Plant Risk Evaluator -- PRE™
Evaluation Report

Elaeagnus pungens -- Georgia

2017 Farm Bill PRE Project

PRE Score: 18 -- Reject (high risk of invasiveness)
Confidence: 66 / 100
Questions answered: 18 of 20 -- Valid (80% or more questions answered)

Privacy: Public
Status: Completed

Evaluation Date: April 19, 2017

This PDF was created on August 13, 2018

Plant Evaluated

Elaeagnus pungens

Image by James H. Miller, USDA Forest Service

Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Elaeagnus pungens*) 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

E. pungens is not native to the United States and was introduced in the early 1800's as an ornamental. It was frequently planted along highways as a natural barrier and in abandoned mine sites. Most references describe the plant as a fast growing "weedy" species that once established will scramble through the surrounding vegetation via vegetative stem sprouts, displacing other natives. Additionally reports of bird mortality have been associates with E. pungens fruits. The plant has escaped cultivation and spread throughout the southeast including the region of concern, and is listed as invasive in both Florida and Tennesee. Although some of the botanical indicators of invasivess do not align well (for example the fruits do not persist on the tree very long for E.pungens) , the climate matching questions indicate E.pungens could easily establish and thrive in Georgia, and has already become invasive in some south eastern states with a climate match.

General Information

Status: Completed
Screener: Kylie Bucalo
Evaluation Date: April 19, 2017

Plant Information

Plant: *Elaeagnus pungens*

Regional Information

Region Name: Georgia

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 **High** confidence in this answer based on the available literature.

Answer / Justification:

E. pungens is not native to the United States. It was introduced from Asia and escaped populations have spread throughout the southeast. Excerpt form the Forest Service resource - "Forest Inventory Analysis data from 12 southern states in 2008 indicated that thorny-olive occupied an estimated 6,107 acres (2,471 ha) in forests in 6 states"

Reference(s):

- USDA Plants Database (0). Plants Profile for Elaeagnus pungens (thorny olive)- USDA distribution map.
- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

Many southeastern states that are a climate match for Georgia contain E.pungens including Georgia, Alabama, Mississippi, Louisiana, and Florida.

Reference(s):

- USDA Plants Database (0). Plants Profile for Elaeagnus pungens (thorny olive)- USDA distribution map.
- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 Florida Exotic Plant Pest Council, places thorny olive on the Invasive Plant list. The Southeast Exotic Pest Plant Council (1996) reports E. pungens as a invasive exotic pest plants in Tennessee. The Georgia Exotic Pest Plant Council ranks E.pungens as EPPC RANK 2. This category is described as "an exotic plant that is a moderate problem in Georgia natural areas through invading native plant communities and displacing native species, but to a lesser degree than category 1 species". Excerpt from Forest Service reference - "As of 2008, thorny-olive was considered a severe threat by the South Carolina Exotic Pest Plant Council. Severe threat species are those known to severely threaten the composition, structure, or function of natural areas [46]. Thorny-olive is also listed as a moderate or significant threat to natural areas by other southern states including Tennessee [49], Georgia [20], and Florida [18]".

Reference(s):

- Georgia Invasive Species Task Force (0). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force- LIST.
- USDA Plants Database (0). Plants Profile for Elaeagnus pungens (thorny olive)- USDA distribution map.
- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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:

Invasive in Florida and Tennesee, of which are both a climate match to the region of concern. E. pungens is included on the GA EPPC list as an "Exotic plant that is a moderate problem in Georgia natural areas through invading native plant communities and displacing native species, but to a lesser degree than category 1 species".

Reference(s):

- Georgia Invasive Species Task Force (0). List of Non-native Invasive Plants in Georgia - Georgia Invasive Species Task Force- LIST.
- USDA Plants Database (0). Plants Profile for Elaeagnus pungens (thorny olive)- USDA distribution map.
- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

E. umbellata is classified as an invasive and banned in Connecticut, Massachusetts and New Hampshire. It is also stated as a noxious weed in West Virginia. Distribution for Elaegnus umbellata is more far spread than E.pungens, however distribution across the southeast is similar. Elaegnus umbellata is distributed in several southern states (South Carolina, Alabama, Mississippi, and Louisiana) that are a climate match for the region of concern. Excerpt taken from the Weed of the Week resource - "It is reported invasive in CT, DC, DE, FL, GA, IL, IN, KY, MD, MI, MO, NC, NH, NJ, NY, OH, PA, RI, TN, VA, VT, and WI".

Reference(s):

- USDA Plants Database (0). Plants Profile for Elaeagnus pungens (thorny olive)- USDA distribution map.
- USDA Plants Database (0). Plants Profile for Elaeagnus umbellata (autumn olive)- USDA.
- Munger, G. T. (2003). Weed of the Week US FS- Autumn olive Elaegnus umbellata.

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

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

Answer / Justification:

To answer this question I am attempting to match distribution records from the CABI and USDA respources with the highlighted areas in the climate match tool. Below are my findings and assumptions. United states = Yes, distribution matches many areas highlighted as a climate match by the PRE tool. Germany=unclear. Parts of the country are climate matches but distribution on CABI is not clear as to where the records are located. Italy=Not a climate match according to the PRE tool. New Zealand=Distribution is spread across both north and south islands with a concentration on the north island, CABI distribution is not clear, but i will have an educated guess that it's a match for distribution and climate match zone, as the majority of both islands are a match. Netherlands=Not a climate match Argentina=Only small portions of Argentina are a match in the climate match tool, distribution within the country not clear. Summary: I have answered yes to this question as the species is widely distributed, in the US, and most of its distribution matches tightly with the highlighted portions from the PRE tool. Additionally distribution matches the PRE climate tool in New Zealand. I have left the Confidence Level to Low as there are several other countries that have E.pungens but are not a climate match to the region of concern.

Reference(s):

- CABI (0). Elaeagnus pungens (thorny olive)- CABI.
- USDA Plants Database (0). Plants Profile for Elaeagnus pungens (thorny olive)- USDA distribution map.

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:

Although E.pungens is a shrub, it can take the form of a climbing plant and grow over and shade out plants. Once the plant has been established it produces fast-growing stem sprouts which "scramble" through neighboring vegetation, climbing trees and leading to the displacement of native vegetation.

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (0). Elaeagnus pungens – UF/IFAS Center for Aquatic and Invasive Plants.
- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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

- 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:

Excerpt from the Forest Service reference - "The Virginia Firewise Landscaping Taskforce gave thorny-olive a "medium" flammability rating based on a combination of leaf moisture retention, leaf oil or resin content, litter and debris accumulation, foliage and dead branch production, branching architecture, landscape maintenance needs, and/or drought resistance [2]. Altered fire frequency, severity, and behavior in habitats invaded by thorny-olive were not described in the available literature."

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 **High** confidence in this answer based on the available literature.

Answer / Justification:

E. pungens has reported to have negative effects on birds who feed on the plants fruits. Mortality has been recorded for Cedar wax wings after feeding on fruits of E.pungens. Please note that this mortality is attributed to automobile induced death after feeding on fruits of thorny olive planted near roadways, not necessarily eating the fruits themselves. This kind of bird mortality has been recorded in several instances for several species. See excerpt below. Excerpt from Forest Service resource: "Thorny-olive fruits are a food source for many bird species. After cardinals, juncos, cedar waxwings, brown thrashers, and other small birds were observed feeding on thorny-olive fruits in Atlanta, Georgia, thorny-olive was suggested for use in southern farmland hedges and borders [13]. Two studies indicate that cedar waxwings are especially attracted to thorny-olive fruits and are susceptible to automobile-induced mortality near thorny-olive roadside plantings. The Virginia Fish and Wildlife Department discovered 145 dead cedar waxwings in a high-traffic area near Richmond where thorny-olive occurred. In a follow-up study, researchers found that European starlings, cedar waxwings, robins, and common grackles commonly fed in thorny-olive highway plantings. Almost 95% of birds were associated with medians that had viable thorny-olive fruits, and those without viable fruit supported very few birds. Bird densities peaked with peak fruit availability [57]. High cedar waxwing mortality was also reported along a highway with thorny-olive plantings in Brazos County, Texas. Between 8 March and 5 April, researchers found 298 dead cedar waxwings. The largest count, 133 dead cedar waxwings, was made on 11 March in an area with 25 individual thorny-olive shrubs planted over a 330-foot (100 m) distance. Researchers also found 2 dead mockingbirds and 1 dead red-winged blackbird [16]. "

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Many describe E.pungens as fast growing and weedy. Several sources indicate that root suckering or prolific stem sprouts are responsible for the development of dense thickets. Excerpt from Forest Service resource- "thorny-olive's growth rate and habit suggest that infestations could exclude native vegetation and restrict human and wildlife movements"

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

Reproductive Strategies (Questions 11 - 17)

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

- 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:

Sexual reproduction occurs in E.pungens, and fruits are dispersed via birds and animals. However, thorny olive can also produce vegetatively via stem sprouts.

Reference(s):

- UF/IFAS Center for Aquatic and Invasive Plants (0). Elaeagnus pungens – UF/IFAS Center for Aquatic and Invasive Plants.
- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 **Medium** confidence in this answer based on the available literature.

Answer / Justification:

when top cut plant will coppice, and additionally plant can sread vegetatively, but neither are the common method of reproduction.

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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:

Yes. Sexual reproduction and biotic dispersal by birds and animals is the most common form of reproduction

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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

Answer / Justification:

Excerpt from the US Forest Service Resource- "Actual fruit production and seed yield were not reported in the reviewed literature (as of February 2011). Studies do suggest, however, that seed production is variable. Davison [13] reports that fruit production can be delayed and reduced if winter temperatures are "exceptionally" cold. Based on field observations near thorny-olive roadside plantings in Virginia, researchers suggested that the timing and amount of thorny-olive fruit production vary from year to year."

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.

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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 / Justification:

Leave blank. Could not find sufficient information in the resources.

Reference(s):

- [Anonymous] .

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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: **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:

Excerpt from both resources attached "thorny-olive seeds do not germinate until the second spring following production"- taken from the US Forestry resource." set CL at medium as it was the only reference that mentioned germination conditions/requirements.

Reference(s):

- Gucker, C. L. (2011). Elaeagnus pungens- Forest service.
- Kattenhorn, J. (1984). Pacific Horticulture Society \textbar Three Shrubs for Fall Fragrance.

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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 **Medium** confidence in this answer based on the available literature.

Answer / Justification:

Excerpt taken from CABI resource "Where invasive in the USA it flowers in November-February and fruits in April-May"

Reference(s):

- CABI (0). Elaeagnus pungens (thorny olive)- CABI.

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: **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:

Main dispersal is by birds, there were limited references to long distances. It is assumed that both birds and animals disperse seed.

Reference(s):

- [Anonymous] .

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

- 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:

Main dispersal method is by birds

Reference(s):

- [Anonymous] .

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

Answer / Justification:

No evidence found in the literature that this plant is frequently dispersed this way.

Reference(s):

- [Anonymous] .

Total PRE Score

PRE Score: 18 -- Reject (high risk of invasiveness)
Confidence: 66 / 100
Questions answered: 18 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:

- Shelly Matthew Prescott January 4, 2018

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.

Issue ID # 3213

Date Created: May 16, 2017 - 8:44am
Date Updated: June 22, 2017 - 7:27am

Submitted by: Brian Jernigan

Status: Fixed
Type:
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

do the referenced automobile-induced mortality near thorny-olive roadside plantings count as a risk from the plant

Issue Resolution (Screener's Response to Issue)

I incorporated the stakeholders comments, and included in the answer that the mortality of the birds was atrributed to automobile induced death from thorny olive plantings near roadways. I included this in the comments for the question but have kept the answer as a YES.

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.