United States Department of Agriculture

Weed Risk Assessment for *Mimosa pudica* L. (Fabaceae) – Sensitive plant

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Animal and Plant Health Inspection Service

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Version 1

Dried pods (top), plant habit (bottom), flower, leaves, and stem of *M. pudica* (right). [Photo source: top and bottom Starr and Starr (2005-2009), and right, K. A. Rawlins, invasive.org].

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Introduction Plant Protection and Quarantine (PPQ) regulates noxious weeds under the authority of the Plant Protection Act (7 U.S.C. § 7701-7786, 2000) and the Federal Seed Act (7 U.S.C. § 1581-1610, 1939). A noxious weed is defined as "any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment" (7 U.S.C. § 7701-7786, 2000). We use weed risk assessment (WRA)—specifically, the PPQ WRA model (Koop et al., 2012)—to evaluate the risk potential of plants, including those newly detected in the United States, those proposed for import, and those emerging as weeds elsewhere in the world.

Because the PPQ WRA model is geographically and climatically neutral, it can be used to evaluate the baseline invasive/weed potential of any plant species for the entire United States or for any area within it. As part of this analysis, we use a stochastic simulation to evaluate how much the uncertainty associated with the analysis affects the model outcomes. We also use GIS overlays to evaluate those areas of the United States that may be suitable for the establishment of the plant. For more information on the PPQ WRA process, please refer to the document, *Background information on the PPQ Weed Risk Assessment*, which is available upon request.

Mimosa pudica L. – Sensitive Plant

Species Information

Family: Fabaceae

Synonyms: *Mimosa andreana* Britton & Rose, *M. endymionis* Martius, *M. hirsuta* Moçiño & Sessé y Lacasta ex G. Don, Gen., *M. hispidula* Kunth, *M. irritabilis* C. Presl, *M. pudibunda* Willdenow, *M. pudica* var. *glabrata* de Candolle, *M. pudica* var. *hispida* Brenan, *M. pudica*, var. *pastoris* Barneby, *M. pudica* var. *tetranda* (Humb. & Bonpl. ex Willd.) DC., *M. pudica* var. *unijuga* (Duchass. & Walp.) Griseb.), *M. tetrandra* Humb. & Bonpl. ex Willd., *M. unijuga* Duch. & Walp. (Francis, 2009; MBG, 2014; Wunderlin and Hansen, 2008). Additional synonyms are listed by Wunderlin and Hansen (2008).

Common names: Sensitive plant, common sensitive plant, touch-me-not, dormidera (Francis, 2009). Known by many other names in different languages (see Francis, 2009; GISD, 2010; PIER, 2013).

Botanical description: *Mimosa pudica* is a low-sprawling prickly herbaceous shrub or woody herb from 15 to 50 cm high (Barneby, 1991; Francis, 2009; Parsons and Cuthbertson, 2001; Holm et al., 1977; Woodson and Schery, 1950). It produces a 1- to 5-seeded fruit pod, edged with prickles and born in clusters (Parsons and Cuthbertson, 2001). The flowers are pink and clustered in globose heads (Francis, 2009). When the leaves of *M. pudica* are touched, it quickly folds its leaflets (Francis, 2009). Refer to the following references for a detailed botanical description of the

taxon: Barneby, 1991; Woodson and Schery, 1950.

Initiation: APHIS received a market access request from South Africa for corn seeds for planting in the United States (South Africa Department of Agriculture Forestry and Fisheries, 2012). During the development of that commodity risk analysis, *M. pudica* was identified as a weed of potential concern to the United States. The PPQ Weeds Cross Functional Working Group requested that PERAL evaluate this species with a weed risk assessment.

Foreign distribution: *Mimosa pudica* is native to tropical America (Holm et al., 1977) from southern Mexico to middle South America (Woodson and Schery, 1950), and the Caribbean (CABI, 2014). It has been widely introduced around the world and now has a pan-tropical distribution (Holm et al., 1977), including parts of Africa, Southeast Asia, Australia, and the South Pacific (CABI, 2014).

U.S. distribution and status: *Mimosa pudica* is naturalized in Hawaii (Imada, 2012). It has also been reported in the Southeastern United States (Reed, 1964; Wunderlin and Hansen, 2008) but its exact status there is not clear. Some records suggest it may be naturalized (Elias, 1974), but others indicate it is rare to perhaps occurring only as a waif (Weakley, 2010). *Mimosa pudica* is cultivated to some extent in the United States as a curiosity plant due to its highly touch-sensitive leaves, and has been reported as a weed in Texas and Louisiana (Dave's Garden, 2000-2014). The seeds of *M. pudica* are traded in the United States (Amazon.com, 2014; CBSC, 2014).

WRA area[1]: Entire United States, including territories.

1. *Mimosa pudica* analysis

Establishment/Spread Potential

Mimosa pudica is a perennial plant in warm regions of the world and is often cultivated as an annual in temperate regions (Holm et al., 1977). It has been widely introduced and is now considered a pan-tropical species (Holm et al., 1977). It is widely cultivated as a curiosity due to its highly touch-sensitive leaves (Davis and Johnson, n.d.; Dave's Garden, 2000-2014). *Mimosa pudica* requires disturbed soils to establish (Francis, 2009), and it grows in full sun or light shade; it is intolerant of heavy shade (Anonymous, 2006; Francis, 2009). It reproduces only by seed (Parsons and Cuthbertson, 2001). Its pods have stiff marginal bristles, which can attach to wool, fur, and clothing, allowing its dispersal by animals or people (Parsons and Cuthbertson, 2001). Seeds are also dispersed by water (Parsons and Cuthbertson, 2001) as a contaminant in soil and unspecified agricultural produce (UQ, 2011), and as a contaminant of cocopeat, which is used by the nursery industry (James et al., 2011). *Mimosa pudica* tolerates mowing and

[1] "WRA area" is the area in relation to which the weed risk assessment is conducted [definition modified from that for "PRA area"] (IPPC, 2012).

burning, and repeated burning may promote its spread in pastures (CABI, 2014; Francis, 2009). We had low uncertainty in this risk element.
Risk score = 17 Uncertainty index = 0.11

Impact Potential *Mimosa pudica* is most commonly reported as a weed of pastures (CABI, 2014), lawns (Dave's Garden, 2000-2014; Urban Forest, 2014), and several crops, including maize, sugarcane, rubber, tea, sorghum, soybeans, and upland rice (Parsons and Cuthbertson, 2001). In Queensland, Australia, it is regarded more as a nuisance than a serious weed (Parsons and Cuthbertson, 2001). In contrast, in Fiji it is highly regarded as a forage plant for dairy production (Holm et al., 1977). Cattle and sheep accept and graze on *M. pudica* (Wahab, 2001; Simonnet, 1990). Although seeds and other plant parts of *M. pudica* contain mimosine, an amino acid that can cause hair loss and depressed growth in mammals (in Francis, 2009), we found no significant evidence of animal impacts. Francis (2009) reports that a large dose is necessary to cause problems. While farm practices keep *M. pudica* under control in arable land, chemical control is more appropriate in grazing areas and plantation crops (Parsons and Cuthbertson, 2001). We had an average level of uncertainty in this risk element.
Risk score = 2.9 Uncertainty index = 0.20

Geographic Potential Based on three climatic variables, we estimate that about 22 percent of the United States is suitable for the establishment of *Mimosa pudica* (Fig. 1). This predicted distribution is based on the species' known distribution elsewhere in the world and includes point-referenced localities and areas of occurrence. The map for *M. pudica* represents the joint distribution of Plant Hardiness Zones 7-13, areas with 10-100+ inches of annual precipitation, and the following Köppen-Geiger climate classes: tropical rainforest, tropical savanna, humid subtropical, and marine west coast.

The area estimated likely represents a conservative estimate as it only uses three climatic variables. Other environmental variables, such as soil and habitat type, may further limit the areas in which this species is likely to establish. *Mimosa pudica* occurs mainly in highly disturbed systems, like croplands, orchards, pastures, roadsides, home gardens, lawns, construction sites, and waste places close to urban areas (Anonymous, 2013a; Francis, 2009; Parsons and Cuthbertson, 2001).

Entry Potential We did not assess the entry potential of *Mimosa pudica* because it is already present in the United States (Imada, 2012; Reed, 1964; Wunderlin and Hansen, 2008).

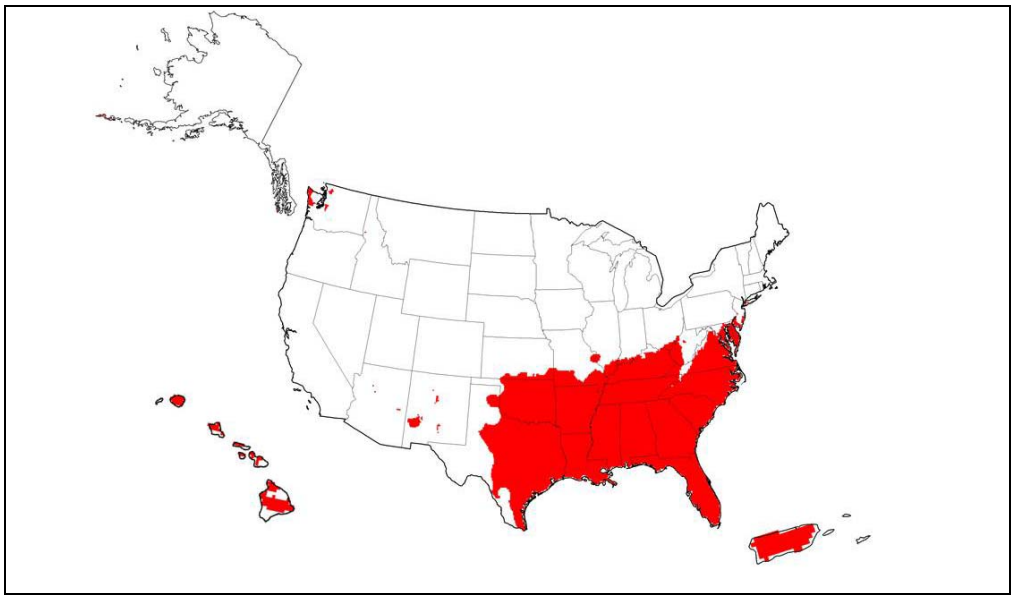

Figure 1. Predicted distribution of *Mimosa pudica* in the United States. Map insets for Alaska, Hawaii, and Puerto Rico are not to scale.

2. Results and Conclusion

Model Probabilities: P(Major Invader) = 83.4%
P(Minor Invader) = 16%
P(Non-Invader) = 0.6%

Risk Result = High Risk

Secondary Screening = Not applicable

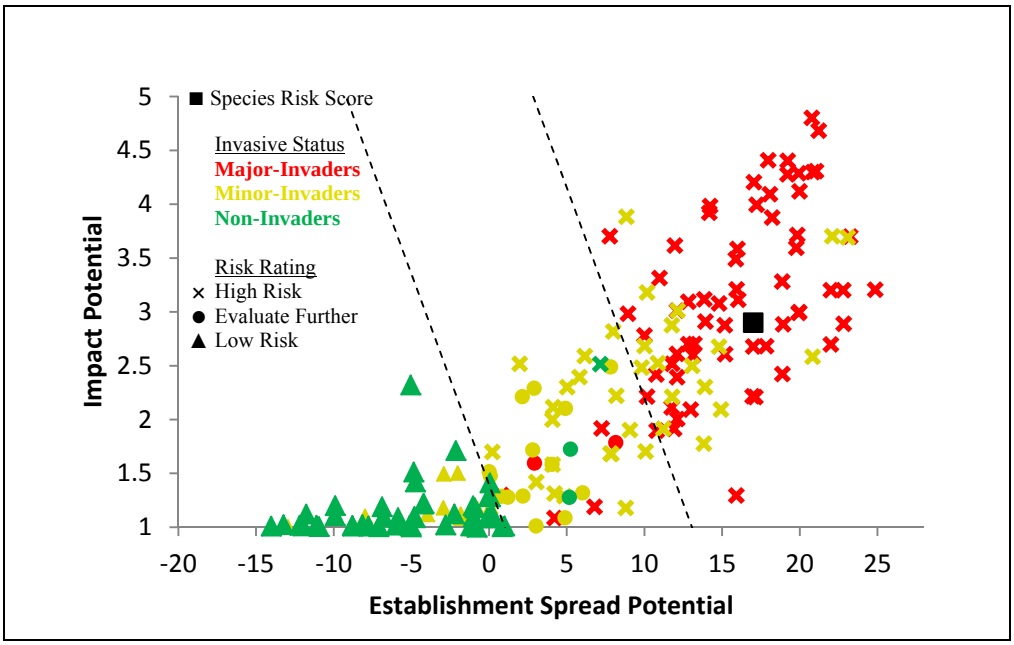

Figure 2. *Mimosa pudica* risk score (black box) relative to the risk scores of species used to develop and validate the PPQ WRA model (other symbols). See Appendix A for the complete assessment.

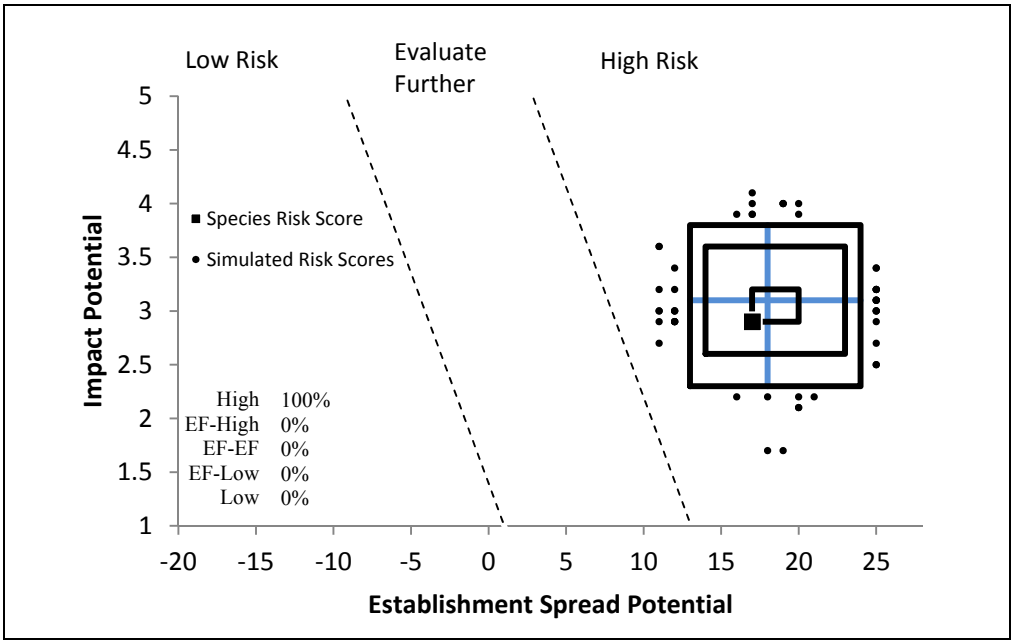

Figure 3. Model simulation results (N=5,000) for uncertainty around the risk score for *Mimosa pudica.* The blue "+" symbol represents the medians of the simulated outcomes. The smallest box contains 50 percent of the outcomes, the second 95 percent, and the largest 99 percent.

3. Discussion

The result of the weed risk assessment for *M. pudica* is High Risk (Fig. 2). Overall, we had low uncertainty and our conclusion was well supported by the results of the uncertainty simulation (Fig. 3). Thus, even if some of the answers in the assessment were to change based on new evidence, the result of the assessment is likely to still be High Risk. An evaluation of *M. pudica* with the Australian Weed Risk Assessment gave similar conclusions (Gordon et al., 2008; Gordon, 2010).

It is not clear how widespread *M. pudica* is in the continental United States. Anecdotal information (Dave's Garden, 2000-2014; Elias, 1974; Rawlins, 2009) suggests that *M. pudica* has a wider U.S. distribution than herbarium records indicate (e.g., Wunderlin and Hansen, 2008). However, this plant is limited to highly disturbed areas (Francis, 2009). Managers should be aware that because *M. pudica* is a curiosity plant due to its highly touch-sensitive leaves, seeds are commercially available (Amazon.com, 2014; CBSC, 2014) and traded by plant enthusiasts (Dave's Garden, 2000-2014) in the United States.

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Appendix A. Weed risk assessment for *Mimosa pudica* L. (Fabaceae). The following information came from the original risk assessment, which is available upon request (full responses and all guidance). We modified the information to fit on the page.

Question ID	Answer - Uncertainty	Score	Notes (and references)
ESTABLISHMENT/SPREAD POTENTIAL			
ES-1 (Status/invasiveness outside its native range)	f - negl	5	*Mimosa pudica* is native to tropical America (Holm et al., 1977) from southern Mexico to middle South America (Woodson and Schery, 1950), and the Caribbean (CABI, 2014). It has been widely introduced and is now pan-tropical (Holm et al., 1977). *Mimosa pudica* L. var. *unijuga* (Duchass. & Walp.) Griseb. is naturalized in the Hawaiian Islands of Nihau, Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii (Imada, 2012). In American Samoa, it is a "widespread weedy species" (Space and Flynn, 2000). "The sensitive plant is widely distributed in the tropics, ... invading forestry plantations, croplands, orchards and pastures throughout the tropics, especially in South Asia, the Pacific Islands and some African countries" (Davis and Johnson, n.d.). Alternate answers for the Monte Carlo simulation are both "e."
ES-2 (Is the species highly domesticated)	n - low	0	*Mimosa pudica* is often grown as an annual (Holm et al., 1977). "The sensitive plant is popular in cultivation around the world, and is enjoyed by many as a curiosity due to its highly touch-sensitive leaves" (Davis and Johnson, n.d.). "*M[imosa] pudica* var. *hispida*, which originates from southwest Mexico, is the most popularly cultivated variety" (Davis and Johnson, n.d.). "*Mimosa pudica* has been used widely in traditional medicine" in Republic of the Congo, Senegal, India (Davis and Johnson, n.d.). However, we found no evidence that it has been bred for any particular traits resulting in reduced weed potential.
ES-3 (Weedy congeners)	y - negl	1	The genus *Mimosa* contains 510 species (Mabberley, 2008). A few dozen of these species are considered weeds (Randall, 2012). *Mimosa invisa* (syn. *M. diplotricha*) and *M. pigra* are listed as U.S. Federal Noxious Weeds (7 CFR § 360, 2013).
ES-4 (Shade tolerant at some stage of its life cycle)	n - high	0	We found conflicting evidence regarding the shade tolerance of this plant. One source stated it can stand considerable shading (Holm et al., 1977; see references therein), and another categorized it as a high-shade tolerant legume (Shelton et al., 1987). In contrast, other sources characterized it as "shade intolerant and does not compete with tall vegetation or grow under forest canopies" (Francis, 2009), and "Full sun or light shade, intolerant of heavy shade" (Anonymous, 2006). Based on those descriptions, the species' overall habitat (primarily open disturbed areas) (Francis, 2009), and its cultivation requirements (full sun) (Page and Olds, 2001), we answered no.
ES-5 (Climbing or smothering growth form)	n - negl	0	*Mimosa pudica* is not a vine and does not form rosettes. This plant is a short, herbaceous shrub with stems ascending or growing along the ground (prostrate) (Francis, 2009). "Has an un upright or low trailing habit, from 20 to 100 cm in height" (Holm et al., 1977).
ES-6 (Forms dense thickets)	y - low	2	*Mimosa pudica* "...may grow as a single plant or in tangled thickets" (GISD, 2010). In Thailand, "[v]alleys are mostly in rice paddies or are seasonally swampy areas covered with impenetrable thickets of thorny mimosa shrub (*Mimosa pudica*)… Uncultivated riparian areas are commonly covered by... thickets of thorny mimosa" (Wood et al., 2008).

Question ID	Answer - Uncertainty	Score	Notes (and references)
ES-7 (Aquatic)	n - low	0	*Mimosa pudica* occurs "…as a weed of cultivated fields, roadsides, home gardens, and waste places close to urban areas" (Parsons and Cuthbertson, 2001). Common sensitive plant occurs in disturbed and cultivated areas, such as roadsides, vacant allotments, heavily grazed pastures, crops, and lawns (Anonymous, 2013a). "Sensitive plant grows in most well drained soils..." (Francis, 2009). In contrast, "[t]he aquatic plants...*Mimosa pudica* were collected from shallow freshwater ponds and rice fields at Burdwan [India]" (Chandra et al., 2006). Although one source indicates this species may grow in shallow freshwater ponds, this species is primarily a terrestrial shrub, thus we answer no.
ES-8 (Grass)	n - negl	0	*Mimosa pudica* is a legume in the Fabaceae family (Francis, 2009).
ES-9 (Nitrogen-fixing woody plant)	n - low	0	While *M. pudica* forms root nodules that exhibit nitrogen-fixing activity (Pokhriyal et al., 1990), *M. pudica* is described as a "shrub" or "woody herb" by one worker (Francis, 2009), and as a herbaceous shrub by others (Barneby, 1991; Holm et al., 1977; Parsons and Cuthbertson, 2001; Woodson and Schery, 1950). Based on this species' overall habitat, for the purpose of this question we considered it as an herbaceous or semi-woody species, answering no.
ES-10 (Does it produce viable seeds or spores)	y - negl	1	*Mimosa pudica* "reproduces by seeds… freshly harvested seeds germinate within 2 weeks" (Holm et al., 1977). "Germination is epigeal… Most nursery and home propagation is done using seeds…" (Francis, 2009).
ES-11 (Self-compatible or apomictic)	y - low	1	*Mimosa pudica* is "self-pollinating" (Hacker, 1990).
ES-12 (Requires special pollinators)	n - negl	0	"... *M. pudica* L. produces head-type of inflorescences abundantly with exposed stamens which allow easy access for foraging bees in collecting pollen grains" (Cunanan-Deyto et al., 2012). *Mimosa pudica* is both wind and bee pollinated (Chieng and Huang, 1998; Payawal et al., 1991 in Francis, 2009). In the Philippines, *M. pudica* was found to be a major source of pollen for *Apis mellifera* (Payawal et al., 1988). "The giant honeybees [e.g. *Apis dorsata* and other species] are probably canopy specialists, although easily found at *Mimosa pudica* on the ground, where they and other bees gather pollen in the morning" (Roubik et al., 2005).
ES-13 (Minimum generation time)	b - low	1	*Mimosa pudica* is a perennial plant in warm regions of the world (Holm et al., 1977; Hacker, 1990), and reproduces by seed (Parsons and Cuthbertson, 2001). Seed germination to initial flowering can take about three months (Parsons and Cuthbertson, 2001). Following fertilization, fruit mature in four months or less (Opler et al., 1980). This information suggests that *M. pudica* is likely to have at least one generation per year. Alternate answers for the Monte Carlo simulation were both "c."

Question ID	Answer - Uncertainty	Score	Notes (and references)
ES-14 (Prolific reproduction)	n - high	-1	*Mimosa pudica* is described as a "shrub" or "woody herb" by one worker (Francis, 2009), and as a herbaceous shrub by others (Barneby, 1991; Holm et al., 1977; Parsons and Cuthbertson, 2001; Woodson and Schery, 1950). Based on this species' overall habitat, we considered it an herbaceous species here. A single plant of *M. pudica* can produce 600 to 700 seeds in a season (Parsons and Cuthbertson, 2001). In a survey to characterize weed populations in turf grass, *M. pudica* occurred at a density of 4.2 plants per square meter in residential turfs (Uddin et al., 2010). Germination rates of 80 percent in a laboratory test have been reported (Holm et al., 1977). Based on these data, we estimate that *M. pudica* can produce close to 2,400 viable seeds per square meter. Because the threshold yes response for an herbaceous species is 5,000 or more seeds per square meter, we answered no.
ES-15 (Propagules likely to be dispersed unintentionally by people)	y - negl	1	"The relatively small pod with its stiff marginal bristles adheres to wool, fur, and clothing and may be transported considerable distances by these agents" (Parsons and Cuthbertson, 2001). Seeds free from pod "are moved in contaminated sand and gravel used in building and roadwork" (Parsons and Cuthbertson, 2001). "Pods are also spread when attached to... mud on vehicles. Spread by bulldozers, graders, roadside slashers, etc." (PIER, 2013 and reference therein).
ES-16 (Propagules likely to disperse in trade as contaminants or hitchhikers)	y - negl	2	In New Zealand, *M. pudica* is listed as a species found in cocopeat, a coconut fiber product used by the nursery industry (James et al., 2011). In Queensland, Australia, the seeds of *M. pudica* are spread "occasionally as a contaminant of soil and agricultural produce" (UQ, 2011).
ES-17 (Number of natural dispersal vectors)	2	0	Fruit and seed description for questions ES-17a through ES-17e: The fruit is "an oblong and flattened, 1- to 5- seeded pod, 1 to 2 cm long , 3 to 6 mm wide,… edged with prickles, borne in clusters…, and breaking into 1-seeded segments when mature" (Parsons and Cuthbertson, 2001). Seed is "light brown,… 2.5 to 3 mm long" (Parsons and Cuthbertson, 2001).
ES-17a (Wind dispersal)	n - high		We found no evidence that *M. pudica* propagules can be wind dispersed. We answered no, because the pods have prickled edges (Parsons and Cuthbertson, 2001), which makes them unlikely to detach and not get tangled within the plant.
ES-17b (Water dispersal)	y - low		"The one seeded segments which form later, leaving the bristles behind, move easily in flowing water, particularly flood waters" (Parsons and Cuthbertson, 2001). "Seed pods float and are spread by water" (PIER, 2013 and references therein).
ES-17c (Bird dispersal)	n - mod		We found no evidence that *M. pudica* propagules are bird dispersed.
ES-17d (Animal external dispersal)	y - negl		"Seeds [of *M. pudica*] are transported by the means of the bristles on the edges of the pods that cling … to the fur of mammals" (Francis, 2009). A study in French Guiana revealed that *M. pudica* was one of 25 plant species with adaptations for epizoochorous dispersal by barbs, hooks, or spines (stick-tights) (Mori and Brown, 1998).
ES-17e (Animal internal dispersal)	n - mod		We found no evidence that *M. pudica* propagules are dispersed by animals internally.

Question ID	Answer - Uncertainty	Score	Notes (and references)
ES-18 (Evidence that a persistent (>1yr) propagule bank (seed bank) is formed)	? - max	0	Most seeds of *M. pudica* germinate readily, but some seeds produced have a hard seed coat (Parsons and Cuthbertson, 2001), which may help them remain in the soil for several years (DiSalvo, 2010). In a laboratory test, physical and chemical scarification released the seeds of *M. pudica* from dormancy and stimulated germination (Chauhan and Johnson, 2009), suggesting that seeds may have long-term dormancy. However, "seeds stored in a laboratory for 19 years gave a germination of 2 percent" (Holm et al., 1977), suggesting that few seeds actually survive after several years. Because the evidence we found does not clearly inform on long-term seed viability, we answered unknown.
ES-19 (Tolerates/benefits from mutilation, cultivation or fire)	y - mod	1	"Repeated burning may encourage its spread in pastures" (Siregar et al., 1990 cited by Francis, 2009). "The plant can survive mowing" (Waterhouse and Norris, 1987 cited by CABI, 2014).
ES-20 (Is resistant to some herbicides or has the potential to become resistant)	n - negl	0	We found no evidence this species is resistant to herbicides. It is not listed as an herbicide-resistant weed (Heap, 2014). "Very sensitive to picloram (0.25 lb/acre), sensitive to triclopyr (1 lb/acre). Poor control with dicamba and 2,4-D" (Motooka et al., 2003).
ES-21 (Number of cold hardiness zones suitable for its survival)	7	0	
ES-22 (Number of climate types suitable for its survival)	4	2	
ES-23 (Number of precipitation bands suitable for its survival)	10	1	
IMPACT POTENTIAL			
General Impacts			
Imp-G1 (Allelopathic)	n - mod	0	We found no evidence of allelopathy for *M. pudica*. One study using plant extracts found no evidence of allelopathy for the congener *M. caesalpiniaefolia* (Ferreira et al., 2010). In contrast, another study found evidence of allelopathy for congener *M. bimucronata* (Cheng, 2011). We answered no because in both cases evidence was derived from artificial extractions in laboratory studies, and are based on congeners.
Imp-G2 (Parasitic)	n - negl	0	We found no evidence that *M. pudica* is parasitic. It does not belong to a family known to contain parasitic plants (Heide-Jorgensen, 2008; Nickrent, 2012; Walker, 2014).
Impacts to Natural Systems			
Imp-N1 (Change ecosystem processes and parameters that affect other species)	n - mod	0	We found no evidence that *M. pudica* changes ecosystem processes in natural areas. This species is relatively well known and is commonly associated with highly disturbed systems (Francis, 2009) rather than natural areas.
Imp-N2 (Change community structure)	n - mod	0	*Mimosa pudica* needs disturbed sites to invade (Muthuramkumar et al., 2006). While it can form thickets (GISD, 2010) and "form a dense ground cover" (PIER, 2013), we found no information about this plant changing community structure in natural areas.

Question ID	Answer - Uncertainty	Score	Notes (and references)
Imp-N3 (Change community composition)	n - mod	0	*Mimosa pudica* needs disturbed sites to invade (Muthuramkumar et al., 2006). While it can prevent reproduction of other species (PIER, 2013), we found no information that *M. pudica* changes community composition in natural areas.
Imp-N4 (Is it likely to affect federal Threatened and Endangered species)	n - mod	0	*Mimosa pudica* grows in highly disturbed systems (Francis, 2009), so *M. pudica* seems unlikely to affect Threatened and Endangered species in natural areas, we answered no with moderate uncertainty.
Imp-N5 (Is it likely to affect any globally outstanding ecoregions)	n - mod	0	Because *M. pudica* does not appear to be a significant weed of natural areas and because we found no evidence of impact to natural systems, we answered no.
Imp-N6 (Weed status in natural systems)	b - high	0.2	*Mimosa pudica* var. *unijuga* is reported in Haleakala National Park, HI (Anonymous, 2013b; Swearingen, 2008). The U.S. National Park Service treats *M. pudica* in its Integrated Pest Management manual (DiSalvo, 2010). Because *M. pudica* needs disturbed sites to invade (Muthuramkumar et al., 2006), and is commonly associated with highly disturbed systems (Francis, 2009), we answered "b," with high uncertainty. Alternate answers for the Monte Carlo simulation are "a" and "c."
Impact to Anthropogenic Systems (cities, suburbs, roadways)			
Imp-A1 (Impacts human property, processes, civilization, or safety)	n - low	0	Because we found no evidence that *M. pudica* impacts human property, processes, civilization, or safety, we answered no with low uncertainty.
Imp-A2 (Changes or limits recreational use of an area)	n - mod	0	This plant has prickles or thorns along its stems (Francis, 2009), and in the event of skin contact can penetrate and lacerate skin (Holm et al., 1977). However, because we found no evidence that *M. pudica* changes or limits recreational use, we answered no with moderate uncertainty.
Imp-A3 (Outcompetes, replaces, or otherwise affects desirable plants and vegetation)	y - low	0.1	From a garden guide, "This plant [*M. pudica*] forms dense ground covers that prevent the growth of other plants" (Carter, 2010). In a gardening forum, one gardener wrote, "I'm not sure how this plant [*M. pudica*] invaded my front lawn but it has almost completely taken over" (Dave's Garden, 2000-2014).
Imp-A4 (Weed status in anthropogenic systems)	c - negl	0.4	"*Mimosa pudica* is very common as a weed in lawns and scrublands. This seems to be the only species with sensitive leaves that can be found in frequently manicured lawns because it can survive well in a prostrate habit" (Urban Forest, 2014). "Common sensitive plant is a weed of disturbed and cultivated areas, such as roadsides, vacant allotments, heavily grazed pastures, crops and lawns" (Anonymous, 2013a). From a garden guide, "The chemical herbicide dicamba is used to eliminate the sensitive plant from unwanted growing sites" (Carter, 2010). In a gardening forum, one gardener wrote, "With the combination of annual seeds that mature between mowings and the viney growth that allows it to creep, it has become an intolerable nuisance... I've been down on hands and knees for three springs and into the summers pulling it up, along with spraying different types of herbicide on it. Yet, it still is almost totally covering 1/2 of my entire front lawn. And... I live in a rural area so my front lawn is rather large." (Dave's Garden, 2000-2014). Alternate answers for the Monte Carlo simulation were both "b."

Question ID	Answer - Uncertainty	Score	Notes (and references)
Impact to Production Systems (agriculture, nurseries, forest plantations, orchards, etc.)			
Imp-P1 (Reduces crop/product yield)	y - low	0.4	"In direct-sown upland rice in Kerala, India, infestations of *M. pudica* can lead to a 10-70% reduction in grain yield" (Joseph and Bridgit, 1993 cited by CABI, 2014). "Although a well nodulated legume, when dominant, *Mimosa* [*pudica*] tended to reduce available feed, and subsequently cattle growth rates, because of its thorny stems. Cattle can only nibble the growing tips." (Partridge, 1986). *Mimosa pudica* is considered very troublesome or serious in other crops such as corn, sugarcane, rubber, tea, sorghum, and soybeans (Francis, 2009; Holm et al., 1977; Parsons and Cuthbertson, 2001); however, we found no additional information on how it may be impacting those crops.
Imp-P2 (Lowers commodity value)	? - max	0	"Prickles [of *M. pudica*] can injure bulls' genitals, which can lead to infections that disable the animals" (Motooka et al., 2003); however, the source does not provide any further information on the context of how the animals' disability contributes to impact.
Imp-P3 (Is it likely to impact trade)	y - low	0.2	The seeds of *M. pudica* are traded in the United States (Amazon.com, 2014). French Polynesia includes *M. pudica* in their harmful organism list (APHIS, 2014). *Mimosa pudica* is a declared noxious weed in Australia (Parsons and Cuthbertson, 2001). For instance, in the Northern Territory it is a noxious weed to be controlled or its introduction prohibited where not known to occur, and in Western Australia the plant will be eradicated if found and it cannot be introduced into the State or moved from existing locations. Because *M. pudica* is a contaminant in cocopeat, a product used by the nursery industry (James et al., 2011), and because it is an occasional contaminant of soil and agricultural produce (UQ, 2011), it may impact trade to areas restricting its movement.
Imp-P4 (Reduces the quality or availability of irrigation, or strongly competes with plants for water)	n - low	0	This is a fairly well known plant in production systems (Francis, 2009; Holm et al., 1977; Parsons and Cuthbertson, 2001), and we found no evidence that it reduces the quality or availability of water.
Imp-P5 (Toxic to animals, including livestock/range animals and poultry)	n - high	0	Seeds and other plant parts of *M. pudica* contain mimosine, an amino acid known to cause hair loss and depressed growth in mammals (Arora, 1983 cited by Francis, 2009). However, an unlikely large dose is necessary to cause problems (Francis, 2009). In Fiji, *M. pudica* is valued as a forage plant in pastures (Holm et al., 1977). In Malaysia, *M. pudica* is a species categorized as "palatable" (i.e., accepted or grazed by cattle and sheep) (Wahab, 2001). Sheep are reported to feed on it (Simonnet, 1990).
Imp-P6 (Weed status in production systems)	c - low	0.6	*Mimosa pudica* is commonly and widely reported as a weed of pastures (CABI, 2014). In Queensland, Australia, it is "regarded more as a nuisance than a serious weed..." It "is considered very troublesome in several crops, including maize, sugarcane, rubber, tea, sorghum, soybeans, and upland rice, in Malaysia, the Philippines, Indonesia, Papua New Guinea and parts of the South Pacific" (Parsons and Cuthbertson, 2001). Herbicides are used to control this species in rice in Fiji (Mandal, 1977) and in pastures in in Queensland, Australia (Anonymous, 2013a). Alternate answers for the Monte Carlo simulation were both "b."

Question ID	Answer - Uncertainty	Score	Notes (and references)
GEOGRAPHIC POTENTIAL			Unless otherwise indicated, the following evidence represents geographically referenced points obtained from the Global Biodiversity Information Facility (GBIF).
Plant cold hardiness zones			
Geo-Z1 (Zone 1)	n - negl	N/A	We found no evidence that it occurs in this zone.
Geo-Z2 (Zone 2)	n - negl	N/A	We found no evidence that it occurs in this zone.
Geo-Z3 (Zone 3)	n - negl	N/A	We found no evidence that it occurs in this zone.
Geo-Z4 (Zone 4)	n - negl	N/A	We found no evidence that it occurs in this zone.
Geo-Z5 (Zone 5)	n - negl	N/A	We found no evidence that it occurs in this zone.
Geo-Z6 (Zone 6)	n - negl	N/A	We found no evidence that it occurs in this zone.
Geo-Z7 (Zone 7)	y - high	N/A	In the United States, *M. pudica* is reported in Baltimore, MD, and Newport News, VA (Reed, 1964). We answered yes, because it is reported under field conditions, but with high uncertainty because this species is frost sensitive (Francis, 2009).
Geo-Z8 (Zone 8)	y - high	N/A	Although *M. pudica* is frost sensitive (Francis, 2009), there are a few records for Mexico.
Geo-Z9 (Zone 9)	y - negl	N/A	Mexico, Bolivia, Australia, Taiwan, China, and the United States (HI). Herbarium records for Baker County, FL (Wunderlin and Hansen, 2008).
Geo-Z10 (Zone 10)	y - negl	N/A	Mexico, Colombia, Ecuador, Bolivia, and Australia. Herbarium records for Broward, Hillsborough, and Miami-Dade County, Florida (Wunderlin and Hansen, 2008).
Geo-Z11 (Zone 11)	y - negl	N/A	Mexico, Guatemala, Honduras, Belize, Costa Rica, and Colombia
Geo-Z12 (Zone 12)	y - negl	N/A	Mexico, Nicaragua, Costa Rica, and Colombia.
Geo-Z13 (Zone 13)	y - negl	N/A	Mexico, Nicaragua, Costa Rica, Panama, El Salvador, Venezuela, and Brazil.
Köppen -Geiger climate classes			
Geo-C1 (Tropical rainforest)	y - negl	N/A	Mexico, Guatemala, Belize, Nicaragua, Costa Rica, Panama, and the United States (HI and PR).
Geo-C2 (Tropical savanna)	y - negl	N/A	Mexico, Honduras, El Salvador, Nicaragua, Costa Rica, and the United States (HI).
Geo-C3 (Steppe)	n - high	N/A	We found several locations on the edge between savanna and steppe in Mexico, Guatemala, and Tanzania. We answered no because we found no evidence it occurs within steppe environments.
Geo-C4 (Desert)	n - negl	N/A	We found no evidence that it occurs in this climate class.
Geo-C5 (Mediterranean)	n - high	N/A	We found several locations on the edge between marine west coast and Mediterranean in Colombia and Ecuador. We answered no because we found no evidence it occurs within steppe environments.
Geo-C6 (Humid subtropical)	y - negl	N/A	Mexico, Brazil, Nepal, Vietnam, Taiwan, and the United States (FL, VA, and MD).
Geo-C7 (Marine west coast)	y - negl	N/A	Mexico, Guatemala, Colombia, Ecuador, Peru, and Bolivia.
Geo-C8 (Humid cont. warm sum.)	n - negl	N/A	We found no evidence that it occurs in this climate class.
Geo-C9 (Humid cont. cool sum.)	n - negl	N/A	We found no evidence that it occurs in this climate class.
Geo-C10 (Subarctic)	n - negl	N/A	We found no evidence that it occurs in this climate class.
Geo-C11 (Tundra)	n - negl	N/A	We found no evidence that it occurs in this climate class.
Geo-C12 (Icecap)	n - negl	N/A	We found no evidence that it occurs in this climate class.

Question ID	Answer - Uncertainty	Score	Notes (and references)
10-inch precipitation bands			
Geo-R1 (0-10 inches; 0-25 cm)	n - low	N/A	Colombia (3 points); *M. pudica* prefers annual rainfall from 100 cm to an estimated 500 cm (CABI, 2014; GISD, 2010).
Geo-R2 (10-20 inches; 25-51 cm)	y - high	N/A	Although *Mimosa pudica* prefers annual rainfall from 100 cm to an estimated 500 cm (CABI, 2014; GISD, 2010), there are a few records for Ecuador, Venezuela, Brazil, and the United States (HI).
Geo-R3 (20-30 inches; 51-76 cm)	y - mod	N/A	Ecuador, Brazil, Mexico, Puerto Rico, and the United States (HI).
Geo-R4 (30-40 inches; 76-102 cm)	y - mod	N/A	Ecuador, Colombia, Taiwan, and Brazil.
Geo-R5 (40-50 inches; 102-127 cm)	y - low	N/A	Colombia, Australia, Paraguay, and Brazil.
Geo-R6 (50-60 inches; 127-152 cm)	y - low	N/A	Ecuador, French Guiana, Colombia, Taiwan, and the United States (PR).
Geo-R7 (60-70 inches; 152-178 cm)	y - low	N/A	Ecuador, Guyana, Brazil, Colombia, Australia, and the United States (HI).
Geo-R8 (70-80 inches; 178-203 cm)	y - negl	N/A	French Guiana, Australia, Taiwan, Cameroon, Brazil, and the United States (PR).
Geo-R9 (80-90 inches; 203-229 cm)	y - negl	N/A	Mexico, Ecuador, Venezuela, and Colombia.
Geo-R10 (90-100 inches; 229-254 cm)	y - negl	N/A	Mexico, Belize, Nicaragua, Honduras, Guatemala, Brazil, and the United States (HI).
Geo-R11 (100+ inches; 254+ cm))	y - negl	N/A	Mexico, Nicaragua, Honduras, and Liberia. *Mimosa pudica* grows in areas with annual precipitations from about 100 to over 200 cm (GISD, 2010). It prefers annual rainfall from 100 cm to an estimated 500 cm (CABI, 2014).
ENTRY POTENTIAL			
Ent-1 (Plant already here)	y - negl	1	*Mimosa pudica* "has been introduced as a greenhouse plant in the United States and is possibly incipiently naturalized in the southernmost part of our range" (Elias, 1974). It is reported in Florida (Wunderlin and Hansen, 2008), Hawaii (NRCS, 2014), Maryland, and Virginia (Reed, 1964). Also reported for the U.S. territories of American Samoa, Guam, Northern Mariana Islands (PIER, 2013), Puerto Rico (Liogier and Martorell, 2000), and the Virgin Islands (NRCS, 2014). Seeds are widely available for sale, e.g. on eBay and Amazon.com (Amazon.com, 2014; Ebay, 2014).
Ent-2 (Plant proposed for entry, or entry is imminent)	-	N/A	
Ent-3 (Human value & cultivation/trade status)	-	N/A	
Ent-4 (Entry as a contaminant)			
Ent-4a (Plant present in Canada, Mexico, Central America, the Caribbean or China)	-	N/A	
Ent-4b (Contaminant of plant propagative material (except seeds))	-	N/A	
Ent-4c (Contaminant of seeds for planting)	-	N/A	

Question ID	Answer - Uncertainty	Score	Notes (and references)
Ent-4d (Contaminant of ballast water)	-	N/A	
Ent-4e (Contaminant of aquarium plants or other aquarium products)	-	N/A	
Ent-4f (Contaminant of landscape products)	-	N/A	
Ent-4g (Contaminant of containers, packing materials, trade goods, equipment or conveyances)	-	N/A	
Ent-4h (Contaminants of fruit, vegetables, or other products for consumption or processing)	-	N/A	
Ent-4i (Contaminant of some other pathway)	-	N/A	
Ent-5 (Likely to enter through natural dispersal)	-	N/A	