

Taxon: <i>Helichrysum petiolare</i> Hilliard & B. L. Burt	Family: Asteraceae
Common Name(s): licorice plant liquorice plant silver bush everlasting flower trailing dusty miller	Synonym(s): <i>Helichrysum petiolatum</i> auct.

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 13 Jan 2023
WRA Score: 10.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Aromatic Shrub, Environmental Weed, Deer-Resistant, Spreads Vegetatively, Wind-Dispersed

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)	Intermediate
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	n
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
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)	n
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)	y
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		
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

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
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	y=1, n=0	y
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	y=1, n=-1	y
604	Self-compatible or apomictic		
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)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	n
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/m ²)		
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
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	" <i>Helichrysum petiolare</i> occurs in the drier inland parts, sheltered slopes and forest margins of the Western Cape (Cederburg and Jonkershoek Mountains), Eastern Cape and KwaZulu-Natal." [No evidence of domestication]

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2023). 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"	Intermediate
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 12 Jan 2023]	"Native Africa SOUTHERN AFRICA: South Africa [Eastern Cape, Western Cape]"

202	Quality of climate match data	High
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 12 Jan 2023]	

Qsn #	Question	Answer
203	Broad climate suitability (environmental versatility)	n
	Source(s)	Notes
	Flora of North America. (2023). <i>Helichrysum petiolare</i> . http://www.efloras.org . [Accessed 12 Jan 2023]	"Shrubby plants forming a dense thicket on the slope of Bolinas Ridge above Stinson Beach" (J. T. Howell 1970); 300–600 m"
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	"Shrubby plants forming a dense thicket on the slope of Bolinas Ridge above Stinson Beach" (J. T. Howell 1970); 300–600 m"
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	"The species' known tolerances (mild winters and summers) indicate that it has the potential to invade along the California coast to a few miles inland, especially the south and central coast."

Qsn #	Question	Answer
204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 12 Jan 2023]	"Naturalized Africa MACARONESIA: Portugal [Madeira Islands] Europe NORTHERN EUROPE: United Kingdom EASTERN EUROPE: Ukraine SOUTHWESTERN EUROPE: Spain, France [Corse], Portugal Northern America SOUTHWESTERN U.S.A.: United States [California]" [Madeira generally has a very mild and moderate subtropical climate with mediterranean summer droughts and winter rain. Many microclimates are found at different elevations.]
	Tamaariki, J. (2023). BIISC Field Supervisor. Pers. Comm. 05 Jan	"We were working in Kaloko mauka last week doing some Phenax control when we spotted this plant and worked out that it is Licorice weed (<i>Helichrysum petiolare</i>). Seems it's invasive several places around the world, one of them being New Zealand. It was startling to see how large an area of the forest it has sprawled over in Kaloko." [Presumably naturalized or naturalizing on Hawaii island]

Qsn #	Question	Answer
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. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 12 Jan 2023]	"Cultivated (also cult.) Naturalized Africa MACARONESIA: Portugal [Madeira Islands] Europe NORTHERN EUROPE: United Kingdom EASTERN EUROPE: Ukraine SOUTHWESTERN EUROPE: Spain, France [Corse], Portugal Northern America SOUTHWESTERN U.S.A.: United States [California]"
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	" <i>Helichrysum petiolare</i> is one of the best known and the most commonly used helichrysums, easy to grow, with beautiful velvety silver foliage."

301	Naturalized beyond native range	y
	Source(s)	Notes
	Flora of North America. (2023). <i>Helichrysum petiolare</i> . http://www.efloras.org . [Accessed 11 Jan 2023]	"Flowering summer. "Shrubby plants forming a dense thicket on the slope of Bolinas Ridge above Stinson Beach" (J. T. Howell 1970); 300–600 m; introduced; Calif; s Africa (Cape region); introduced in Europe."
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	" <i>Helichrysum</i> has been reponed outside cultivation in four locations in California, all within a few miles of the ocean in Monterey, Marin, and Mendocino counties. The Monterey infestation is in the Del Monte Forest, the two Marin populations are within the Golden Gate National Recreation Area, and the Mendocino population is near Gualala (Howell 1969; Smith and Wheeler 1990). The plant invades coastal scrub communities but has the potential to invade coastal grasslands. It is sun-loving, and it is unlikely to tolerate much shade."
	Prunera-Olivé, J., Galbany-Casals, M., Cremades, J., & Fagúndez, J. (2019). A new hybrid between two alien <i>Helichrysum</i> species (Compositae, Gnaphalieae) from NW Spain. <i>Biological Invasions</i> , 21(5), 1481-1490	" <i>Helichrysum petiolare</i> has been introduced in USA, New Zealand, certain parts of Europe and Madeira Island (Galbany-Casals et al. in press). The species was first recorded as naturalized in the Iberian Peninsula in Portugal, in 1943 (Pinto da Silva 1956), and in 1974 in Galicia, at Tambo Island (Lai'nz 1974). At present, the species has colonized several sites in Galicia (Fagu'ndez and Barrada 2007). It grows in Eucalyptus plantations, coastal cliffs, margins of cultivated fields and road margins, but mainly in <i>Ulex europaeus</i> coastal scrub (Fagu'ndez and Barrada 2007; Mourin~o et al. 2012; Galbany-Casals et al. in press)."
	Heenan, P. B., de Lange, P. J., Cameron, E. K., & Champion, P. D. (2002). Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 199–2000. <i>New Zealand Journal of Botany</i> , 40(2): 155-174	"It is also disturbing that since 1988 several species that were then sporadic are now considered to have become much more widespread in urban and rural New Zealand, e.g., <i>Antenoron filiforme</i> and <i>Helichrysum petiolare</i> ."

Qsn #	Question	Answer
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 11 Jan 2023]	"Naturalized Africa MACARONESIA: Portugal [Madeira Islands] Europe NORTHERN EUROPE: United Kingdom EASTERN EUROPE: Ukraine SOUTHWESTERN EUROPE: Spain, France [Corse], Portugal Northern America SOUTHWESTERN U.S.A.: United States [California]"
	Tamaariki, J. (2023). BIISC Field Supervisor. Pers. Comm. 05 Jan	[Widely established and presumably naturalized on Hawaii Island] "We were working in Kaloko mauka last week doing some Phenax control when we spotted this plant and worked out that it is Licorice weed (<i>Helichrysum petiolare</i>). Seems it's invasive several places around the world, one of them being New Zealand. It was startling to see how large an area of the forest it has sprawled over in Kaloko."
	Imada, C. (2019). Hawaiian Naturalized Vascular Plants Checklist (February 2019 update). Bishop Museum Technical Report 69. Bishop Museum, Honolulu, HI	<i>Helichrysum foetidum</i> is the only species published as naturalized in the Hawaiian Islands as of 2019

302	Garden/amenity/disturbance weed	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	" <i>Helichrysum petiolare</i> can invade undisturbed sites, since it is penetrating an otherwise apparently healthy, dense California sagebrush-coyote brush scrub. It forms a closed canopy in places and displaces native plant species." [An ornamental that spreads in the absence of disturbance]

303	Agricultural/forestry/horticultural weed	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	" <i>Helichrysum petiolare</i> can invade undisturbed sites, since it is penetrating an otherwise apparently healthy, dense California sagebrush-coyote brush scrub. It forms a closed canopy in places and displaces native plant species." [Apparently impacts undisturbed natural areas]
	Randall, R.P. (2017). <i>A Global Compendium of Weeds</i> . 3rd Edition. Perth, Western Australia. R.P. Randall	No evidence

304	Environmental weed	y
	Source(s)	Notes
	Randall, J. M. (1997). Weed Alert!: New Invasive Weeds in California. California Exotic Pest Plant Council. 1997 Symposium Proceedings. 6 pp.	" <i>Helichrysum petiolare</i> was not included in the Jepson Manual, but Sigg's 1997 article in <i>CalEPPC News</i> brought renewed attention to the species. By this time the Mount Tamalpais population had spread to cover several acres, with scattered outliers, and there was another infestation roughly two miles southeast in Tennessee Valley on the Marin peninsula. It can apparently invade otherwise healthy <i>Baccharis-Artemisia</i> dominated communities and may be able to move into other shrubland and grassland community types along the state's northern and central coast (Sigg 1997)."

Qsn #	Question	Answer
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"The Stinson Beach infestation in Golden Gate National Recreation Area demonstrates that <i>Helichrysum petiolare</i> can invade undisturbed sites, since it is penetrating an otherwise apparently healthy, dense California sagebrush-coyote brush scrub. It forms a closed canopy in places and displaces native plant species."
	Cal-IPC. (2023). <i>Helichrysum petiolare</i> . https://www.cal-ipc.org/plants/profile/helichrysum-petiolare-profile/ . [Accessed 12 Jan 2023]	[Environmental weed. Impacts unquantified] "The extent of its impacts are unknown, but it can grow to form dense stands that may crowd out native plants. Licoriceplant has been growing outside of cultivation for several decades, but these naturalized populations do not appear to spread very rapidly."

305	Congeneric weed	y
	Source(s)	Notes
	Wells, M. J., Balsinhas, A. A., Joffe, H., Engelbrecht, V.M., Harding, G. & Stirton, C.H. (1986). A Catalogue of problem plants in Southern Africa. Botanical Research Institute, Republic of South Africa	[Fourteen species of <i>Helichrysum</i> listed as weeds. The following are a sample of some entries] " <i>Helichrysum anomalum</i> ... Kind of Weed: Ruderal (general), agrestal (general), pastoral (natural)? Undesirable Characteristics: Competitive (space, light, water, nutriment), replacing preferred vegetation (grass), unpalatable (relatively), contaminant (seed), highly inflammable (green)?, highly inflammable (dry)?" ... " <i>Helichrysum argyrophyllum</i> ... "Kind of Weed: Ruderal (general), pastoral (natural) Kind of Weed: Competitive (space, light, water, nutriment), replacing preferred vegetation (grass), unpalatable (relatively), highly inflammable (green), highly inflammable (dry)"

401	Produces spines, thorns or burrs	n
	Source(s)	Notes
	Flora of North America. (2023). <i>Helichrysum petiolare</i> . http://www.efloras.org . [Accessed 12 Jan 2023]	[No evidence] "Shrubs or subshrubs, aromatic, to 60 cm. Stems loosely branched, straggling. Leaves petiolate; blades ovate, 1–2 cm, apices obtuse to subacute, faces concolor, silvery green, woolly-tomentose. Phyllaries creamy white."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown. No evidence found.

403	Parasitic	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"Compositae. Perennial shrub to 3ft (1 m) high." [Asteraceae. No evidence]

404	Unpalatable to grazing animals	y
	Source(s)	Notes

Qsn #	Question	Answer
	Clausen, R. R. (2011). 50 Beautiful Deer-Resistant Plants. Timber Press, Portland, OR	[Unpalatable to deer] "Although no plant is completely deer-proof, certain generalizations can be made about plants that deer are likely to ignore. Fuzzy-leaved plants seem to be unpalatable to deer-the hairs on the leaves must be irritating to the tongue. Lamb's ears (<i>Stachys byzantina</i>), licorice plant (<i>Helichrysum petiolare</i>), and lady's mantle (<i>Alchemilla mol/</i> is) are good examples."

405	Toxic to animals	n
	Source(s)	Notes
	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
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	n
	Source(s)	Notes
	Missouri Botanical Garden. (2023). <i>Helichrysum petiolare</i> . http://www.missouribotanicalgarden.org . [Accessed 13 Jan 2023]	"Susceptible to root rot, particularly in poorly drained soils."
	Whipker, B. E., Garrett Owen, W., McCall, I. & Cleveland, B. (2014). Licorice Plant (<i>Helichrysum</i>): Disorder Diagnostics. e-GRO Alert 3(13): 1-10	"The plant is relatively pest free, but aphids, leafminers and whiteflies are possible. Disease wise, root rot (<i>Pythium</i>) can be problematic under cloudy conditions when the plants are overhead irrigated. Botrytis can occur on wet foliage during overcast conditions and in high humidity environments. As reported in e-GRO Alert 3.12, low pH induced micronutrient phytotoxicities can occur."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 13 Jan 2023]	"Uses. Ailments such as coughs, colds and infections are treated with this popular medicinal plant. The leaves are used by Rastafarians to make an infusion to treat asthma, chest problems and high blood pressure. The smoke of the burning leaves is inhaled as a pain reliever. The leaves are also widely used on wounds to prevent infection. The Khoikhoi used the leaves and flowers as bedding; campers still do the same today. Burning a mixture of <i>Helichrysum</i> and <i>Artemisia afra</i> leaves, makes a pleasant insect repellent. It is very effective at keeping flies and mosquitoes away."
	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. Used medicinally] "Leaves infusion for coughs, colds, wounds and infections, asthma, chest problems and high blood pressure; the smoke of the burning leaves is inhaled as a pain reliever."

408	Creates a fire hazard in natural ecosystems	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Cal-IPC. (2023). <i>Helichrysum petiolare</i> . https://www.cal-ipc.org/plants/profile/helichrysum-petiolare-profile/ . [Accessed 13 Jan 2023]	"The extent of its impacts are unknown, but it can grow to form dense stands that may crowd out native plants. Licoriceplant has been growing outside of cultivation for several decades, but these naturalized populations do not appear to spread very rapidly." [Not listed among impacts]
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	"The Stinson Beach infestation in Golden Gate National Recreation Area demonstrates that <i>Helichrysum petiolare</i> can invade undisturbed sites, since it is penetrating an otherwise apparently healthy, dense California sagebrush-coyote brush scrub. It forms a closed canopy in places and displaces native plant species." [Not listed as a fire promoting species in California]
	Mouriño, J., Fagúndez, J., & Bernárdez, G. (2012). Distribution and invasiveness of the alien plant <i>Helichrysum petiolare</i> Hilliard & BL Burt (Asteraceae) in Northwest Iberian Peninsula. Poster presentation In NEOBIOA 7th European conference on biological invasions	[Reported to invade burned areas. Not identified as a fire hazard] "Moreover, the species presents a high capacity to post-fire regeneration. Seedling emergence has been observed in scrub clearings (see photo). We conclude that, although the invaded area is relatively narrow <i>Helichrysum. petiolare</i> is a strong invader in our studied region that interacts with natural habitats and human economic and social activities such as forest practices and wildfires. Deeper studies are needed and control plans for the species should be implemented."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 13 Jan 2023]	"Aspect: Full Sun, Morning Sun (Semi Shade), Afternoon Sun (Semi Shade)"
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	"It is sun-loving, and it is unlikely to tolerate much shade."
	Missouri Botanical Garden. (2023). <i>Helichrysum petiolare</i> . http://www.missouribotanicalgarden.org . [Accessed 13 Jan 2023]	"Sun: Full sun to part shade"

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y
	Source(s)	Notes
	Missouri Botanical Garden. (2023). <i>Helichrysum petiolare</i> . http://www.missouribotanicalgarden.org . [Accessed 13 Jan 2023]	"It is easily grown in average, dry to medium, well-drained soils in full sun to part shade. Tolerates poor soils. Superior soil drainage is the key to growing this plant well."
	Gardenia. (2023). <i>Helichrysum petiolare</i> (Licorice Plant). https://www.gardenia.net/plant/helichrysum-petiolare-limelight . [Accessed 13 Jan 2023]	"Soil Type Clay, Loam, Sand Soil pH Acid, Alkaline, Neutral Soil Drainage Moist but Well-Drained, Well-Drained"
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 13 Jan 2023]	"Soil type: Sandy, Loam"

411	Climbing or smothering growth habit	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Flora of North America. (2023). <i>Helichrysum petiolare</i> . http://www.efloras.org . [Accessed 12 Jan 2023]	"Shrubs or subshrubs, aromatic, to 60 cm. Stems loosely branched, straggling."
412	Forms dense thickets	y
	Source(s)	Notes
	Cal-IPC. (2023). <i>Helichrysum petiolare</i> . https://www.cal-ipc.org/plants/profile/helichrysum-petiolare-profile/ . [Accessed 11 Jan 2023]	"The extent of its impacts are unknown, but it can grow to form dense stands that may crowd out native plants. Licoriceplant has been growing outside of cultivation for several decades, but these naturalized populations do not appear to spread very rapidly."
501	Aquatic	n
	Source(s)	Notes
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	[Terrestrial] " <i>Helichrysum petiolare</i> occurs in the drier inland parts, sheltered slopes and forest margins of the Western Cape (Cederburg and Jonkershoek Mountains), Eastern Cape and KwaZulu-Natal."
502	Grass	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 12 Jan 2023]	"Family: Asteraceae (alt. Compositae) Subfamily: Asteroideae Tribe: Gnaphalieae"
503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	USDA, Agricultural Research Service, National Plant Germplasm System. (2023). Germplasm Resources Information Network (GRIN-Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.ars-grin.gov/ . [Accessed 12 Jan 2023]	"Family: Asteraceae (alt. Compositae) Subfamily: Asteroideae Tribe: Gnaphalieae"
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Flora of North America. (2023). <i>Helichrysum petiolare</i> . http://www.efloras.org . [Accessed 12 Jan 2023]	"Shrubs or subshrubs, aromatic, to 60 cm. Stems loosely branched, straggling."

Qsn #	Question	Answer
601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	"Conservation Status - <i>Helichrysum petiolare</i> , is not threatened."

602	Produces viable seed	y
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	" <i>Helichrysum petiolare</i> spreads vegetatively and by seed. Flowering is in mid-summer, and abundant seed is produced by early autumn."
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 13 Jan 2023]	"This plant can be propagated from cuttings or from seed sown in autumn (March)."

603	Hybridizes naturally	y
	Source(s)	Notes
	Prunera-Olivé, J., Galbany-Casals, M., Cremades, J., & Fagúndez, J. (2019). A new hybrid between two alien <i>Helichrysum</i> species (Compositae, Gnaphalieae) from NW Spain. <i>Biological Invasions</i> , 21(5), 1481-1490	"Abstract Hybridisation events between Invasive Alien Species can contribute to the acquisition of novel traits or a higher fitness through gene exchange and, in consequence, facilitate the adaptation to new environments and the colonization of new territories. Using morphological data and DNA sequences, we have identified and described a new hybrid between <i>Helichrysum petiolare</i> and <i>H. foetidum</i> . Both species are original to South Africa, but have become invasive in the coast of Galicia, NW Spain. The hybrids were raised in the laboratory from achenes collected from <i>H. petiolare</i> in isolated populations far from the core invaded area, but have so far not been found in the wild. Up to now, there is no evidence that the hybrids are themselves fertile. We consider that the risk assessment for these invasive species must take into account the potential crosses in natural areas, a phenomenon with implications in the species capacity to affect the invaded habitats."

604	Self-compatible or apomictic	
	Source(s)	Notes
	Missouri Botanical Garden. (2023). <i>Helichrysum petiolare</i> . http://www.missouribotanicalgarden.org . [Accessed 13 Jan 2023]	"Plants may self-seed in optimum growing conditions, but many of the cultivars will not come true from seed." [Unknown if plants are outcrossing or selfing to produce seeds]
	East, E. M. (1940). The distribution of self-sterility in the flowering plants. <i>Proceedings of the American Philosophical Society</i> 82: 449-518	"There is no safe information at hand about the large and varied tribe Inuleae. I have heard that some of the cultivated forms belonging to the genera <i>Helichrysum</i> and <i>Inula</i> are self-fertile, but no satisfactory evidence is available."

605	Requires specialist pollinators	n
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Qsn #	Question	Answer
	Source(s)	Notes
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	"The honey-scented flowers attract a variety of pollinating insects, including honeybees."
	Flora of North America. (2023). <i>Helichrysum petiolare</i> . http://www.efloras.org . [Accessed]	[Generic description. No evidence] "Heads disciform or discoid, in glomerules in corymbiform arrays. Involucre campanulate, 4–8 mm. Phyllaries in 3–5[–7] series, whitish [stramineous, orange, reddish, or pinkish] (opaque or hyaline, usually shiny; stereomes green, usually sessile-glandular distally). Receptacles flat, glabrous, epaleate. Peripheral (pistillate) florets 0 or 1–2 (fewer than bisexual): corollas yellowish. Inner (bisexual) florets 3–30[–50+]; corollas usually yellowish. "

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	"Vegetative propagation may be an important means of spreading because branches can root if in contact with the ground." ... "Its branches are lax and sprawling, and those touching ground will take root, hence vegetative propagation may be an important means of spread in California."

607	Minimum generative time (years)	2
	Source(s)	Notes
	Loewer, P. (2015). <i>Solving Deer Problems: How to Deerproof Your Yard and Garden</i> . Skyhorse Publishing, Inc., New York	"Licorice plant or vine (<i>Helichrysum petiolare</i>) bears insignificant umbel of white flower but does, sport elegant, silvery leaves that are great in containers- especially because they spill over the container edge like lazy vines inclined to flop rather than climb-and as edgings for borders. 'Lemon Licorice) has leaves colored chartreuse. Its not a true annual but a tropical shrub that blooms the first year from seed."
	Missouri Botanical Garden. (2023). <i>Helichrysum petiolare</i> . http://www.missouribotanicalgarden.org . [Accessed 13 Jan 2023]	"Suggested Use: Annual" ... "When grown as annuals, plants generally grow to 6-9" tall and usually will not flower. Overwintered plants may flower the second year. Tiny white flowers, if and when they do bloom, are insignificant and often removed by gardeners as they appear."

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	"Vegetative propagation may be an important means of spreading because branches can root if in contact with the ground. Seeds are wind-dispersed, but they generally do not carry long distances." [No means of external attachment. External dispersal may occur if seeds or root fragments are moved in soil attached to vehicles, equipment, or footwear, but direct evidence is lacking]

Qsn #	Question	Answer
	Prunera-Olivé, J., Galbany-Casals, M., Cremades, J., & Fagúndez, J. (2019). A new hybrid between two alien <i>Helichrysum</i> species (Compositae, Gnaphalieae) from NW Spain. <i>Biological Invasions</i> , 21(5), 1481-1490	[Establishment along road margins suggests inadvertent transport by human activities may be occurring] "It grows in Eucalyptus plantations, coastal cliffs, margins of cultivated fields and road margins, but mainly in <i>Ulex europaeus</i> coastal scrub (Fagúndez and Barrada 2007; Mourin et al. 2012; Galbany-Casals et al. in press)."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Randall, J. M. (1997). <i>Weed Alert!: New Invasive Weeds in California</i> . California Exotic Pest Plant Council. 1997 Symposium Proceedings. 6 pp.	" <i>Helichrysum petiolare</i> is a low shrub native to coastal South Africa in the Inulae (everlasting) tribe of the composite family (Asteraceae). It has aromatic leaves about the size and shape of nickels or dimes (Sigg 1997). They are so densely matted with hair that the plants look white, somewhat like a native sage (<i>Salvia</i> spp.). It has many small, clustered flowerheads which resemble those of native cudweeds and everlastings (<i>Gnaphalium</i> spp.). The plants are attractive and have been sold in specialty nurseries at least since the 1960s."
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 12 Jan 2023]	" <i>Helichrysum petiolare</i> is one of the best known and the most commonly used <i>helichrysums</i> , easy to grow, with beautiful velvety silver foliage."

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Heenan, P. B., de Lange, P. J., Cameron, E. K., & Champion, P. D. (2002). Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 199–2000. <i>New Zealand Journal of Botany</i> , 40(2): 155-174	[Dispersed as garden refuse] "Previous records (Webb et al. 1995; Heenan et al. 1999) of <i>H. petiolare</i> have involved situations where this species has been sparingly naturalised, presumably from garden refuse and usually in the vicinity of established garden plants. However, at Motutangi, Northland, numerous seedlings, young plants, and adults grow along a 1-km stretch of roadside (Fig. 2)."

704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). <i>Invasive Plants of California's Wildlands</i> . University of California Press, Berkeley and Los Angeles, CA	"Seeds are wind-dispersed, but they generally do not carry long distances."
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 13 Jan 2023]	"The seeds are small, lightweight, with tuft of bristly hairs at one end, and are dispersed by wind."

705	Propagules water dispersed	n
	Source(s)	Notes
	Oliver, R. (2019). <i>Helichrysum petiolare</i> . PlantZAfrica. SANBI. https://pza.sanbi.org/helichrysum-petiolare . [Accessed 13 Jan 2023]	" <i>Helichrysum petiolare</i> occurs in the drier inland parts, sheltered slopes and forest margins of the Western Cape (Cederburg and Jonkershoek Mountains), Eastern Cape and KwaZulu-Natal." [Unlikely. Not reported to naturally occur in proximity to aquatic habitats.]

Qsn #	Question	Answer
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"Vegetative propagation may be an important means of spreading because branches can root if in contact with the ground. Seeds are wind-dispersed, but they generally do not carry long distances." [Possibly if occurring in riparian areas, but not reported to frequently occur in or invade riparian habitats]

706	Propagules bird dispersed	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"Seeds are wind-dispersed, but they generally do not carry long distances."

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"Seeds are wind-dispersed, but they generally do not carry long distances."

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"Seeds are wind-dispersed, but they generally do not carry long distances." [No evidence of consumption or internal dispersal]

801	Prolific seed production (>1000/m2)	n
	Source(s)	Notes
	Fourie, S. (2008). Composition of the soil seed bank in alien-invaded grassy fynbos: potential for recovery after clearing. South African Journal of Botany, 74(3), 445-453	"Table 1 Seed density of the 10 most dominant indigenous species for each zone" [Helichrysum petiolare recorded at densities of up to 138±47]
	Boyce, R. L. (2009). Invasive shrubs and forest tree regeneration. Journal of Sustainable Forestry, 28(1-2), 152-217	[Heavy seed crop reported, but densities unquantified] "TABLE 4 Reproduction Characteristics of Invasive Shrub Species." [Helichrysum petiolare - Seed reproduction = Heavy seed crop]

802	Evidence that a persistent propagule bank is formed (>1 yr)	n
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"Flowering is in mid-summer, and abundant seed is produced by early autumn; seed longevity is not known."

803	Well controlled by herbicides	n
	Source(s)	Notes

Qsn #	Question	Answer
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"HOW CAN I GET RID OF IT? There have been no reported efforts to control <i>Helichrysum petiolare</i> . Small infestations are easily removed by hand pulling. For large patches, it will be necessary to experiment with an herbicidal application. The dense woolly hairs protecting the leaves may inhibit absorption of many herbicides. A certified herbicide applicator should be able to assist in selection of an effective surfactant. It is not known whether this species is adapted to regenerate from seed or root crowns following fire."

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	Bossard, C. C., Randall, J. M. & Hoshovsky, M. C. (2000). Invasive Plants of California's Wildlands. University of California Press, Berkeley and Los Angeles, CA	"There have been no reported efforts to control <i>Helichrysum petiolare</i> . Small infestations are easily removed by hand pulling. For large patches, it will be necessary to experiment with an herbicidal application. The dense woolly hairs protecting the leaves may inhibit absorption of many herbicides. A certified herbicide applicator should be able to assist in selection of an effective surfactant. It is not known whether this species is adapted to regenerate from seed or root crowns following fire."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2023). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Can grow and spread in regions with Mediterranean to subtropical climates.
- A South African native naturalized in regions of Europe, North America, New Zealand, and established and apparently naturalized on Hawaii Island
- A weed of natural areas in California, capable of invading undisturbed scrub and displacing native species
- Other *Helichrysum* species are invasive weeds.
- Unpalatable to deer and probably other browsing animals
- Tolerates many soil types.
- Reported to form dense stands.
- Reproduces by seeds and vegetatively by rooting stems.
- Hybridizes with other *Helichrysum* species.
- Reported to reach reproductive maturity in 2 years.
- Seeds dispersed by wind, and through intentional cultivation.
- Vegetative fragments spread in dumped garden waste.
- Reported to produce large numbers of seeds.
- May be able to establish after fire (from seed)

Low Risk Traits

- Although invading natural areas in California, reported to spread slowly, and impacts on native ecosystems have not been quantified.
- Unarmed (no spines, thorns, or burrs)
- No confirmed reports of toxicity (although a few websites claim it is poisonous)
- Grows best in high light environments (dense shade may inhibit spread)