



***Plant Risk Evaluator -- PRETM
Evaluation Report***

Lantana camara -- Nevada

2023-2024 Western IPM Project

PRE Score: 17 -- High Potential Risk

Confidence: 80 / 100

Questions answered: 20 of 20 -- Valid (80% or more questions answered)

Privacy: Public

Status: Completed

Evaluation Date: January 16, 2024

This PDF was created on April 02, 2025

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Plant Evaluated

Lantana camara



Evaluation Overview

A PRE™ screener conducted a literature review for this plant (*Lantana camara*) 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

Lantana camara, also known as *Lantana strigocamara* (Florida Natural Areas Inventory, 2023) and known by the common names lantana or shrub verbena, is a perennial shrub native to Central and South America. *L. camara* was brought to the United states for landscaping, and it has since escaped cultivation and became naturalized and invasive in many countries along with many states in the U.S. This species has several invasive qualities that make its establishment successful such as prolific seed production, persistent seed bank, drought tolerance, and its ability to germinate throughout the year as long as there is moisture in the soil. All parts of this species are toxic to all animals and humans including livestock. It also has the ability to invade native habitats and form dense thickets. It decreases crop yield and profitability when it invades agricultural fields (University of Florida Center for Aquatic & Invasive Plants, 2016). This species has the ability to spread long distances due to water and animals transporting the seeds. Due to these traits, it might be a risk to Nevada as a possible invader.

General Information

Status: Completed

Screener: Whitney Nash

Evaluation Date: January 16, 2024

Plant Information

Plant: *Lantana camara*

Regional Information

Region Name: Nevada



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

Answer / Justification:

The species *Lantana camara*, also known as *Lantana strigocamara* (Florida Natural Areas Inventory, 2023), is native to central and South America (University of Florida, 2024) but has been found growing outside of cultivated areas in Australia, California, Florida, and other southern U.S. states (Institute for Systematic Botany, 2024, Lucid Central, 2016, Calflora, 2023). In Australia, it has invaded all suitable habitat with the current climate, but future climate changes indicate it might spread further across Australia (Thomas, S. E., 2015). It has invaded agricultural land and other habitats such as wetlands, dunes, and forests (University of Florida, 2024).

Reference(s):

- Florida Natural Areas Inventory (2023). *Lantana strigocamara*.
- Lucid Central (2016). Fact Sheet Index.
- Calflora (2023). *Lantana camara* L..
- Institute for Systematic Botany (2024). *Lantana strigocamara* .
- University of Florida Center for Aquatic & Invasive Plants (2024). *Lantana strigocamara*.
- Thomas, S. E. (2015). *Lantana camara* (lantana).

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



Answer / Justification:

There are some areas in Arizona, New Mexico, and Texas where this species is found and matches Nevada's climate (GBIF).

Reference(s):

- GBIF (2016). GBIF Backbone Taxonomy.
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

This species is listed as invasive in Florida and Hawaii and in other countries and continents such as parts of Australia, Guam, New Zealand, Argentina, parts of Asia, the Philippines, and Greece (Thomas, S.E., 2015). In parts of Australia such as Queensland, all *Lantana* species are category 3 restricted invasive plants and are prohibited from being given away, sold, or released into the environment (Queensland Government, 2024). In India, *Lantana camara* is reported to have expanded over 44% of forest understory habitat, restricting wildlife movement, smothering other vegetation, and impacting livelihoods (Mungi et al., 2020). However, it is unclear whether this species would be able to become invasive in Nevada's climate. It has not yet been noted as becoming invasive in either Nevada or California.

Reference(s):

- University of Florida Center for Aquatic & Invasive Plants (2024). *Lantana strigocamara*.
 - Queensland Government (2024). *Lantana camara*.
 - Mungi, N. Avinash, Qureshi Q., & Jhala Y. V. (2020). Expanding niche and degrading forests: Key to the successful global invasion of *Lantana camara* (sensu lato). *Global Ecology and Conservation*. 23, e01080.
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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: **No**, which contributes **0** point(s) to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

There are some reports of *lantana camara* in west Texas, New Mexico, and Arizona that match Nevada's climate. However, the number of reports appear relatively low compared to other states and countries by looking at the climate map. This plant is not considered invasive in Arizona, and seems to become invasive more likely in tropical and subtropical environments that are close to the ocean and have more moisture or humidity in the air (University of Arizona, 2012).

Reference(s):

- University of Arizona (2012). *Lantana camara*.
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5. Are other species of the same genus (or closely related genera) invasive in a similar climate?

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

Answer / Justification:

There is a species in the same genus called *Lantana montevidensis*, which is also considered invasive in some places such as Florida (University of Florida, 2015) but not considered invasive in a similar climate as Nevada.

Reference(s):

- University of Florida, IFAS (2015). Purple Trailing Lantana: A Newly Categorized Invasive Plant in Florida.
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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** point(s) to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

More than 50% of this species is not found in any region that matches Nevada according to the climate matching map.

Reference(s):

- [Anonymous] .
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

This species has the ability to displace native plants and form dense thickets, making it difficult for other species to survive (Texas Invasive Species Institute, 2014). A study on *Lantana camara* showed that as an invader plant, there was a negative relationship between *lantana camara* invaded areas and native plant species richness (Raphela, T. D., & Duffy K., 2022). This indicates that native plants are being replaced with *Lantana camara*.

Reference(s):

- Texas Invasive Species Institute (2014). *Lantana camara*.
- Raphela, T. D., & Duffy K. (2022). The Impact of *Lantana camara* on Invertebrates and Plant Species of the Groenkloof Nature Reserve, South Africa. *Zoological Studies*. 61(33), 1-10.



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

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

Answer / Justification:

A study on *Lantana camara* in subtropical and tropical rainforests found that *Lantana camara* is less ignitable than drier native rainforest plant species, but that "fuel bed depths, leaf litter depths, percentage cover by fuels and amount of medium-size class fuels were higher in dry rainforest invaded by *Lantana camara* than in non-invaded forests." This suggests that this species could be capable of changing fire regimes when it is an invader by shifting the distribution of fuels closer to the ground creating a more substantial fuel layer in the understory (Berry, C., 2011). CABI also lists that this species tolerates and/or benefits from fire (Thomas, S.E., 2015).

Reference(s):

- Berry, C. (2011). The invasive weed *Lantana camara* increases fire risk in dry rainforest by altering fuel beds. *Weed Research*. 51(9), 525-533.
 - Thomas, S. E. (2015). *Lantana camara* (lantana).
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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** point(s) to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The fruits and leaves are poisonous to animals and humans. This species can cause liver failure or even death in livestock animals such as cattle, sheep, goats or horses, and also in wild animals. The unripe fruit has also been known to poison human children who eat them (Texas Invasive Species Institute, 2014).

Reference(s):

- Texas Invasive Species Institute (2014). *Lantana camara*.



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 *screeners* has a **Very High** confidence in this answer based on the available literature.

Answer / Justification:

This species has the ability to form dense thickets while taking over a native ecosystem (Texas Invasive Species Institute, 2014). In one study, it was found that this species has specific allelopathic properties in which the chemicals released into the soil from this plant may suppress the regeneration of native species nearby by decreasing their germination and seedling growth and increasing their mortality (Kato-Noguchi, H., & Kurniadie D., 2021). This allelopathic property may promote its ability to form dense thickets and take over native ecosystems. This species forms extensive, dense and impenetrable thickets in forestry plantations, orchards, pasture land, waste land and in natural areas which indicates that this could impact the movement of animals or people in these areas that are typically intended for human or livestock use (Thomas, S. E., 2015).

Reference(s):

- Texas Invasive Species Institute (2014). *Lantana camara*.
 - Kato-Noguchi, H., & Kurniadie D. (2021). Allelopathy of *Lantana camara* as an Invasive Plant. *Plants* (Basel). 10(1028),
 - Thomas, S. E. (2015). *Lantana camara* (lantana).
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Reproductive Strategies (Questions 11 - 17)

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

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



Answer / Justification:

This species has the ability to spread vegetatively through adventitious shoots, especially through shallow lateral roots, following mechanical damage (Thomas, S. E., 2015). Another source states new plants are capable of producing new plants through the production of suckers, branches taking root after contacting the soil, or stem fragments or pieces of the crown being moved and dumped into other locations as well (BioNET-EAFRINET, 2024).

Reference(s):

- Thomas, S. E. (2015). *Lantana camara* (lantana).
 - BioNET-EAFRINET (2024). *Lantana camara* (Lantana).
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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: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The roots have an ability to form new shoots from detached root fragments which supports the ability to produce dense thickets vegetatively (Thomas, S. E., 2015). This occurs commonly in human-disturbed areas where this plant material may be spread. This species is known to commonly produce dense thickets through vegetative means. New plants are capable of producing new plants through the production of suckers, branches taking root after contacting the soil, or stem fragments or pieces of the crown being moved and dumped into other locations as well (BioNET-EAFRINET, 2024).

Reference(s):

- Thomas, S. E. (2015). *Lantana camara* (lantana).
 - BioNET-EAFRINET (2024). *Lantana camara* (Lantana).
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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 *screeners* has a **High** confidence in this answer based on the available literature.



Answer / Justification:

This species has the ability to germinate and flower year round and can germinate from wildlife eating the seeds and passing through the digestive tract as well (Texas Invasive Species Institute, 2014).

Reference(s):

- Texas Invasive Species Institute (2014). *Lantana camara*.
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

One plant can produce 12,000 fruits, in which each fruit is a 2-seeded drupe (Texas Invasive Species Institute, 2014), (Thomas, S. E., 2015).

Reference(s):

- Texas Invasive Species Institute (2014). *Lantana camara*.
 - Thomas, S. E. (2015). *Lantana camara* (lantana).
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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 *screeners* has a **Medium** confidence in this answer based on the available literature.



Answer / Justification:

There is conflicting evidence on the germination of *Lantana camara*. One study found that *Lantana camara* has a persistent seed bank as the results significantly showed that seed survival was high for buried seeds receiving natural rainfall (Vivian-Smith, G., & F. Panetta D., 2017). Another study showed that *Lantana camara* does not have any dormancy issues that prevent it from successfully germinating (Campbell, K., 2024). However, another study stated that seed germination is generally low, but greatly increases after being ingested, suggesting it doesn't have high rates of germination on its own (Australian Association of Bush Regenerators, 2024). Another study showed that there was less than 25% germination under control conditions (Raizada and Raghubanshi 2010).

Reference(s):

- Vivian-Smith, G., & F. Panetta D. (2017). *Lantana (Lantana camara) Seed Bank Dynamics: Seedling Emergence and Seed Survival*. *Invasive Plant Science and Management*. 2(2), 141-150.
 - Campbell, K. (2024). Germination of three selections of *Lantana* species.: *L. camara*, *L. camara* 'PinkCaprice', and *L. depressa*.
 - Australian Association of Bush Regenerators (2024). *Lantana (Lantana camara)*.
 - Raizada, P., & Raghubanshi A. Singh (2010). Seed germination behaviour of *Lantana camara* in response to smoke. *Tropical Ecology*. 51(2),
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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** point(s) to the total PRE score.
- The *screeners* has a **Medium** confidence in this answer based on the available literature.

Answer / Justification:

This species ability to become invasive is largely due to its seed and pollen production (Deng, Z., Czarnecki, II D. M., & Gong L., 2024). There isn't a lot of data about how long this species takes to produce viable seeds, but one study's findings on seed banking dynamics, suggest that *lantana* has a persistent seed bank and this should be considered in management programs (Vivian-Smith, G., & F. Panetta D., 2017). Taylor, S., Kumar L., & Reid N. (2012). *Lantana camara* has been reported to mature within less than one year of germination (Taylor and Reid 2012).



Reference(s):

- Deng, Z., Czarnecki, II D. M., & Gong L. (2024). Developing Genetic and Molecular Tools for Assessing and Controlling the Invasive Potential of *Lantana camara* and Protecting Native *Lantana*.
 - Australian Association of Bush Regenerators (2024). *Lantana* (*Lantana camara*).
 - Vivian-Smith, G., & F. Panetta D. (2017). *Lantana* (*Lantana camara*) Seed Bank Dynamics: Seedling Emergence and Seed Survival. *Invasive Plant Science and Management*. 2(2), 141-150.
 - Taylor, S., Kumar L., & Reid N. (2012). Impacts of climate change and land-use on the potential distribution of an invasive weed: a case study of *Lantana camara* in Australia. *Weed Research*. 52(5), 391–401.
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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: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

This plant can flower at any point in the year when sufficient moisture is present (Australian Association of Bush Regenerators, 2024). CABI states that flowering and fruiting can take place throughout the year with the peak being the first two months of the rainy season when the soil is the most moist (Thomas, S.E., 2015).

Reference(s):

- Australian Association of Bush Regenerators (2024). *Lantana* (*Lantana camara*).
 - Thomas, S. E. (2015). *Lantana camara* (*lantana*).
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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: **Yes**, which contributes **1** point(s) to the total PRE score.
- The *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

The seeds are dispersed easily by birds who eat the seeds (Thomas, S. E., 2015). Other animals are also known to eat the fruits which allows for long distance dispersal (Texas Invasive Species Institute, 2014).

Reference(s):

- Thomas, S. E. (2015). *Lantana camara* (lantana).
 - Texas Invasive Species Institute (2014). *Lantana camara*.
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

According to CABI, occasional long distance dispersal of *Lantana camara* by water will occur. It has been documented happening along flood plains and a river in South Africa (Thomas, S. E., 2015).

Reference(s):

- Thomas, S. E. (2015). *Lantana camara* (lantana).
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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 *screeners* has a **High** confidence in this answer based on the available literature.

Answer / Justification:

This species spreads mostly through animals, garden ornamental trade, or through layering, which is where horizontal stems take root when they are in contact with moist soil (Queensland Government, 2024).

Reference(s):

- Queensland Government (2024). *Lantana camara*.
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Evaluation Notes

Nikki Valentine and Jutta Burger revised the evaluation in response to issues (Nash was no longer available).

Total PRE Score

PRE Score: 17 -- High Potential Risk

Confidence: 80 / 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: 2023-2024 Western IPM 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:



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.



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.

PRE beta funding was provided by Sustainable Conservation (<https://www.suscon.org/>) and a USDA Farm Bill grant. Additional funding has been provided by the Western Integrated Pest Management Center.