# *Plant Risk Evaluator -- PRE™*
# *Evaluation Report*

# *Ulmus parvifolia* -- Arizona

*2022 Western IPM Grant Project*

**PRE Score:** 14 -- Moderate Potential Risk
**Confidence:** 61 / 100
**Questions answered:** 20 of 20 -- Valid (80% or more questions answered)

**Privacy:** Public
**Status:** Completed

**Evaluation Date:** February 21, 2023

*This PDF was created on May 22, 2025*

*This project was funded in part by the USDA National Institute of Food and Agriculture through the Western Integrated Pest Management Center, grant number 2018-70006-28881.*

# Plant Evaluated

*Ulmus parvifolia*


Image by Daderot

# Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Ulmus parvifolia*) in an effort to understand the invasive history, reproductive strategies, and the impact, if any, on the region's native plants and animals. This research reflects the data available at the time this evaluation was conducted.

## Summary

Ulmus parviflolia, the Chinese elm, or lacebark elm, is a popular urban deciduous tree in Phoenix. Despite its origins from more mesic environments of China, Korea and Japan, it has proven tough and resilient in the arid desert environment, at least under irrigated conditions. It is considered one of the best mesic tree species for urban desert use in Arizona, but it requires irrigation to perform well. It is not a desert-adapted tree. Chinese elm trees can naturalize (reseed) in heavily and not so heavily irrigated landscapes in Phoenix and southern California. This tendency to re-seed, together with possible confusion with the more invasive Siberian elm (Ulmus pumila) has given the Chinese elm an unfavorable reputation of being invasive. The Chinese elm is capable of naturalizing in many parts of the US, including some other western states, however it has not reached the extent of being invasive under the definition of the PRE. Instead, its relative the Siberian elm appears to have reached the level of invasive in many parts of the US, and Siberian elm appears to be a greater invasive threat to Arizona. However this is at higher elevations such as in Yavapai County, and not in the urban desert environment.

## General Information

**Status:** Completed
**Screener:** Michael Chamberland
**Evaluation Date:** February 21, 2023

# Plant Information

**Plant:** *Ulmus parvifolia*

**If the plant is a cultivar, how does its behavior differs from its parent's?**
Ulmus parvifolia, commonly called Chinese elm or lacebark elm, is a medium-sized deciduous tree typically growing to 40-50’ (less frequently to 70’) tall with a rounded crown and long pendulous branching. It is native to China, Korea and Japan. It is noted for its excellent foliage, multi-colored bark, rapid growth and good resistance to Dutch elm disease. Insignificant, small, reddish-green flowers appear in late summer. Flowers give way to single-seeded wafer-like samaras (each tiny seed is surrounded by a flattened circular papery wing) that mature in fall. Elliptic to ovate, shiny dark green leaves (to 3” long) have small teeth. Leaves typically turn an undistinguished dull yellow in fall, but sometimes produce more interesting yellows or reddish-purples. One of the most ornamental features of this tree is its mottled bark. On mature trees, bark flakes to reveal patches of gray, cream, orange, brown and green. There are numerous cultivars such as: 'Allee'TM - also known as 'Emer II' or 'Emerald Vase', is a common cultivar with unusual bark fluting and high stress resistance to urban conditions. 'Brea' - has relatively large dark green leaves that gives the tree a lustrous, coarser texture. 'Cork Bark' - also know as 'Corticosa'; trunk has a corky bark. 'Drake' - has relatively smaller leaves yielding a finer overaell texture; not as cold hardy thus it is best used in Florida, southern Arizona, and southern California. 'Dynasty' - is a National Arboretum selection with great orange-yellow fall color. 'Emerald I' - has a broadly rounded shape with orange, gray and brown bark. 'Emerald II' - is a stress tolerant cultivar tree with attractive mottled bark. 'Sempervirens' - is best for warm coastal climates of southern California and peninsular Florida; it has a mostly evergreen habit with a dark red leaf color in winter. 'True Green' - has a evergreen, beautiful pendulous habit. 'Yatsubusa' - is a dwarf cultivar growing only 6 feet tall, great for very small landscape spaces.

# Regional Information

**Region Name:** Arizona

# Climate Matching Map

To answer four of the PRE questions for a regional evaluation, a climate map with three climate data layers (Precipitation, UN EcoZones, and Plant Hardiness) is needed. These maps were built using a toolkit created in collaboration with GreenInfo Network, USDA, PlantRight, California Invasive Plant Council, and The Information Center for the Environment at UC Davis.

Click here to see the generated climate matching map for this region. This climate match database is hosted by GreenInfo Network and publicly accessible.

# Evaluation Questions

These questions are based on an article published by PLOS One, which can be found here: https://doi.org/10.1371/journal.pone.0121053.

## Invasive History and Climate Matching (Questions 1 - 6)

### 1. Has the species (or cultivar or variety, if applicable; applies to subsequent "species" questions) become naturalized where it is not native?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

Chinese elm has a native range through North and Central China, Korea, Japan (Bugwood, 2018). Trees can naturalize (reseed) in heavily and not so heavily irrigated landscapes in Phoenix and southern California (Martin, 2023). It has been found to be invasive in some situations in Wisconsin (USDA, 2000). It has been found escaped in Arkansas (Serviss & Serviss, 2020). Ulmus parvifolia is found in many coastal counties of southern and central California (Calflora, 2023).

**Reference(s):**


- Bugwood (2018). Invasive Plant Atlas of the United States - Chinese Elm.
- Martin, C. (2023). Virtual Library of Phoenix Landscape Plants.
- USDA (2000). USDA NRCS Plant Guide.
- Serviss, B. E., & Serviss T. K. (2020). NOTEWORTHY RECORDS OF PISTACIA CHINENSIS (ANACARDIACEAE) AND ULMUS PARVIFOLIA (ULMACEAE) IN ARKANSAS. Phytoneuron. 85,
- Calflora (2023). CALFLORA Taxon Report - Ulmus parvifolia.


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### 2. Is the species (or cultivar or variety) noted as being naturalized in the US or world in a similar climate?

- Answer: **Yes**, which contributes **2** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

Ulmus parvifolia is found in many coastal counties of southern and central California, and a few counties in the Central Valley and elsewhere (Calflora, 2023). This includes climate-matching areas. The tree is naturalized in southern Nevada, northern New Mexico, and parts of central Texas and Oklahoma which are a climate-match for Arizona (Bugwood, 2018). The tree is reported as naturalized in three subdivisions of New South Wales, Australia (Murray, 2023). GBIF (2023) shows the plant naturalized in climate-matching parts of Australia, Mexico and South Africa.

**Reference(s):**


- Calflora (2023). CALFLORA Taxon Report - Ulmus parvifolia.
- Bugwood (2018). Invasive Plant Atlas of the United States - Chinese Elm.
- Murray, L. (2023). NEW SOUTH WALES FLORA ONLINE.
- GBIF (2023). GBIF—the Global Biodiversity Information Facility, Ulmus parvifolia.


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## 3. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

- Answer: **Yes**, which contributes **2** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

The plant has the potential to be weedy through self-seeding in surrounding landscapes (NC Extension, 2023). Trees can naturalize (reseed) in heavily and not so heavily irrigated landscapes in Phoenix and southern California (Martin, 2023). It is reported invasive in DC, NC, NE, NJ, VA, and WI (USDA, 2005) but it is not listed on state or federal Noxious Weed lists. Most accounts refer to Chinese elm as a weed or naturalizing. It is unclear if it causes significant economic or environmental damage required to be considered an invasive species as defined by the PRE. GBIF (2023) states that there is no evidence of impact where the plant is naturalized in the USA and Australia, however it does list it as having impact in southern Africa. The answer is given as Yes with low confidence.

**Reference(s):**


- NC, E. (2023). North Carolina Extension Gardener.
- Martin, C. (2023). Virtual Library of Phoenix Landscape Plants.
- USDA (2005). Weed of the Week. Weed of the Week.
- GBIF (2023). GBIF—the Global Biodiversity Information Facility, Ulmus parvifolia.


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## 4. Is the species (or cultivar or variety) noted as being invasive in the US or world in a similar climate?

- Answer: **Yes**, which contributes **3** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

The tree is naturalized in southern Nevada, northern New Mexico, and parts of central Texas and Oklahoma which are a climate-match for Arizona (Bugwood, 2018). The tree is reported as naturalized in three subdivisions of New South Wales, Australia (Murray, 2023) which appear to be climate-matched. Most accounts refer to Chinese elm as a weed or naturalizing, leaving it unclear if it causes significant economic or environmental damage required to be considered an invasive species as defined by the PRE. GBIF (2023) does list it as having impact in South Africa, an area with a climate match. The answer is given as Yes with low confidence.

**Reference(s):**


- Bugwood (2018). Invasive Plant Atlas of the United States - Chinese Elm.
- Murray, L. (2023). NEW SOUTH WALES FLORA ONLINE.
- GBIF (2023). GBIF—the Global Biodiversity Information Facility, Ulmus parvifolia.


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## 5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

**Answer / Justification:**

Ulmus pumila is invasive in areas with a similar climate, as well as areas with non-matching climate (Hirsh & Hensen, 2010).

**Reference(s):**


- Hirsch, H., & Hensen I. (2010). Investigations on the invasion success of Ulmus pumila L. in North America and Argentina.

### 6. Is the species (or cultivar or variety) found predominately in a climate matching the region of concern?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

Chinese elm is native to China, Korea, and Japan (NC Extension, 2023). These areas are mostly not climate-matching with Arizona. Major areas of occurrence for Chinese elm are in East Asia and the eastern and central USA (GBIF, 2023). Less than half (

## Impact on Native Plants and Animals (Questions 7 - 10)

### 7. Does this plant displace native plants and dominate (overtop or smother) the plant community in areas where it has established?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

The literature does not offer accounts of naturalized plants overtoping plant communities. However the plant is an erect tree from 30-60 ft. tall (Bugwood, 2018) which by size alone suggests this likelihood.

**Reference(s):**


- Bugwood (2018). Invasive Plant Atlas of the United States - Chinese Elm.


### 8. Is the plant noted as promoting fire and/or changing fire regimes?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

The literature does not mention fire effects associated with this plant. It appears native to largely mesic land areas (China, Korea, Japan) (Bugwood, 2018) which are not obviously prone to fire regimes. Other elms are not known to promote fire regimes. This infers an answer of no.

**Reference(s):**


- Bugwood (2018). Invasive Plant Atlas of the United States - Chinese Elm.


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## 9. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

No health risks have been mentioned in Leopold's (1980) comprehensive article on Chinese and Siberian elms.

**Reference(s):**


- Leopold, D. (1980). Chinese and Siberian Elms. Arboriculture & Urban Forestry. 6, 175–179.


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## 10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

Ulmus parvifolia is a medium to large, deciduous tree to 25 meters tall (Serviss & Serviss, 2020). Its growth form does not suggest the formation of thickets. However photos of naturalized seedlings in Serviss & Serviss (2020) suggest the small plants in sufficient numbers might approximate a thicket.

**Reference(s):**


- Serviss, B. E., & Serviss T. K. (2020). NOTEWORTHY RECORDS OF PISTACIA CHINENSIS (ANACARDIACEAE) AND ULMUS PARVIFOLIA (ULMACEAE) IN ARKANSAS. Phytoneuron. 85,


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# Reproductive Strategies (Questions 11 - 17)

## 11. Does this species (or cultivar or variety) reproduce and spread vegetatively?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

No mention of vegetative spread is mentioned in Leopold's (1980) comprehensive article on Chinese and Siberian elms. Instead, he mentions the difficulty of propagation by cuttings.

**Reference(s):**


- Leopold, D. (1980). Chinese and Siberian Elms. Arboriculture & Urban Forestry. 6, 175–179.


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## 12. If naturally detached fragments from this plant are capable of producing new plants, is this a common method of reproduction for the plant?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

No mention of vegetative spread is mentioned in Leopold's (1980) comprehensive article on Chinese and Siberian elms. Reproduction by fragmentation is not suggested from the biology of the tree.

**Reference(s):**


- Leopold, D. (1980). Chinese and Siberian Elms. Arboriculture & Urban Forestry. 6, 175–179.


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## 13. Does the species (or cultivar or variety) commonly produce viable seed?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

Storjohann and Whitcomb (1977) collected lacebark elm seeds at Oklahoma State University and found that 75 to 80% of the seeds were empty. They also found that lacebark elm (=Chinese elm) seeds are the most viable if collected before a hard freeze. Freshly collected fruits should be air-dried for a few days before being sown or stored. Ulmus parvifolia seed has a viability period of 0.5 years (Bonner & Karrfalt, 2008). From these data it is inferred that Ulmus parvifolia does not produce seeds of high viability or longevity, but might make up for it in numbers of seed. A Yes answer is given because the plant produces viable seeds commonly enough to self-seed and naturalize to a notable degree in some settings, including in Phoenix (Martin, 2023) which does not experience a hard freeze.

**Reference(s):**


- Bonner, F. T., & Karrfalt R. P. (2008). The Woody Plant Seed Manual. Agriculture Handbook 727,
- Martin, C. (2023). Virtual Library of Phoenix Landscape Plants.


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## 14. Does this plant produce copious viable seeds each year (> 1000)?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

No information could be found in the literature. The large size that the tree may grow to suggests a large number of seeds may be produced. While reports that 75 to 80% of the seeds are empty (Bonner & Karrfalt, 2008) the tree still makes sufficient viable seed to naturalize.

**Reference(s):**


- Bonner, F. T., & Karrfalt R. P. (2008). The Woody Plant Seed Manual. Agriculture Handbook 727,


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## 15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

A high percentage of Chinese elm seeds are generally without embryo or may be sterile (Leopold, 1980). Ulmus parvifolia seed has a viability period of 0.5 years (Bonner & Karrfalt, 2008). These two factors lend towards a no answer.

**Reference(s):**


- Leopold, D. (1980). Chinese and Siberian Elms. Arboriculture & Urban Forestry. 6, 175–179.
- Bonner, F. T., & Karrfalt R. P. (2008). The Woody Plant Seed Manual. Agriculture Handbook 727,


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## 16. Does this plant produce viable seed within the first three years (for an herbaceous species) to five years (for a woody species) after germination?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

Bonner & Karrfalt (2008) present a table of minimal reproductive age for various Ulmus species. The minimum reproductive age for Ulmus parvifolia is not given. However the shortest minimal reproductive age for an elm listed is 8 years for U. pumila. Because Chinese elm is a larger tree, it is inferred it would require at least as long to reach reproductive age.

**Reference(s):**


- Bonner, F. T., & Karrfalt R. P. (2008). The Woody Plant Seed Manual. Agriculture Handbook 727,


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### 17. Does this plant continuously produce seed for >3 months each year or does seed production occur more than once a year?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

**Answer / Justification:**

Bonner & Karrfalt (2008) indicate that fruit ripening and seed dispersal take place over two months, Sep-Oct.

**Reference(s):**


- Bonner, F. T., & Karrfalt R. P. (2008). The Woody Plant Seed Manual. Agriculture Handbook 727,


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## Dispersal (Questions 18 - 20)

### 18. Are the plant's propagules frequently dispersed long distance (>100 m) by mammals or birds or via domestic animals?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

**Answer / Justification:**

The seeds are winged and are dispersed primarily by the wind (USDA, 2005).

**Reference(s):**


- USDA (2005). Weed of the Week. Weed of the Week.


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## 19. Are the plant's propagules frequently dispersed long distance (>100 m) by wind or water?

- Answer: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

The seeds are winged and are dispersed primarily by the wind (USDA, 2005). Another large elm tree, the American elm makes samaras which fall within 91 m of the parent tree (Barbour & Brinkman). They also note that for Rock elm, buoyant samaras can be carried by water and are frequently found along stream and lake banks.

**Reference(s):**


- USDA (2005). Weed of the Week. Weed of the Week.
- Barbour, J. R., & Brinkman K. A. (0). Ulmaceae - Elm family.


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## 20. Are the plant's propagules frequently dispersed via contaminated seed (agriculture or wildflower packets), equipment, vehicles, boats or clothing/shoes?

- Answer: **No**, which contributes **0** point(s) to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

**Answer / Justification:**

The literature does not mention the likelihood of Ulmus parvifolia seed being dispersed on equipment or vehicles, but this is cited as a method of spread for Ulmus pumila, which has similar winged fruits/seeds (USDA, 2014).

**Reference(s):**


- USDA (2014). Field Guide for Managing Siberian Elm in the Southwest.


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## Total PRE Score

**PRE Score:** 14 -- Moderate Potential Risk
**Confidence:** 61 / 100
**Questions answered:** 20 of 20 -- Valid (80% or more questions answered)

### PRE Score Legend

The PRE Score is calculated by adding the point totals for each (answered) question.
< 13 : Low Potential Risk
13 - 15 : Moderate Potential Risk
> 15 : High Potential Risk

### Questions Answered Legend

It is important to answer at least 16 questions to consider a PRE Score as "valid".
>= 16 : valid (80% or more questions answered)
<= 15 : invalid (not enough questions answered)

## Organization Ownership and Content Privacy

**Organization:** 2022 Western IPM Grant Project
**Content Privacy:** Public

## Evaluation Reviewers

The PRE approach is to base decisions on science and make decisions by consensus of diverse horticultural stakeholders. The literature review and process of answering PRE's questions are based on science; the decisions of which plants to prioritize are based on consensus. To ensure this process is in place and that PRE is collaborative, volunteer stakeholders are recruited from each region to review evaluations. The following experts in their profession (plant science, conservation, or horticultural trade) have participated as volunteer PRE reviewers for this evaluation:

| | |
|---|---|
| • Ron Vanderhoff | February 25, 2023 |
| • Alex Simmons | February 23, 2023 |
| • Jutta Burger | February 22, 2023 |

This evaluation has a total of 3 reviewer(s).

# Evaluation Issues

The following section lists all public issues for this evaluation. Issues provide a way for stakeholder reviewers to communicate any concerns or suggestions they might have with the plant or evaluation. Please email info@plantright.org if additional action is required to resolve open issues.

## Issue ID # 8897

**Date Created:** February 25, 2023 - 8:27am
**Date Updated:** February 26, 2023 - 12:06pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

**Issue Description**

This should be a "Yes". Several references list this as an invasive in various areas. Here's a good one for some U.S. areas from the USFS, which lists District of Columbia, North Carolina, New Jersey, Virginia, Wisconsin and Nebraska. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.invasive.org/weedcd/pdfs/wow/chinese-elm.pdf

- Ron

**Issue Resolution (Screener's Response to Issue)**

I have changed this to "Yes" but I note low confidence as the plant is not clearly meeting the environmental and economic damaged required to meet the definition of invasive as used by the PRE, but impact is supported for South Africa by GBIF. - Michael Chamberland

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## Issue ID # 8896

**Date Created:** February 25, 2023 - 8:12am

**Date Updated:** February 26, 2023 - 7:35pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q19. Are the plant’s propagules frequently dispersed long distance (>100 m) by wind or water?

**Issue Description**

Agree with you answers.

This reference also mentions buoyant fruits and dispersal by water and that they are found along stream banks and lake shores (which is my experience here in SoCal as well):

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fs.usda.gov/nsl/Wpsm/Ulmus.pdf

Although no mention of the distance of this water dispersal, 100m would seem insignificant and easily achieved. Might be worth adding this as a second reference. - Ron

**Issue Resolution (Screener's Response to Issue)**

I have added that reference with comments. - Michael Chamberland

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## Issue ID # 8895

**Date Created:** February 25, 2023 - 7:55am
**Date Updated:** February 26, 2023 - 7:24pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q18. Are the plant’s propagules dispersed long distance (>100 m) by mammals or birds or via domestic animals?

**Issue Description**

Agree with your assessment. As another reference you might include this one: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fs.usda.gov/nsl/Wpsm/Ulmus.pdf

It quantifies seed drops of between only 40-91m of the parent tree on two other Ulmus species. - Ron

**Issue Resolution (Screener's Response to Issue)**

Yes but the info you mention does not pertain to animal dispersal for this question. - Michael Chamberland

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## Issue ID # 8894

**Date Created:** February 25, 2023 - 7:47am
**Date Updated:** February 26, 2023 - 7:21pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q15. Is there significant germination (>25%) of seeds the next growing season, with no requirement of an infrequent environmental condition for seeds to germinate (i.e. fire) or long dormancy period?

**Issue Description**

I agree with your "No" answer, as it would be very unlikely to have a 25% germination rate (in fact, a 25% germination rate for almost any tree would seem very, very unlikely). However, it might be worth noting in a comment that seed "viability" may be as high as 50-70%. Of course viability and germination are different measurements but this would be of interest. Here are a couple of references to my "germination" thought:

A non-science reference to U. parvifolia says "50-70% germination": https://bonsaisupply.ca/products/chinese-elm-ulmus-parvifolia-bonsai-seeds

This peer-reviewed paper indicates 60-70% germination, although not specifically U. parvifolia: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.fs.usda.gov/nsl/Wpsm/Ulmus.pdf - Ron

**Issue Resolution (Screener's Response to Issue)**

I do not understand this to be an issue. - Michael Chamberland

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## Issue ID # 8893

**Date Created:** February 25, 2023 - 7:39am
**Date Updated:** February 26, 2023 - 7:18pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q14. Does this plant produce copious viable seeds each year (>1000)?

**Issue Description**

I feel uncomfortable giving this a "No". With no information it should likely be left unanswered, since a lack of data does not necessarily mean a no. However, there is quite a bit of evidence in the literature about other Ulmus species that might be used as a reference. Here's a brief statement about "prolific seed" in U. americana: https://www.srs.fs.usda.gov/pubs/misc/ag_654/volume_2/ulmus/americana.htm

Here's a reference specific to U. parvifolia. Although not in a technical paper it refers to seed as "numerous": https://blog.growingwithscience.com/2011/03/seed-of-the-week-chinese-elm/

My suspicion is that with a bit of rigor there might be some additional references to support a "Yes" answer. If direct accounts for this species or specific mentions of seeds per tree cannot be found, then at least still a "Yes", but with a low/medium confidence. - Ron

**Issue Resolution (Screener's Response to Issue)**

Ok, I have changed the answer to a Yes. - Michael Chamberland

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## Issue ID # 8892

**Date Created:** February 24, 2023 - 9:57pm
**Date Updated:** February 26, 2023 - 7:11pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q13. Does the species (or cultivar or variety) commonly produce viable seed?

**Issue Description**

This question simply states "Does the tree commonly produce viable seed?" It is not specifically about the abundance of seed. Taken at face-value this might be a "Yes", since the referenced Storjohann and Whitcomb study DOES indicate seed production, even if only 20% might be viable. Given even a reasonable quantity of flowers and fruits even 20-25% germination with seeds is a great deal of seed. - Ron

**Issue Resolution (Screener's Response to Issue)**

Changed to a Yes answer. - Michael Chamberland

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## Issue ID # 8891

**Date Created:** February 24, 2023 - 9:49pm
**Date Updated:** February 26, 2023 - 7:10pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q10. Does the plant produce impenetrable thickets, blocking or slowing movement of animals, livestock, or humans?

**Issue Description**

I'm not sure about a "No" on this. Although you were not able to find any direct references to substantiate this, there are some inferences. This is a large, well-branched and rather dense habit. Depending upon winter temperatures it can at least be semi-evergreen as well. All of these plant and growth characteristics at least infer an impact on animal/livestock/human movement.

Just from these characters alone you might consider a "Yes", but with "Low" confidence. - Ron

**Issue Resolution (Screener's Response to Issue)**

Ok, I have switched this to a Yes answer. - Michael Chamberland

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## Issue ID # 8890

**Date Created:** February 24, 2023 - 9:39pm
**Date Updated:** February 26, 2023 - 7:08pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q09. Is the plant a health risk to humans or animals/fish? Has the species been noted as impacting grazing systems?

**Issue Description**

A few references do indeed list U. parvifolia as at least mildly toxic to pets as well as livestock. Some of these claims may be anecdotal, but others look legitimate. Maybe do a bit more research on this and report what you find. Here are a couple I noticed:

https://bonsaialchemist.com/learning-center/care/is-the-chinese-elm-poisonous-to-animals/
https://blogdigger.com/chinese-elm-tree/

- Ron

**Issue Resolution (Screener's Response to Issue)**

I need more than unverified anecdotal accounts.  The serious discussions of U. parvifolia do not mention toxicity. - Michael Chamberland

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## Issue ID # 8889

**Date Created:** February 24, 2023 - 9:23pm
**Date Updated:** February 26, 2023 - 7:04pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q07. Does this plant displace native plants and dominate the plant community in areas where it has been established?

**Issue Description**

Excellent comments. As an additional reference you could refer to Calflora, where there are several accounts and images of large plants and in reasonable abundance. Certainly these plants are displacing and shading native vegetation. Your option. - Ron

**Issue Resolution (Screener's Response to Issue)**

Yes the size of the plant is well established. - Michael Chamberland

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## Issue ID # 8888

**Date Created:** February 24, 2023 - 8:46pm
**Date Updated:** February 26, 2023 - 7:39pm

**Submitted by:** Ron Vanderhoff

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Plant Information

**Issue Description**

This is a very thorough discussion of the various cultivars and selections. However, you might preface this cultivar information with some overall comments about the species and its characteristics. Such as its evergreen/deciduous nature, general size and form, rooting, etc. - Ron

**Issue Resolution (Screener's Response to Issue)**

Done. - Michael Chamberland

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## Issue ID # 8875

**Date Created:** February 23, 2023 - 3:38pm
**Date Updated:** February 26, 2023 - 12:11pm

**Submitted by:** Alex Simmons

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q06. Is the species found predominately in a climate matching the region of concern?

**Issue Description**

I think this question is asking about all areas of occurences and not just the native range. I wonder if you should mention other places it occurs as well? -Alex Simmons

**Issue Resolution (Screener's Response to Issue)**

Less than half (<50%) of the places where the plant grows are a climate match to Arizona. - Michael Chamberland

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## Issue ID # 8868

**Date Created:** February 22, 2023 - 3:10pm
**Date Updated:** February 26, 2023 - 11:35am

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Major
**Scope:** Q13. Does the species (or cultivar or variety) commonly produce viable seed?

**Issue Description**

Since this plant does not reproduce vegetatively but has naturalized and is even considered invasive in some areas, the answer to this question should be "yes". As you say, the low viability can be made up in numbers of seeds/fruits produced, still resulting in it regularly producing viable seeds. - Jutta

**Issue Resolution (Screener's Response to Issue)**

Changed to "Yes" with an adjusted statement in the text. - Michael Chamberland

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## Issue ID # 8867

**Date Created:** February 22, 2023 - 2:59pm
**Date Updated:** February 26, 2023 - 12:06pm

**Submitted by:** Jutta Burger

**Status:** Fixed
**Type:** Suggestion
**Severity:** Minor
**Scope:** Q03. Is the species (or cultivar or variety) noted as being invasive in the U.S. or world?

**Issue Description**

The answer to this question should be "yes". According to https://www.invasive.org/weedcd/pdfs/wow/chinese-elm.pdf, this species is listed as invasive in several states in the U.S. - Jutta

**Issue Resolution (Screener's Response to Issue)**

I have changed this to "Yes" but I note low confidence as the plant is not clearly meeting the environmental and economic damaged required to meet the definition of invasive as used by the PRE, but impact is supported for South Africa by GBIF. - Michael Chamberland

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# About PRE and this Plant Evaluation Report

The Plant Risk Evaluator (PRE) is an online database and platform designed to assess the risk of a plant becoming invasive in a given region.This tool offers many benefits, and we encourage you to visit the PRE website (https://pretool.org) for more information.

If you would like to learn more about PRE, please email us at info@plantright.org, requesting a PRE Account.

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