Taxon: Alchemilla mollis (Buser) Rothm. **Family:** Rosaceae

Common Name(s): garden lady's-mantle
lady's mantle

Synonym(s): Alchemilla acutiloba Steven
Alchemilla acutiloba Steven var.
Alchemilla acutiloba Steven var.

Assessor: Chuck Chimera **Status:** Assessor Approved **End Date:** 22 Jan 2021

WRA Score: 6.5 **Designation:** H(HPWRA) **Rating:** High Risk

Keywords: Temperate Perennial, Naturalized Elsewhere, Weedy, Apomictic, Self-Seeds

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	Low
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	n
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	y
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed	n=0, y = 2*multiplier (see Appendix 2)	n
304	Environmental weed	n=0, y = 2*multiplier (see Appendix 2)	n
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals	y=1, n=-1	y
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens	y=1, n=0	n
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n
409	Is a shade tolerant plant at some stage of its life cycle	y=1, n=0	y

Qsn #	Question	Answer Option	Answer
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	y
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets		
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally		
604	Self-compatible or apomictic	y=1, n=-1	y
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)	1 year = 1, 2 or 3 years = 0, 4+ years = -1	2
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	y=1, n=-1	y
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant		
704	Propagules adapted to wind dispersal	y=1, n=-1	n
705	Propagules water dispersed		
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m2)		
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	**Is the species highly domesticated?**	**n**
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	[No evidence of domestication] "Flowering late Jul–Sep. Densely vegetated lake shores; 0–100 m; introduced; B.C., Ont.; Europe (e Carpathians); w Asia (Caucasus, Turkey)."

102	**Has the species become naturalized where grown?**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	NA

103	**Does the species have weedy races?**	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	NA

201	**Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"**	**Low**
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	"Native Asia-Temperate WESTERN ASIA: Turkey (n.) Europe EASTERN EUROPE: Ukraine SOUTHEASTERN EUROPE: Romania Cultivated (widely cult. in temperate regions)"

202	**Quality of climate match data**	**High**
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	

203	**Broad climate suitability (environmental versatility)**	**y**
	Source(s)	**Notes**

Qsn #	Question	Answer
	Dave's Garden. (2021). Alchemilla Species, Lady's Mantle - Alchemilla mollis. https://davesgarden.com/guides/pf/go/179/. [Accessed 20 Jan 2021]	"Hardiness: USDA Zone 3a: to -39.9 °C (-40 °F) USDA Zone 3b: to -37.2 °C (-35 °F) USDA Zone 4a: to -34.4 °C (-30 °F) USDA Zone 4b: to -31.6 °C (-25 °F) USDA Zone 5a: to -28.8 °C (-20 °F) USDA Zone 5b: to -26.1 °C (-15 °F) USDA Zone 6a: to -23.3 °C (-10 °F) USDA Zone 6b: to -20.5 °C (-5 °F) USDA Zone 7a: to -17.7 °C (0 °F) USDA Zone 7b: to -14.9 °C (5 °F) USDA Zone 8a: to -12.2 °C (10 °F) USDA Zone 8b: to -9.4 °C (15 °F)"
	Plants for a Future. (2021). Alchemilla mollis. https://pfaf.org/user/Plant.aspx?LatinName=Alchemilla+mollis. [Accessed 20 Jan 2021]	"USDA hardiness 3-8" [6 hardiness zones]
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 20 Jan 2021]	"Zone: 3 to 7 " [5 hardiness zones]

204	Native or naturalized in regions with tropical or subtropical climates	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	"Native Asia-Temperate WESTERN ASIA: Turkey (n.) Europe EASTERN EUROPE: Ukraine SOUTHEASTERN EUROPE: Romania Cultivated (widely cult. in temperate regions)"
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Preferred Climate/s: Mediterranean Origin: E Asia, Europe"
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	No evidence

205	Does the species have a history of repeated introductions outside its natural range?	y
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	"Cultivated (widely cult. in temperate regions)"

301	Naturalized beyond native range	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Kurtto, A., Uotila, P., & Sennikov, A. (2009). Alchemilla in Mediterranean Europe as revealed by Atlas Florae Europaeae. Bocconea, 23, 221-235	"Alchemilla mollis, which is widely cultivated for ornament and widely naturalized in western and central Europe, also belongs to the species restricted to the Romanian Carpathians and the Balkan Peninsula (Stara Planina and northern Greece) in Europe. However, this species is also native to Anatolia, the Caucasus and Iran."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"References: United Kingdom-N-40, United Kingdom-C-314, Czech Republic-U-400, United Kingdom-N-519, Austria-CN-708, Denmark-C-711, United Kingdom-CN-812, New Zealand-U-824, Ireland-N-894, New Zealand-U-919, Belgium-N-1006, Germany-N-1006, United Kingdom-N-1006, Iceland-N-1006, Netherlands-N-1006, Europe-N-819, United States of America-N-1162, United Kingdom-W-1175, Belgium-N-1220, Norway-N-1243, Italy-U-251, Slovakia-U-1484, Norway-N-1535, Austria-W-1609, Denmark-W-1609, Germany-W-1609, Netherlands-W-1609, Norway-W-1609, Sweden-W-1609, Iceland-W-1609, United Kingdom-N-1636, Global-CD-1611, Czech Republic-U-1731, Iceland-N-1552, United States of America-E-1736, Europe-N-1740, Russia-C-1671, Austria-N-1828, Italy-U-1887, -I-, New Zealand-U-2048, Austria-W-1977, Belgium-W-1977, Czech Republic-W-1977, Denmark-W-1977, France-W-1977, Germany-W-1977, Iceland-W-1977, Ireland-W-1977, Italy-W-1977, Netherlands-W-1977, Slovakia-W-1977, Sweden-W-1977, United Kingdom-W-1977."
	Heenan, P. B., de Lange, P. J., Cameron, E. K., & Parris, B. S. 2008. Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 2004–06. New Zealand Journal of Botany, 46(2): 257-283	[Alchemilla mollis] "NOTES: Spontaneous Occurrence. Plants established at the base of a streetside stone wall and within railway ballast. No evidence at either site of cultivated plants."

302	Garden/amenity/disturbance weed	y
	Source(s)	**Notes**
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"A. mollis is easily propagated by seed (and readily self seeds in many gardens, to the point of being invasive in ideal growing conditions). Seedlings are easily identifiable, as they have the same three-lobed leaves as the adult plants. Volunteers are easily weeded out or moved."
	Ronse, A. (2011). Botanic garden escapes' from the living collections at the Botanic Garden. The spontaneous flora of the National Botanic Garden of Belgium (Domein van Bouchout, Meise). Scripta Botanica Belgica, 47, 89-111	"Alchemilla mollis (Rosaceae) is a herbaceous species from south-eastern Europe and southwestern Asia that is often cultivated in gardens. In Flanders, it is a recent and still very rare new garden escape, mainly restricted to urban areas. In the Botanic Garden it has been planted in the herbetum, from where it escapes in lawns but remains in the close vicinity."
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 19 Jan 2021]	"Freely self-seeds in the garden to the point of being somewhat invasive in optimum growing conditions. Prompt removal of spent flower stems will not only prevent self-seeding but may also encourage a sparse, late summer rebloom."

Qsn #	Question	Answer
	Nawrocki, T. (2011). lady's mantle Alchemilla mollis (Buser) Rothm. hairy lady's mantle Alchemilla monticola Opiz. Alaska Natural Heritage Program, University of Alaska, Anchorage	"In Finland, Alchemilla species grow in open or semi-open, often human-influenced habitats (NatureGate 2011). In Britain, hairy lady's mantle frequently grows in road edges (PlantNetwork 2011). Most infestations of lady's mantle recorded in Alaska are associated with disturbed areas (AKEPIC 2011), suggesting that disturbances favor the establishment of this species. However, lady's mantle has been observed spreading into leaf litter under a dense canopy of Sitka alder in Hoonah, AK (Krieckhaus pers. comm.)."
	Learning with experts. (2015). Unpopular Plants Worth Growing. By Andy McIndoe. https://www.learningwithexperts.com. [Accessed 19 Jan 2021]	"Lady's mantle, Alchemilla mollis is a great example of an excellent garden plant that gardeners complain about. Sure, it seeds and spreads. Mainly because we let it. If we cut it back as soon as the flowers start to fade it can be kept in check, but we forget and consequently seedlings emerge anywhere they can avoid disturbance. Planted under the hedge or under mature shrubs or trees alchemilla can survive where lesser plants wither and perish. Make the most of it."
	Nawrocki, T., et al. (2011). Invasiveness ranking of 50 non-native plant species for Alaska. Alaska Natural Heritage Program. Univ. Alaska Anchorage, Anchorage	[Moderate threat to native ecosystems, but not enough information in this report to classify as an environmental weed] "The overall invasiveness ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems" … "Appendix 1: Summary Scores of Invasiveness Ranks of 164 Non-Native Plants Ordered by Invasiveness" [Alchemilla mollis - Invasiveness = 56]

303	Agricultural/forestry/horticultural weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	n
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

305	Congeneric weed	y
	Source(s)	**Notes**
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	[Multiple species listed as weeds] Alchemilla arvensis - Weed of: Cereals; Alchemilla monticola - Weed of: Cereals; Alchemilla vulgaris - Weed of: Cereals

401	Produces spines, thorns or burrs	n
	Source(s)	**Notes**

Qsn #	Question	Answer
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	[No evidence] "Plants large to very large, yellowish green, <to 80 cm, often very robust, densely hairy, hairs patent, soft>. Stems densely spreading-hairy (to inflorescences). Leaves: stipules translucent, usually pale pink proximally, <lobes turning brownish>; blade orbiculate or reniform orbiculate, 9–11-lobed, margins flat or slightly undulate, basal sinuses narrow to almost closed, <basal lobes sometimes overlapping>, middle lobes <with lateral sides convex or slightly concave at base>, shorter than to as long as their half-widths; incisions absent; teeth slightly connivent or not, ± symmetric, apex acute or subacute, surfaces densely hairy throughout. Inflorescences: primary branches densely hairy; <peduncles pubescent or almost glabrous>."

402	Allelopathic	
	Source(s)	**Notes**
	Shiraishi, S., Watanabe, I., Kuno, K., & Fujii, Y. (2002). Allelopathic activity of leaching from dry leaves and exudate from roots of ground cover plants assayed on agar. Weed Biology and Management, 2(3), 133-142	[Alchemilla mollis leachates demonstrate some allelopathic activity, but effects in natural settings unknown] "The effects of leaches from dry leaves of 71 ground cover plant species on lettuce were tested at the first screening. The inhibitory effects on radicle and hypocotyl elongations of lettuce varied with the different species of cover plants that were used. Eight species of Oxalis showed strong inhibitions (4–27% of untreated control on radicle elongation). Inhibitory activities of seven species of cover plants on three weed species, live amaranth (Amaranthus lividus), southern crabgrass (Digitaria ciliaris) and common lambsquarters (Chenopodium album), were tested at the second screening. Moss pink (Phlox subulata), trefoil (Oxalis brasiliensis), red spiderlily (Lycoris radiata), creeping thyme (Thymus serpyllum), European pennyroyal (Mentha pulegium), roman chamomile (Chamaemelum nobile) and star-of-Bethlehem (Ornithogalum umbellatum) were selected as donor plants because of their high inhibitory effects on lettuce growth and their usefulness as ornamental ground cover plants. Effects of leaches from dry leaves and exudates from the roots of these species were assayed on agar. Radicle elongations of all tested weed species were inhibited by leaches from trefoil and red spiderlily (8–31% and 14–24% of untreated control, respectively) and exudates from moss pink, trefoil and creeping thyme (11–43%, 31–74% and 22–67% of untreated control, respectively)."

403	Parasitic	n
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	"Plants large to very large, yellowish green, <to 80 cm, often very robust, densely hairy, hairs patent, soft>. Stems densely spreading-hairy (to inflorescences)."

404	Unpalatable to grazing animals	y
	Source(s)	**Notes**

Qsn #	Question	Answer
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"It has almost no pests and is not favored by deer."
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 20 Jan 2021]	"Tolerate: Rabbit, Deer" [May be unpalatable]
	Soderstrom, N. (2009). Deer-Resistant Landscaping: Proven Advice and Strategies for Outwitting Deer and 20 Other Pesky Mammals. Rodale, New York	[Deer-Resistant] "Tannins are the likely repellents."

405	Toxic to animals	n
	Source(s)	**Notes**
	Plants for a Future. (2021). Alchemilla mollis. https://pfaf.org/user/Plant.aspx?LatinName=Alchemilla+mollis. [Accessed 20 Jan 2021]	"Known Hazards - None Known"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	n
	Source(s)	**Notes**
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"It has almost no pests and is not favored by deer."
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 19 Jan 2021]	"No serious insect or disease problems."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	**Notes**
	Dave's Garden. (2021). Alchemilla Species, Lady's Mantle - Alchemilla mollis. https://davesgarden.com/guides/pf/go/179/. [Accessed 20 Jan 2021]	"Danger: N/A"
	Plants for a Future. (2021). Alchemilla mollis. https://pfaf.org/user/Plant.aspx?LatinName=Alchemilla+mollis. [Accessed 20 Jan 2021]	"Known Hazards None Known"
	Quattrocchi, U. 2012. CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n

Qsn #	Question	Answer
	Source(s)	**Notes**
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 22 Jan 2021]	[No evidence and unlikely given habit and habitat in natural and cultivated settings] "Easily grown in average, medium moisture, well-drained soils in full sun to part shade, but tolerates close to full shade. Prefers part afternoon shade in hot summer climates. Performs well in moist garden areas."

409	Is a shade tolerant plant at some stage of its life cycle	y
	Source(s)	**Notes**
	Anisko, T. (2008). When Perennials Bloom: An Almanac for Planning and Planting. Timber Press, Portland, Oregon	"Alchemilla mollis grows well in light shade under a high canopy of trees as long as the soil stays evenly moist."
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 19 Jan 2021]	"Easily grown in average, medium moisture, well-drained soils in full sun to part shade, but tolerates close to full shade. Prefers part afternoon shade in hot summer climates."
	Eom, S. H., Senesac, A. F., Tsontakis-Bradley, I., & Weston, L. A. (2005). Evaluation of herbaceous perennials as weed suppressive groundcovers for use along roadsides or in landscapes. Journal of Environmental Horticulture, 23(4), 198-203	"Lady's mantle is becoming markedly more popular in recent years and adapts well to both full sun and shaded sites."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	**Notes**
	Anisko, T. (2008). When Perennials Bloom: An Almanac for Planning and Planting. Timber Press, Portland, Oregon	"Although it is not demanding with regard to the soil, choose for A. mollis a site with preferably moist but appearance. Plant it in partial shade or full sun."
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 19 Jan 2021]	"Easily grown in average, medium moisture, well-drained soils in full sun to part shade, but tolerates close to full shade. Prefers part afternoon shade in hot summer climates."
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"It tolerates most soils, except overly moist conditions, and does well in clay."

411	Climbing or smothering growth habit	n
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	"Plants large to very large, yellowish green, <to 80 cm, often very robust, densely hairy, hairs patent, soft>. Stems densely spreading-hairy (to inflorescences)."

412	Forms dense thickets	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Nawrocki, T. (2011). lady's mantle Alchemilla mollis (Buser) Rothm. hairy lady's mantle Alchemilla monticola Opiz. Alaska Natural Heritage Program, University of Alaska, Anchorage	"Lady's mantle can form dense patches (Eom et al. 2005) and likely reduces the availability of soil nutrients and moisture. However, the impacts of this species on natural ecosystem processes are largely undocumented."
	Eom, S. H., Senesac, A. F., Tsontakis-Bradley, I., & Weston, L. A. (2005). Evaluation of herbaceous perennials as weed suppressive groundcovers for use along roadsides or in landscapes. Journal of Environmental Horticulture, 23(4), 198-203	[Dense cover may suppress weeds and other vegetation] "Alchemilla mollis, commonly called lady's mantle, is propagated either by division of roots or seed germination. In previous work, Alchemilla mollis was cited as potentially invasive in field settings due to prolific seed dispersal (14). However, we did not observe any signs of invasive growth habit during the two years in which this experiment was conducted. The dense canopy of broad scalloped leaves resulted in little light reaching the soil surface, which helped to suppress weed seed germination."

501	Aquatic	n
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	[Terrestrial] "Densely vegetated lake shores;0–100 m; introduced; B.C., Ont.; Europe (e Carpathians); w Asia (Caucasus, Turkey)."

502	Grass	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	Family: Rosaceae Subfamily: Rosoideae Tribe: Potentilleae Subtribe: Fragariinae

503	Nitrogen fixing woody plant	n
	Source(s)	**Notes**
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	[Not among the genera in Rosaceae reported to fix nitrogen] Family: Rosaceae Subfamily: Rosoideae Tribe: Potentilleae Subtribe: Fragariinae

504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	"Plants large to very large, yellowish green, <to 80 cm, often very robust, densely hairy, hairs patent, soft>. Stems densely spreading-hairy (to inflorescences)."

Qsn #	Question	Answer
601	**Evidence of substantial reproductive failure in native habitat**	**n**
	Source(s)	**Notes**
	Plants for a Future. (2021). Alchemilla mollis. https://pfaf.org/user/Plant.aspx?LatinName=Alchemilla+mollis. [Accessed 20 Jan 2021]	"IUCN Red List of Threatened Plants Status : Not Listed"

602	**Produces viable seed**	**y**
	Source(s)	**Notes**
	Missouri Botanical Garden. (2021). Alchemilla mollis 'Thriller'. https://www.missouribotanicalgarden.org. [Accessed 19 Jan 2021]	"Freely self-seeds in the garden to the point of being somewhat invasive in optimum growing conditions. Prompt removal of spent flower stems will not only prevent self-seeding but may also encourage a sparse, late summer rebloom."

603	**Hybridizes naturally**	
	Source(s)	**Notes**
	Hayirhoğlu-Ayaz, S., İnceer, H., & Frost-Olsen, P. (2006). Chromosome Counts in the Genus Alchemilla (Rosaceae) from SW Europe. Folia Geobotanica, 41(3), 335-344	[Unknown if natural hybridization currently occurs between species] "A very complex and hybrid origin of recent Alchemilla species is suggested also by their high and different chromosome numbers (IZMAILOW 1982). Assumptions concerning the hybrid origin of the apomictic species of Alchemilla are also to some extent supported by disturbances of microsporogenesis as .well as pollen grain development (WEGENER 1967)."

604	**Self-compatible or apomictic**	**y**
	Source(s)	**Notes**
	Kurtto, A., Uotila, P., & Sennikov, A. (2009). Alchemilla in Mediterranean Europe as revealed by Atlas Florae Europaeae. Bocconea, 23, 221-235	"Reproduction mode in Alchemilla is almost obligate apomixis"

605	**Requires specialist pollinators**	**n**
	Source(s)	**Notes**
	Kurtto, A., Uotila, P., & Sennikov, A. (2009). Alchemilla in Mediterranean Europe as revealed by Atlas Florae Europaeae. Bocconea, 23, 221-235	"Reproduction mode in Alchemilla is almost obligate apomixis"

606	**Reproduction by vegetative fragmentation**	**y**
	Source(s)	**Notes**
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"Plants spread very slowly by rhizomes, forming mounds 12-15" tall that spread to two feet or more." [Spreads locally by rhizomes]

607	**Minimum generative time (years)**	**2**

Qsn #	Question	Answer
	Source(s)	**Notes**
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"It will take at least two years from seeding until plants bloom."

701	**Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)**	**y**
	Source(s)	**Notes**
	Hodkinson, D. J., & Thompson, K.. (1997). Plant Dispersal: The Role of Man. Journal of Applied Ecology, 34(6), 1484–1496	"Appendix Species associated with each of the dispersal vectors studied." [Alchemilla mollis - Garden throw-outs]

702	**Propagules dispersed intentionally by people**	**y**
	Source(s)	**Notes**
	Anisko, T. (2008). When Perennials Bloom: An Almanac for Planning and Planting. Timber Press, Portland, Oregon	"Alchemilla mollis is the most commonly grown species of Alchemilla"
	USDA, Agricultural Research Service, National Plant Germplasm System. (2021). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/. [Accessed 19 Jan 2021]	"Cultivated (widely cult. in temperate regions)"

703	**Propagules likely to disperse as a produce contaminant**	
	Source(s)	**Notes**
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 22 Jan 2021]	[Unknown. Commonly cultivated and ability to self-seed could result in contamination of media or other plants cultivated in proximity] "A. mollis is easily propagated by seed (and readily self seeds in many gardens, to the point of being invasive in ideal growing conditions)."

704	**Propagules adapted to wind dispersal**	**n**
	Source(s)	**Notes**
	Bojňanský, V. & Fargašová, A. 2007. Atlas of Seeds and Fruits of Central and East-European Flora: The Carpathian Mountains Region. Springer, Dordrecht, The Netherlands	"Fruits achenes, broad ovoid, slight flattish, apex acute and curved, small attachment scar basal, suture distinct, 1.2-1.4 x 0.8-1 mm. Surface glabrous, fine areolate, light-brown to brown." [Achenes lack specific adaptations for dispersal. Wind may influence distance and direction of dispersal, but majority of seeds may fall directly under or around parent plants]

Qsn #	Question	Answer
705	**Propagules water dispersed**	
	Source(s)	**Notes**
	Flora of North America Editorial Committee. (2014). Flora of North America: North of Mexico, Volume 9. Magnoliophyta: Picramniaceae to Rosaceae. Oxford University Press, New York and Oxford	[Distribution along lakes suggests water may disperse seeds, although it is not known to be specifically adapted for water dispersal] "Densely vegetated lake shores; 0–100 m; introduced; B.C., Ont.; Europe (e Carpathians); w Asia (Caucasus, Turkey)."

706	**Propagules bird dispersed**	**n**
	Source(s)	**Notes**
	Bojňanský, V. & Fargašová, A. 2007. Atlas of Seeds and Fruits of Central and East-European Flora: The Carpathian Mountains Region. Springer, Dordrecht, The Netherlands	"Fruits achenes, broad ovoid, slight flattish, apex acute and curved, small attachment scar basal, suture distinct, 1.2-1.4 x 0.8-1 mm. Surface glabrous, fine areolate, light-brown to brown." [No evidence. Not fleshy-fruited]

707	**Propagules dispersed by other animals (externally)**	**n**
	Source(s)	**Notes**
	Bojňanský, V. & Fargašová, A. 2007. Atlas of Seeds and Fruits of Central and East-European Flora: The Carpathian Mountains Region. Springer, Dordrecht, The Netherlands	"Fruits achenes, broad ovoid, slight flattish, apex acute and curved, small attachment scar basal, suture distinct, 1.2-1.4 x 0.8-1 mm. Surface glabrous, fine areolate, light-brown to brown." [Small size may allow for some adherence to passing animals, but achenes otherwise lack means of external attachment]

708	**Propagules survive passage through the gut**	**n**
	Source(s)	**Notes**
	Bojňanský, V. & Fargašová, A. 2007. Atlas of Seeds and Fruits of Central and East-European Flora: The Carpathian Mountains Region. Springer, Dordrecht, The Netherlands	"Fruits achenes, broad ovoid, slight flattish, apex acute and curved, small attachment scar basal, suture distinct, 1.2-1.4 x 0.8-1 mm. Surface glabrous, fine areolate, light-brown to brown." [No evidence. No adaptations for consumption or internal dispersal]

801	**Prolific seed production (>1000/m2)**	
	Source(s)	**Notes**
	Mahr, S. (2010). Lady's Mantle, Alchemilla mollis. Master Gardener Program, University of Wisconsin-Madison. https://mastergardener.extension.wisc.edu. [Accessed 19 Jan 2021]	"Lady's mantle should be planted with care as it can be invasive because of its abundant seed production." [Seed densities and numbers per plant have not been quantified]

802	**Evidence that a persistent propagule bank is formed (>1 yr)**	
	Source(s)	**Notes**

Qsn #	Question	Answer
	Thompson, K., Colsell, S., Carpenter, J., Smith, R. M., Warren, P. H., & Gaston, K. J. (2005). Urban domestic gardens (VII): a preliminary survey of soil seed banks. Seed Science Research, 15(2), 133-141	[Limited presence in seed bank. Longevity not reported] "As a predictor of presence in the seed bank, presence in the flora was very variable. Seeds of the shrubs Buddleja and Leycesteria, and the herbs Aquilegia vulgaris and Alchemilla mollis, were almost all confined to gardens in which the species were recorded in the flora, but seeds of Hypericum androsaemum, Betula pendula and Carex pendula were commonly found in gardens in which the species was absent (Table 3)."
	WRA Specialist. (2021). Personal Communication	Unable to find information on soil seed longevity

803	Well controlled by herbicides	
	Source(s)	**Notes**
	Nawrocki, T. (2011). lady's mantle Alchemilla mollis (Buser) Rothm. hairy lady's mantle Alchemilla monticola Opiz. Alaska Natural Heritage Program, University of Alaska, Anchorage	"Plants can be removed from gardens manually (Mahr 2010), taking care to remove all root fragments (Eom et al. 2005). However, control methods for lady's mantle are largely undocumented."
	Reddit. (2021). How to get rid of Alchemilla 'mollis - Lady's Mantle?? https://www.reddit.com. [Accessed 22 Jan 2021]	[Herbicides may be effective] "Cut back before it sets seed then apply a "systemic" herbicide which you apply to the leaves of the plant. It works its way down to the roots, killing the plant but not killing everything else in its wake (supposedly- and only if used correctly). It is a herbacious perennial which means that it will grow from pretty much any amount of root left in the ground, so while pulling it all up is effective short term it will most likely spring back- you can keep on pulling it out but it may take years."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	**Notes**
	Reddit. (2021). How to get rid of Alchemilla 'mollis - Lady's Mantle?? https://www.reddit.com. [Accessed 22 Jan 2021]	"Cut back before it sets seed then apply a "systemic" herbicide which you apply to the leaves of the plant. It works its way down to the roots, killing the plant but not killing everything else in its wake (supposedly- and only if used correctly). It is a herbacious perennial which means that it will grow from pretty much any amount of root left in the ground, so while pulling it all up is effective short term it will most likely spring back- you can keep on pulling it out but it may take years."
	Anisko, T. (2008). When Perennials Bloom: An Almanac for Planning and Planting. Timber Press, Portland, Oregon	"Flowering stems can be cut for fresh or dry arrangements. Otherwise, they can be cut back after flowering to better show the neat foliage, prevent self-seeding, and encourage a possibility of a sparse rebloom in late summer. Plants overwinter better when their leaves are not cut back."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	**Notes**
	WRA Specialist. (2021). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits
• Broad climate suitability
• Widely naturalized in western and central Europe (no evidence in Hawaiian Islands to date)
• A weedy plant of lawns, landscaping, disturbed sites, and possibly natural areas
• Other species are crop weeds.
• Unpalatable to deer, rabbits and possibly other browsing animals
• Shade tolerant
• Tolerates many soil types.
• Forms dense mounds that may compete with or inhibit other vegetation.
• Reproduces apomictically by seeds and vegetatively by rhizomes.
• Reaches maturity in 2 years.
• Dispersed as garden waste, intentionally by people, and possibly by water.
• Prolific seed production (numbers unquantified)
• May be able to resprout after cutting or damage.

Low Risk Traits
• A plant of temperate climates, may only be a threat at cooler, higher elevations of tropical islands.
• A popular garden plant that may be used to suppress other weedy plants.
• Unarmed (no spines, thorns, or burrs)
• Non-toxic