soil and exposed new substrate [75]. In Wisconsin, moneywort occurred in eastern cottonwood/black willow floodplain forests where regular, moderate levels of disturbance occurred annually [2]. In Great Falls Park, Fairfax County, Virginia, moneywort occurred in sycamore-river birch-willow woodland on coarse-textured depositional bars that were flooded multiple times each year [93]. In northeastern Virginia, moneywort occurred in shrubby, early-successional, "highly disturbed" forests dominated by hackberry, eastern redcedar, and sweetgum (*Liquidambar styraciflua*) that were fringing rivers, ponds, and marshes [72].

Moneywort also occurs in anthropogenically disturbed areas. In Indiana, moneywort occurred in a 10-year-old abandoned corn (*Zea mays*) field dominated by common evening primrose (*Oenothera biennis*) [41]. In Athens County, Ohio, moneywort occurred in 7- to 9-year old clearcuts [92].

Occurrence in mid- to late succession: Moneywort is often found in mid- to late-seral communities. According to expert opinion, moneywort in Wisconsin had a high probability of being found in sites that had not been disturbed within the past 10 years [83]. In southwestern Illinois, moneywort was the only nonnative species present in an old-growth floodplain forest dominated by silver maple, boxelder, shellbark hickory (*Carya laciniosa*), slippery elm, and bur oak (*Quercus macrocarpa*) [100]. In the Black Mountains of North Carolina, moneywort occurred in the "climax" cove hardwood forest association. The most frequent tree species were American chestnut (*Castanea dentata*), yellow-poplar, eastern hemlock (*Tsuga canadensis*), northern red oak (*Quercus rubra*), and red maple [21]. In the floodplain of the Millstone River, New Jersey, moneywort occurred in old fields with apple (*Pyrus malus*) and hawthorn (*Crataegus* spp.) that had succeeded to shaded, moist woodlands of slippery elm, American elm (*U. americana*), shagbark hickory (*Carya ovata*), swamp white oak, black cherry, American hornbeam, and osage orange (*Maclura pomifera*). It was also common in "old" white ash-silver maple-pin oak/northern spicebush (*Lindera benzoin*) floodplain forests [111]. In Allegany County, New York, moneywort was recorded in a 70-year-old abandoned farm field dominated by American beech, eastern hophornbeam (*Ostrya virginiana*) and black cherry during 1 year of the study, but was not observed during the 4 subsequent years. This suggested that moneywort established in the old field but did not persist [18].

FIRE EFFECTS AND MANAGEMENT

SPECIES: *Lysimachia nummularia*

- [FIRE EFFECTS](#)
- [FUELS AND FIRE REGIMES](#)
- [FIRE MANAGEMENT CONSIDERATIONS](#)

FIRE EFFECTS:

Immediate fire effect on plant: As of this writing (2011), no information was available in the published literature regarding the immediate effects of fire on moneywort plants or seeds. Moneywort is likely top-killed by fire;

belowground reproductive structures may survive.

Postfire regeneration strategy [95]:

Surface [rhizome](#) and/or a [chamaephytic root crown](#) in organic soil or on soil surface

Rhizomatous herb, [rhizome](#) in soil

[Ground residual colonizer](#) (on site, initial community)

[Initial off-site colonizer](#) (off site, initial community)

[Secondary colonizer](#) (on- or off-site seed sources)

Fire adaptations and plant response to fire:

Fire adaptations: Moneywort exhibits some characteristics that may allow it to survive or establish after fire.

Moneywort reproduces vegetatively by stems that creep along the ground and root at leaf nodes [36,45,105], and floras describe yellow loosestrife in general [31,40] and moneywort specifically [25] as rhizomatous, suggesting that moneywort may reproduce vegetatively after fires that do not kill these reproductive structures. Control recommendations include removing all stems and roots [20,45,105], suggesting the potential for postfire moneywort reestablishment from these structures. Moneywort seeds have the potential for long-distance [dispersal](#) via water, and seeds may persist in the [seed bank](#) for 1 or more years. Moneywort often occurs in disturbed sites with exposed mineral soil and an open canopy, including those created by flooding (see [Successional Status](#)).

Plant response to fire: As of this writing (2011), no studies reported moneywort in burned areas, and no studies documented the response of moneywort to fire. Weed management guidelines suggest that frequent prescribed fires for several years may reduce moneywort in native communities adapted to a regime of frequent fire [20,45]; however, no examples were provided.

FUELS AND FIRE REGIMES:

Fuels: As of this writing (2011) there was no information available regarding the fuel characteristics of moneywort.

Fire regimes: In North America, moneywort occurs in a wide variety of plant communities that are characterized by a range of presettlement fire regimes. Moneywort is common in wetland and riparian floodplain areas, and fire regimes in these communities vary widely across the United States. For example, fire is unusual in northeastern riparian communities and may only occur in times of severe drought or wetland drainage. Riparian plants in these systems may not be fire-adapted. Long fire-return intervals are typical in wetlands of the Northeast (review by [22]). In contrast, fires are common in southeastern wetlands, which support large quantities of flammable, herbaceous vegetation that is well-adapted to frequent fires. Stand-replacement fires may occur in coastal wetlands at 1- to 10-year fire-return intervals (review by [96]). As of 2011, there was insufficient information to predict how moneywort might respond to these fire regimes. It is also unclear if or how moneywort may influence fire regimes. See the [Fire Regime Table](#) for further information on fire regimes of vegetation communities in which moneywort may occur.

FIRE MANAGEMENT CONSIDERATIONS:

Potential for postfire establishment and spread: As of 2011, there are no studies documenting the establishment and spread of moneywort after fire. Moneywort possesses some traits that are likely to allow it to survive and/or establish after fire (see [Fire adaptations](#)).

Preventing postfire establishment and spread: Because of moneywort's potential for long-distance seed dispersal via water, monitoring burned areas downstream of known moneywort populations for potential establishment is advised. Moneywort's potential short-term [seed bank](#) suggests that short-term monitoring may be necessary to limit moneywort establishment in burned areas.

Preventing invasive plants from establishing in weed-free burned areas is the most effective and least costly management method. This may be accomplished through early detection and eradication, careful monitoring and follow-up, and limiting dispersal of invasive plant propagules into burned areas. General recommendations for preventing postfire establishment and spread of invasive plants include:

- Incorporate cost of weed prevention and management into fire rehabilitation plans
- Acquire restoration funding
- Include weed prevention education in fire training
- Minimize soil disturbance and vegetation removal during fire suppression and rehabilitation activities
- Minimize the use of retardants that may alter soil nutrient availability, such as those containing nitrogen and phosphorus
- Avoid areas dominated by high priority invasive plants when locating firelines, monitoring camps, staging areas, and helibases
- Clean equipment and vehicles prior to entering burned areas
- Regulate or prevent human and livestock entry into burned areas until desirable site vegetation has recovered sufficiently to resist invasion by undesirable vegetation
- Monitor burned areas and areas of significant disturbance or traffic from management activity
- Detect weeds early and eradicate before vegetative spread and/or seed dispersal
- Eradicate small patches and contain or control large infestations within or adjacent to the burned area
- Reestablish vegetation on bare ground as soon as possible
- Avoid use of fertilizers in postfire rehabilitation and restoration
- Use only certified weed-free seed mixes when revegetation is necessary

For more detailed information on these topics, see the following publications: [\[4,9,30,106\]](#).

Use of prescribed fire as a control agent: General management guidelines for moneywort in the United States suggest that prescribed fire may be an effective method for controlling moneywort in fire-adapted plant communities [\[20,45\]](#). However, fire effects on moneywort have not been reported in published literature as of 2011. Two sources recommended burning repeatedly for several years during spring or fall when moneywort is green but most native vegetation is dormant [\[20,45\]](#). Prescribed fire is not likely to be a useful control measure for invasive species like moneywort in plant communities where fires are typically rare and native species are not fire-adapted, such as the forested wetlands of the Northeast. In contrast, prescribed fire may be an appropriate tool in herbaceous wetlands that support native species adapted to frequent fire (review by [\[22\]](#)).

MANAGEMENT CONSIDERATIONS

SPECIES: *Lysimachia nummularia*

- [FEDERAL LEGAL STATUS](#)
- [OTHER STATUS](#)
- [IMPORTANCE TO WILDLIFE AND LIVESTOCK](#)
- [OTHER USES](#)
- [IMPACTS AND CONTROL](#)

FEDERAL LEGAL STATUS:

None

OTHER STATUS:

Information on state-level noxious weed status of plants in the United States is available at [Plants Database](#).

IMPORTANCE TO WILDLIFE AND LIVESTOCK:

Palatability and/or nutritional value: Moneywort foliage was consumed by woodland jumping mice near Ithaca, New York [\[116\]](#) and by white-tailed deer in east-central Illinois [\[69\]](#). According to a fact sheet, rabbits and groundhogs may occasionally eat moneywort. Plant secondary compounds apparently make moneywort foliage bitter and unpalatable to many mammalian herbivores [\[36\]](#).

Moneywort flowers are visited by a variety of invertebrates, particularly bees (see [Pollination and breeding system](#)). On the British Isles, aphids (Pemphigidae) feed on the stems and roots of moneywort [23].

Cover value: No information is available on this topic.

OTHER USES:

According to a fact sheet, moneywort may provide erosion control [105]. Historically, tea made from the leaves and flowers was used as an astringent, as a diuretic, to treat scurvy, and to promote wound healing [55].

IMPACTS AND CONTROL:

Impacts: A variety of fact sheets, government publications, and weed management guides suggest that moneywort populations form dense mats that may exclude other plants, including native species [28,29,36,40,97,105]. Moneywort's ability to dominate an area is attributed to its fast vegetative spread [28,36,61]. In floodplain forest of the lower Wisconsin River, moneywort was absent from a silver maple-green ash-elm (*Ulmus* spp.) floodplain forest in the 1950s but was one of the most frequent groundlayer species (second only to reed canarygrass (*Phalaris arundinacea*)) about 50 years later. The forest had become wetter over the 50 years, and there was an apparent loss of 2 native species possibly as a result of moneywort and reed canarygrass spread [32].

Although moneywort can occasionally become dominant in plant communities (e.g., [46,97]), it typically does not substantially modify natural habitats over large areas [68]. Most fact sheets, government publications, and weed management guides indicated that moneywort had no more than a moderate impact on native vegetation [20,68,83,104,117]. In a western Massachusetts silver maple-pin oak-green ash/buttonbush floodplain swamp forest, moneywort changed little in frequency and cover over approximately 27 years (1969: <0.5% cover, 2% frequency; 1996: 1% cover, 9% frequency) [39].

Control: Moneywort control may be complicated by its ability to sprout from stems and possibly roots following control treatments [20,45,105]. A fact sheet suggested that control efforts should focus on cessation of planting, management of existing infestations, and minimization of disturbance to forests, wetlands, and other natural communities [105]. Control effectiveness may depend on a program that integrates multiple management procedures such as herbicides, prescribed fire, seeding, and other techniques that decrease moneywort spread and favor desired species [45,105].

In all cases where invasive species are targeted for control, no matter what method is employed, the potential for other invasive species to fill their void must be considered [10]. Control of biotic invasions is most effective when it employs a long-term, ecosystem-wide strategy rather than a tactical approach focused on battling individual invaders [58].

Prevention: A fact sheet suggests that moneywort establishment may be prevented by minimizing soil disturbance [105]. Consumers should also avoid purchasing and planting moneywort [20,105].

It is commonly argued that the most cost-efficient and effective method of managing invasive species is to prevent their establishment and spread by maintaining "healthy" natural communities [58,89] (e.g., avoid road building in wildlands [103]) and by monitoring several times each year [43]. Managing to maintain the integrity of the native plant community and mitigate the factors enhancing ecosystem invasibility is likely to be more effective than managing solely to control the invader [38].

Weed prevention and control can be incorporated into many types of management plans, including those for logging and site preparation, grazing allotments, recreation management, research projects, road building and maintenance, and fire management [106]. See the [Guide to noxious weed prevention practices](#) [106] for specific guidelines in preventing the spread of weed seeds and propagules under different management conditions.

Fire: For information on the use of prescribed fire to control this species, see [Fire Management Considerations](#).

Cultural control: Some sources indicate that moneywort may be controlled by establishing native grasses that shade out moneywort [45,105]. However, a fact sheet noted that moneywort can tolerate shading by taller grasses and forbs [36]. For more information on this topic, see [Shade tolerance](#).

Physical or mechanical control: Activities that disturb moneywort plants, such as hand-pulling, may stimulate growth of new plants from fragmented stems and possibly roots or rhizomes. Management guidelines suggest that small infestations of moneywort may be eradicated by carefully digging out plants; however, all stems and roots must be removed for this technique to be effective [20,45,105]. In a seasonally flooded wetland prairie in the Willamette Valley, Oregon, moneywort cover declined 1 and 3 years after hand removal compared to pretreatment levels, but the difference was not significant. Moneywort cover also declined in control plots during the study [16].

Two sources reported that mowing does not control moneywort because the plants are typically too low to the ground to be impacted by mowing blades [45,105]. Moreover, physical disturbance by machinery may spread moneywort across fields. Fleming and Kanal [24] speculated mowing equipment may have spread moneywort from a lawn in Washington, DC, into nearby meadows and roadsides. In the Montezuma National Wildlife Refuge in central New York, moneywort was not present in grasslands succeeded to gray dogwood (*Cornus racemosa*), common buckthorn (*Rhamnus cathartica*), and multiflora rose (*Rosa multiflora*) prior to mowing, but moneywort cover ranged from 0.6% to 0.9% 3 years after mowing. Moneywort was not present in control plots [84]. Several researchers reported moneywort in areas mowed annually or more frequently (e.g., [13,34,92]). In a seasonally flooded tall oatgrass (*Arrhenatherum elatius*) grassland in the Netherlands, mowing in June and again in September increased moneywort frequency during 8 years. The authors suggested that repeated reduction of grasses increased the frequency of moneywort and other low-lying plants. Moneywort frequency decreased or remained unchanged in areas mowed annually. Moneywort was absent in unmowed areas [70].

Some publications reported that moneywort may be killed by prolonged submergence in water [45,105]. However, a study in East Bohemia reported that moneywort survived flooding that covered the entire plant and that moneywort seed production was perhaps favored by the flooding [49]. For more information on this study, see [Seed production](#). For more information on moneywort's soil moisture tolerance, see [Site Characteristics](#).

Biological control: No biological controls of moneywort are known [45]. In the northern Front Range of Colorado, Al-Doghairi and Cranshaw [1] observed little to no visitation of moneywort by native arthropods typically used in biological control of pest plants (e.g., lady beetles (Coccinellidae), green lacewings (Chrysopidae), syrphid flies (Syrphidae), parasitic wasps (Braconidae), predatory wasps (Sphecidae), and technid flies (Tachinidae)).

Biological control of invasive species has a long history that indicates many factors must be considered before using biological controls. Refer to these sources: [109,118] and the [Weed control methods handbook](#) [102] for background information and important considerations for developing and implementing biological control programs.

Chemical control: Herbicides may control moneywort, although little information regarding the effectiveness of herbicides on moneywort was available as of this writing (2011) [45,105]. Herbicides are effective in gaining initial control of a new invasion or a severe infestation, but they are rarely a complete or long-term solution to weed management [11]. See the [Weed control methods handbook](#) [102] for considerations on the use of herbicides in natural areas and detailed information on specific chemicals.

Integrated management: Integrated management includes considerations of not only killing the target plant but also of establishing desirable species and maintaining weed-free systems over the long term. Integrated management techniques may be more effective than individual methods at controlling moneywort, but as of this writing (2011) no information was available on this topic.

APPENDIX: FIRE REGIME TABLE

SPECIES: *Lysimachia nummularia*

This Fire Regime Table summarizes characteristics of fire regimes for vegetation communities in which moneywort may occur based on descriptions in available literature. Follow the links in the table to documents that provide more detailed information on these fire regimes. This table does not include plant communities across the entire range of moneywort. For information on other plant communities in which moneywort may occur, see the complete [FEIS Fire Regime Table](#).

Fire regime information on vegetation communities in which moneywort may occur. This information is taken from the [LANDFIRE Rapid Assessment Vegetation Models](#) [51], which were developed by local experts using available literature, local data, and/or expert opinion. This table summarizes fire regime characteristics for each plant community listed. The PDF file linked from each plant community name describes the model and synthesizes the knowledge available on vegetation composition, structure, and dynamics in that community. Cells are blank where information is not available in the Rapid Assessment Vegetation Model.

[Pacific Northwest](#) [California](#) [Northern Great Plains](#) [Great Lakes](#)
[Northeast](#) [South-central US](#) [Southern Appalachians](#) [Southeast](#)

Pacific Northwest

- [Northwest Grassland](#)

Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)

Northwest Grassland

Marsh	Replacement	74%	7		
	Mixed	26%	20		

California

- [California Grassland](#)

Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)

California Grassland

Herbaceous wetland	Replacement	70%	15		
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	Mixed	30%	35		
Northern Great Plains					
<ul style="list-style-type: none"> Northern Plains Woodland 					
Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)
Northern Plains Woodland					
Northern Great Plains wooded draws and ravines	Replacement	38%	45	30	100
	Mixed	18%	94		
	Surface or low	43%	40	10	
Great Plains floodplain	Replacement	100%	500		
Great Lakes					
<ul style="list-style-type: none"> Great Lakes Forested 					
Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)
Great Lakes Forested					
Great Lakes floodplain forest	Mixed	7%	833		
	Surface or low	93%	61		
Maple-basswood mesic hardwood forest (Great Lakes)	Replacement	100%	>1,000	≥1,000	>1,000
Northeast					
<ul style="list-style-type: none"> Northeast Grassland Northeast Forested 					

Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)
Northeast Grassland					
Northern coastal marsh	Replacement	97%	7	2	50
	Mixed	3%	265	20	
Northeast Forested					
Northern hardwoods (Northeast)	Replacement	39%	≥1,000		
	Mixed	61%	650		
Beech-maple	Replacement	100%	>1,000		
South-central US					
<ul style="list-style-type: none"> South-central US Forested 					
Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)
South-central US Forested					
Southern floodplain	Replacement	42%	140		
	Surface or low	58%	100		
Southern floodplain (rare fire)	Replacement	42%	≥1,000		
	Surface or low	58%	714		
Southern Appalachians					

- [Southern Appalachians Forested](#)

Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)

Southern Appalachians Forested

Bottomland hardwood forest	Replacement	25%	435	200	≥1,000
	Mixed	24%	455	150	500
	Surface or low	51%	210	50	250
Mixed mesophytic hardwood	Replacement	11%	665		
	Mixed	10%	715		
	Surface or low	79%	90		

Southeast

- [Southeast Grassland](#)
- [Southeast Forested](#)

Vegetation Community (Potential Natural Vegetation Group)	Fire severity*	Fire regime characteristics			
		Percent of fires	Mean interval (years)	Minimum interval (years)	Maximum interval (years)

Southeast Grassland

Floodplain marsh	Replacement	100%	4	3	30
Southern tidal brackish to freshwater marsh	Replacement	100%	5		

Southeast Forested

Maritime forest	Replacement	18%	40		500

	Mixed	2%	310	100	500
	Surface or low	80%	9	3	50
Southern floodplain	Replacement	7%	900		
	Surface or low	93%	63		

*Fire Severities—

Replacement: Any fire that causes greater than 75% top removal of a vegetation-fuel type, resulting in general replacement of existing vegetation; may or may not cause a lethal effect on the plants.

Mixed: Any fire burning more than 5% of an area that does not qualify as a replacement, surface, or low-severity fire; includes mosaic and other fires that are intermediate in effects.

Surface or low: Any fire that causes less than 25% upper layer replacement and/or removal in a vegetation-fuel class but burns 5% or more of the area [[33,50](#)].

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