

Australia/New Zealand Weed Risk Assessment adapted for Florida.

Data used for analysis published in: Gordon, D.R., D.A. Onderdonk, A.M. Fox, R.K. Stocker, and C. Gantz. 2008. Predicting Invasive Plants in Florida using the Australian Weed Risk Assessment. Invasive Plant Science and Management 1: 178-195.

<i>Helianthus argophyllus (silverleaf sunflower)</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to Florida's USDA climate zones (0-low; 1-intermediate; 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)		
2.04	Native or naturalized in habitats with periodic inundation		
2.05	Does the species have a history of repeated introductions outside its natural range?	y	
3.01	Naturalized beyond native range	y	0
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	0
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic	n	0
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems	n	0
4.09	Is a shade tolerant plant at some stage of its life cycle	n	0
4.1	Grows on infertile soils (oligotrophic, limerock, or excessively draining soils)	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets	n	0
5.01	Aquatic	n	0

5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat		
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	y	1
6.04	Self-compatible or apomictic	n	-1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative fragmentation	n	-1
6.07	Minimum generative time (years)	1	1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed	n	-1
7.06	Propagules bird dispersed	?	
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in Florida, or east of the continental divide		
Total Score			3

Outcome	Accept*
----------------	----------------

*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. *Conserv. Biol.* 18: 360-368.

section	# questions answered	satisfy minimum?
A	6	yes
B	10	yes
C	15	yes
total	31	yes

Data collected 2006-2007

Question number	Reference	Source data
1.01		cultivated, but no evidence of selection for reduced weediness
1.02		
1.03		
2.01		
2.02		
2.03		
2.04		
2.05	1. Smith (1991) Flora Vitiensis Nova: A New Flora of Fiji. Vol. 5. Pacific Tropical Botanical Garden. 2. Heiser (1951) Hybridization in the annual sunflowers: <i>Helianthus annuus</i> x <i>H. argophyllus</i> . The American Naturalist 85: 65-72.	1. Used as an ornamental in Fiji and cultivated elsewhere. 2. "It has been known in cultivation as the 'silver leaf sunflower' since 1889".
3.01	1. Faure, Serieys, and Berville (2002) Potential gene flow from cultivated sunflower to volunteer, wild <i>Helianthus</i> species in Europe. Agriculture, Ecosystems and Environment 89: 183-190. 2. Hnatiuk (1990) Census of Australian Vascular Plants. Australian Flora and Fauna Series no. 11. AGPS Press, Canberra.	1. " <i>H. argophyllus</i> and <i>H. petiolaris</i> have now spread to other countries (Mozambique, China, Australia) and become established as weedy species". 2. <i>H. argophyllus</i> considered naturalized in Queensland, Australia.
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	Weber (2003) Invasive Plant Species of the World. CABI Publishing.	<i>H. tuberosus</i> is considered an environmental weed in parts of Europe.
4.01	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	no description of these traits
4.02		no evidence
4.03	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-	no description of this

	218.	
4.04		
4.05		no evidence
4.06		
4.07		no evidence
4.08		no evidence
4.09	Huxley (1992) The New Royal Horticultural Society Dictionary of Gardening. The MacMillan Press, London.	"Grow in full sun"
4.1	Heiser (1951) Hybridization in the annual sunflowers: <i>Helianthus annuus</i> x <i>H. argophyllus</i> . The American Naturalist 85: 65-72.	"In Texas it is found only in or near the southern coast in regions of sandy soil."
4.11	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	growth habit: forb/herb
4.12		no evidence
5.01		terrestrial
5.02	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	Asteraceae
5.03	USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA.	herbaceous Asteraceae
5.04	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	annual (1, 2)
6.01		
6.02	Huxley (1992) The New Royal Horticultural Society Dictionary of Gardening. The MacMillan Press, London.	propagate by seed
6.03	Heiser (1951) Hybridization in the annual sunflowers: <i>Helianthus annuus</i> x <i>H. argophyllus</i> . The American Naturalist 85: 65-72.	" <i>Helianthus annuus</i> and <i>H. argophyllus</i> are closely related species and natural hybrids between the two have been found in Texas."
6.04	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	"With the exception of <i>H. agrestis</i> and certain cultivated strains of <i>H. annuus</i> , all species of <i>Helianthus</i> are self-incompatible and cross pollination is obligate."

6.05	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	"from observations in the field and in the experimental garden it is obvious that bees, including the honey bee, are the principal pollinators [of the genus <i>Helianthus</i>]"
6.06	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	annual (1, 2) [and no evidence of vegetative reproduction]
6.07	1. USDA, NRCS. 2005. The PLANTS Database, Version 3.5 (http://plants.usda.gov). Data compiled from various sources by Mark W. Skinner. National Plant Data Center, Baton Rouge, LA 70874-4490 USA. 2. Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	annual (1, 2)
7.01		
7.02	1. Smith (1991) Flora Vitiensis Nova: A New Flora of Fiji. Vol. 5. Pacific Tropical Botanical Garden. 2. Heiser (1951) Hybridization in the annual sunflowers: <i>Helianthus annuus</i> x <i>H. argophyllus</i> . The American Naturalist 85: 65-72.	1. Used as an ornamental in Fiji and cultivated elsewhere. 2. "It has been known in cultivation as the 'silver leaf sunflower' since 1889".
7.03		no evidence
7.04	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	"In <i>Helianthus</i> the pappus in most species is readily deciduous at maturity of the seed, thus it does not aid in any obvious manner in seed dispersal; and even if it were persistent, it would probably not serve as a particularly effective means of seed dispersal."
7.05		no evidence
7.06	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	"Before man appeared on the scene probably both birds and small mammals were important agents in dispersal, for sunflower seeds are an attractive food to both groups. Some birds in visiting mature sunflower heads may scatter achenes. Most birds to my knowledge crack sunflower achenes before eating them but it is possible that some are eaten whole and may pass through the digestive system unharmed...it seems likely that sunflower seed dispersal is probably highly localized and it is unlikely that long-distance dispersal has been

		involved in extending the distributions of most of the species."
7.07	Heiser, Smith, Clevenger, and Martin (1969) The North American sunflowers (<i>Helianthus</i>). Memoirs of the Torrey Botanical Club 22: 1-218.	fruit a somewhat flattened obovate achene, 4-6 mm long [no evidence of any means of attachment]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		