Plant Risk Evaluator -- PRE™
Evaluation Report

Ulmus pumila -- Texas

2017 Farm Bill PRE Project

PRE Score: 18 -- Reject (high risk of invasiveness)
Confidence: 69 / 100
Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Submitted

Evaluation Date: September 30, 2017

This PDF was created on July 06, 2018

Plant Evaluated

Ulmus pumila

Image by Wikipedia

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Ulmus pumila*) 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 pumila is naturalized across most of the U.S. and invasive in New Mexico, Texas, Illinois, and New Hampshire. Trees produce a large number of wind dispersed seeds, that germinate rapidly forming dense thickets which shade out native species.

General Information

Status: Submitted
Screener: Kim Taylor
Evaluation Date: September 30, 2017

Plant Information

Plant: *Ulmus pumila*

If the plant is a cultivar, how does its behavior differs from its parent's?
This evaluation is for the species, not a particular cultivar.

Regional Information

Region Name: Texas

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 in an original article published at the University of California, Davis, and can be found on the PLOS One website, 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** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Kartesz indicates Ulmus pumila is naturalized across most the the U.S., with the esxception of South Carolina, Georgia, Alabama, Florida, and Mississippi. USDA Plants indicates it is also naturalized across most of Canada.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).
- USDA, & NRCS (2017). The Plants Database.

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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** points to the total PRE score.
- The *screener* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

Kartesz indicates Ulmus pumila is naturalized across most the the U.S., with the exception of South Carolina, Georgia, Alabama, Florida, and Mississippi.

Reference(s):

- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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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** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The Global Compendium of Weeds identifies the species as "casual alien, cultivation escape, environmental weed, garden thug, naturalised, noxious weed, weed". Siberian elm is listed as a "Class C noxious weed" in New Mexico. The species is listed by TexasInvasives.org. EDD Maps indicates the species is invasive in New Mexico, Illinois, and New Hampshire.

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- USDA, & NRCS (2017). The Plants Database.
- Global Compendium of Weeds (GCW) (0). Ulmus pumila information from the Global Compendium of Weeds (GCW).

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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** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The Global Compendium of Weeds identifies the species as "casual alien, cultivation escape, environmental weed, garden thug, naturalised, noxious weed, weed". Siberian elm is listed as a "Class C noxious weed" in New Mexico. The species is listed by TexasInvasives.org. EDD Maps indicates the species is invasive in New Mexico, Illinois, and New Hampshire.

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- USDA, & NRCS (2017). The Plants Database.
- Global Compendium of Weeds (GCW) (0). Ulmus pumila information from the Global Compendium of Weeds (GCW).

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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** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Ulmus glabra, U. parvifolia, and U. procera are all naturalized in the U.S. in areas with similar climate to Texas. U. parvifolia is naturalized in Texas and listed in the Invasive Plant Atlas of the U.S.. 18 taxa in the genus Ulmus are listed in the Global Compendium of Weeds.

Reference(s):

- Invasive Plant Atlas of the United States (0). Chinese elm: Ulmus parvifolia (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- Global Compendium of Weeds (0). Global Compendium of Weeds: species index.
- Kartesz, J. T. (2015). The Biota of North America Program (BONAP).

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

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

Answer / Justification:

Less than half of the species range has a similar climate to Texas.

Reference(s):

- GBIF (0). Ulmus pumila L. (GBIF).

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** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Fast growing seedlings of Siberian elm quickly overtake native vegetation, especially shade-intolerant species." "The tree can become dominant in prairies subjected to disturbances and displaces native forbs and grasses"

Reference(s):

- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).

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

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

Answer / Justification:

weak tree that drops branches. Probably impacts fire by producing fine fuels from dropped branches.

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).

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

Answer / Justification:

"It forms dense thickets that close open areas and displace native vegetation, thereby reducing forage for wild animals and livestock." It is not known to be poisonous.

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- Plants For A Future (PFAF) (0). Ulmus pumila Siberian Elm, Hybrid elm PFAF Plant Database.

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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** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Thickets of seedlings soon form around seed-producing trees, bare ground areas, animal and insect mounds, and other disturbed areas." "It forms dense thickets that close open areas and displace native vegetation, thereby reducing forage for wild animals and livestock." " Seedlings may form dense thickets with hundreds of plants."

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).

Reproductive Strategies (Questions 11 - 17)

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

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

Answer / Justification:

Ulmus pumila will resprout from the roots when cut down but it does not spread in this way. "It sprouts vigorously from the roots"

Reference(s):

- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).

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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** points to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

There is no evidence of this.

Reference(s):

- [Anonymous] .

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

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

Answer / Justification:

"Freely self-seeds." seed is viable

Reference(s):

- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).
- Missouri Botanical Garden PlantFinder (0). Ulmus pumila - Plant Finder.

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

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

Answer / Justification:

"The abundant, wind-dispersed seeds allow this plant to spread rapidly." ""Dense infestations produce > 1000 seeds per square meter" Since trees grow rather large it is likely a single tree would produce over 1000 seeds in a year.

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).

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

Answer / Justification:

"Seeds are produced early in spring and spread by the wind. Germination rate is high and seedlings soon establish in the bare ground found early in the growing season." "sow 3m @ 39ºF, move to 70ºF for germ." "Seed - if sown in a cold frame as soon as it is ripe, it usually germinates within a few days. Stored seed does not germinate so well and should be sown in early spring. The seed can also be harvested 'green' (when it has fully developed but before it dries on the tree) and sown immediately in a cold frame. It should germinate very quickly and will produce a larger plant by the end of the growing season"

Reference(s):

- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- Clothier, T. (0). Tree/Shrub Seed Germination - Quick Reference.
- Plants For A Future (PFAF) (0). Ulmus pumila Siberian Elm, Hybrid elm PFAF Plant Database.

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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** points to the total PRE score.
- The *screener* has a **Low** confidence in this answer based on the available literature.

Answer / Justification:

"Siberian elm is a fast-growing tree in the elm family" " The American Elm reaches reproductive maturity at around 15 years of age"

Reference(s):

- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- Pacific Island Ecosystems at Risk (PIER) (0). Ulmus pumila (PIER species info).

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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** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

"Seeds are produced early in spring and spread by the wind. Germination rate is high and seedlings soon establish in the bare ground found early in the growing season." "Bloom Time: March to April" "Seeds mature in April-May" " Fl. and fr. Mar-May. 2n = 28." "It is in flower in April, and the seeds ripen in May."

Reference(s):

- TexasInvasives.org (0). Texas Invasives Ulmus pumila.
- Missouri Botanical Garden PlantFinder (0). Ulmus pumila - Plant Finder.
- efloras.org (0). Ulmus pumila in Flora of China @ efloras.org.
- Plants For A Future (PFAF) (0). Ulmus pumila Siberian Elm, Hybrid elm PFAF Plant Database.

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** points to the total PRE score.
- The *screener* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

Seeds are wind dispersed. There is no evidence of dispersal by animals.

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- TexasInvasives.org (0). Texas Invasives Ulmus pumila.

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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** points to the total PRE score.
- The *screener* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

"Wind carries seed to distant areas where new colonies can form." "The abundant, wind-dispersed seeds allow this plant to spread rapidly."

Reference(s):

- Invasive Plant Atlas of the United States (0). Siberian elm: Ulmus pumila (Urticales: Ulmaceae): Invasive Plant Atlas of the United States.
- TexasInvasives.org (0). Texas Invasives Ulmus pumila.

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

Answer / Justification:

GRIN indicates the species is a "potential seed contaminant". It is not clear if this is a frequent method of dispersal.

Reference(s):

- U.S. National Plant Germplasm Network (0). Taxonomy - GRIN-Global Web v 1.9.8.2 Ulmus pumila.

Total PRE Score

PRE Score: 18 -- Reject (high risk of invasiveness)
Confidence: 69 / 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 : accept (low risk of invasiveness)
13 - 15 : evaluate further
> 15 : reject (high risk of invasiveness)

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: 2017 Farm Bill PRE 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:

- Steve Moore October 4, 2017

This evaluation has a total of 1 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 PlantRight@suscon.org if additional action is required to resolve open issues.

There are currently no issues associated with this evaluation.

About PRE and this Plant Evaluation Report

The PlantRight Plant Risk Evaluator -- PRE is an online database and platform enabling those involved in non-native, terrestrial plant production to know before they grow if a plant poses a regional invasive risk. This tool offers many benefits, and we encourage you to visit the PRE website (https://pre.ice.ucdavis.edu) for more information.

If you are a nursery trade association, or involved in the research, development or distribution of horticultural plants we invite you to join the PRE community. If you are a plant scientist, affiliated with a horticultural college or botanic garden, and would like to learn more about becoming a PRE Screener, please drop us an email, PlantRight@suscon.org, requesting a PRE Account.

PRE beta funding is provided by Sustainable Conservation (http://www.suscon.org/) and a USDA Farm Bill grant.