Peruvian Primrose (*Ludwigia peruviana*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2024
Revised, March 2025
Web Version, 3/16/2026

Organism Type: Plant
Overall Risk Assessment Category: High

Photo: Forest and Kim Starr. Licensed under Creative Commons BY 3.0. Available: https://www.biolib.cz/en/image/id51350/ (January 2024).

1 Native Range and Status in the United States

Native Range

From Wishah and Schroeder (2026):

"*Ludwigia peruviana* is native to South America […] (Chandrasena et al. 2002)."

GISD (2024), lists *Ludwigia peruviana* as native in Argentina, Belize, Bolivia, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela. Wishah and Schroeder (2026) indicate that Puerto Rico is also part of the native range of *Ludwigia peruviana*.

Status in the United States

Wishah and Schroeder (2026) indicate that Puerto Rico is part of the native range of *Ludwigia peruviana*.

From Wishah and Schroeder (2026):

"Established throughout Florida and southern Georgia (Godfrey and Wooten, 1981) but is common south of Gainesville, FL (Nelson, 1996)."

Wishah and Schroeder (2026) also report non-native occurrences of *Ludwigia peruviana* in South Carolina with a status of 'established.'

From Reid et al. (2024):

"We report *Ludwigia peruviana* new to Louisiana based on a robust population along the West Pearl River in the southeastern part of the state. We also discovered an overlooked Louisiana record from near the mouth of the Mississippi River made at the turn of the 20th century and note that recent iNaturalist observations apparently show the species from several other localities in the state."

From Alpaca (2012):

"In 2008 the author found a population [of *Ludwigia peruviana*] thriving in a wetland area of Hermann Park in Houston. There were several shrubs about 2.5 m tall and the plants were observed spreading over the following several years. This is the first record in Texas outside the single collection from Terrell County."

Keener et al. (2026) list *Ludwigia peruviana* as present and not native in southern counties in Alabama.

Lot (2004) lists *Ludwigia peruviana* as present in coastal areas of Mississippi.

Ludwigia peruviana is in trade within the United States (e.g., Mangoneon 2024; R&B Floridaseeds 2024).

Regulations

Ludwigia peruviana is regulated in California (CDFA 2021). Please refer back to state agency regulatory documents for details on the regulations, including restrictions on activities involving this species. While effort was made to find all applicable regulations, this list may not be comprehensive. Notably, it does not include regulations that do not explicitly name this species

or its genus or family, for example, when omitted from a list of authorized species with blanket regulation for all unnamed species.

Means of Introductions within the United States

From Wishah and Schroeder (2026):

"While it is unsure how *L. peruviana* was introduced in the Unites States, it was likely introduced in many parts of the world for ornamental uses and as botanical specimens. It continures [sic] to spread via its many, highly viable, seeds as well as from stem fragments (Chandrasena 2005; Parsons and Cuthbertson 2001). […] Tiny seeds of *L. peruviana* are commonly transported on the feathers of birds or unknowingly through human clothing, hats, and hair (Jacobs et al. 1994)."

Remarks

This ERSS was previously published in August 2018. Revisions were completed to incorporate new information and conform to updated standards.

There is conflicting information regarding the native or introduced status of *Ludwigia peruviana* in Florida (e.g., Herwitz and Wunderlin 1990; Clewell 1999; Wishah and Schroeder 2026) and Puerto Rico (e.g., GISD 2024; Wishah and Schroeder 2026).

From Chandrasena (2005):

"All municipalities in the Sydney basin [Australia] have now declared *L. peruviana* a noxious plant, to be controlled within their local government areas."

Mention of commercial products in this Ecological Risk Screening Summary does not entail endorsement by the U.S. Federal Government.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2024):

Kingdom Plantae
Subkingdom Viridiplantae
Infrakingdom Streptophyta
Superdivision Embryophyta
Division Tracheophyta
Subdivision Spermatophytina
Class Magnoliopsida
Superorder Rosanae
Order Myrtales
Family Onagraceae
Genus *Ludwigia*

Species *Ludwigia peruviana*

According to WFO (2025), *Ludwigia peruviana* (L.) H.Hara is the current accepted name for this species.

The following synonyms of *Ludwigia peruviana* from Wishah and Schroeder (2026) were used to search for information for this report*: Jussiaea grandiflora L., Jussiaea hirta, Jussiaea macrocarpa, Jussiaea peruviana, Jussiaea speciosa, Jussiaea sprengeri, Ludwigia hirta, Oenothera hirta*.

Size, Weight, and Age Range

From Chowdhury et al. (2013):

"Perennial, marshland shrubs, upto [sic] 4 m high […]"

Environment

From Wishah and Schroeder (2026):

"Shallow water in ditches and canals, as well as marshy areas (Godfrey and Wooten, 1981; Nelson, 1996). […] *Ludwigia peruviana* does not perform well in saline conditions (Jacobs et al., 1993). […] Lateral roots form white spongy vertical pneumatophores in shallow water to adapt to anoxic conditions (Parsons and Cuthbertson 2001; Ellmore 1981)."

From Chandrasena (2005):

"[…] tolerance of conditions from sea level to > 1450 m altitude […]"

Climate

From Chandrasena (2005):

"In Australia, infestations south of Sydney, in Sutherlandshire, latitude ≈30° South, are the southern-most limit of its current spread. […] pantropical occurrence, across several continents […]"

From Barua et al. (2017):

"Raven's [Raven 1963] revisionary work on Old World *Ludwigia* and subsequent records revealed its introduction and evidences of naturalization […] extending nearly up to 35º lat. in the southern and northern hemispheres."

From Wishah and Schroeder (2026):

"*Ludwigia peruviana* senesces in extreme cold (Godfrey and Wooten, 1981)."

Distribution Outside the United States

Native

From Wishah and Schroeder (2026):

"*Ludwigia peruviana* is native to South America […] (Chandrasena et al. 2002)."

GISD (2024) lists *Ludwigia peruviana* as native in Argentina, Belize, Bolivia, Brazil, Cayman Islands, Chile, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela.

A portion of the species' native range is within the United States, see section 1.

Introduced

From Chowdhury et al. (2013):

"Distribution: India (Nilgiri hills of South India, South Andaman, Assam, West Bengal), Indonesia (Java, Sumatra), Malaysia, Singapore, Sri Lanka, […]"

From Barua et al. (2017):

"The range of distribution of this plant in India includes marshy areas in Tamil Nadu, Kerala [Paul 1998; Barua 2010], South and Little Andaman [Sampath-Kumar and Dreekumar 2000; Rasingam 2010], and West Bengal [Choudhury et al. 2013], showing mild aggression in these regions. The species was first seen in Assam, North East India, in 1993 in Karbi Anglong district [AICRP 1996; Baura 2010]. […] However, during the last five years, it has become rather aggressive with tremendous population explosion in Karbi Anglong and its foot hills […]"

From Chandrasena (2005):

"*Ludwigia peruviana* (Primrose Willow; Family: Onagraceae), […], has become a significant aquatic weed in eastern Australia, mainly in the Sydney basin."

"Since 1971, when *L. peruviana* was first recorded in Botany Wetlands in Sydney, it has spread widely from the initial infestation."

"By late-1980s, infestations were found in Heathcote, about 40 km south of Sydney, and in Gosford, about 80 km north of Sydney (Jacobs et al 1993)."

From Dike et al. (2012):

"[…] *Ludwigia peruviana* was only found in water-laden regions [in Nigeria]."

From Turner (2021):

"Although Ummul-Nazarah (2017) noted the occurrence of *Ludwigia peruviana* in Sabah and Sarawak [Malaysia], she did not cite any specimens. I have seen collections from Kalimantan [Indonesia] (Leeuwenberg 13381, Ambri & Arifin A.A.455, Arbainsyah AA1861) that confirm the species is naturalized in Borneo."

Additionally, according to POWO (2024), *Ludwigia peruviana* is introduced into Mauritius, the Society Islands (French Polynesia), and Thailand. GISD (2024) reports *Ludwigia peruviana* as alien in the Dominican Republic, Nicobar Islands (India), and French Polynesia.

Means of Introduction Outside the United States

From Chandrasena (2005):

"Humans introduced *L. peruviana* to Australia; it was cultivated at the Botanic Gardens in Sydney in 1907 (Jacobs et al 1994), possibly after introduction to Australia from South East Asia by botanists."

From GISD (2024):

"Machinery used to modify creeks and wetlands is also known to be a significant method of causing spread (The Sydney Olympic Park Authority, 2004). The Sydney Weeds Committees (Undated) reports that seeds from their capsules could fall into water from where they can disperse down stream. The number of seeds below dense *L. peruviana* can be over 300 000 per sq metre."

Short Description

From Chowdhury et al. (2013):

"Stem cylindric, hollow, much branched. Thread like pneumatophores arises from submerged roots. Lamina lanceolate or broadly ovate – lanceolate, entire, acute or sub – acuminate, base narrowly cuneate, coriaceous, lateral nerves 12 – 22 on either side of midrib; petioles 5.6 – 6.1 cm long, 0.7 – 1.1 cm wide. Flowers solitary in upper leaf axils, showy, pedicels quadrangular, 2.6 – 3.5 cm long, villous; bracteoles 2, 1.2 mm – 1.5 mm long, reduced or subulate, borne at sepal base. Sepals 4 (or 5), lanceolate to subulate or deltoid – acuminate, 1.4 – 2.2 x 0.5 – 1 cm, margin irregularly serrulate, fleshy, villous outside, glabrous inside, 9 – nerved. Petals 4 (or 5), sub – orbicular, 1.6 – 2.5 x 1.5 – 2.6 cm, shortly clawed, shallowly emarginate, yellow with brownish nerves. Stamens 8 or 10, subequal, yellow, filaments 1.4 – 3.1 mm long, anthers 1.8 – 3.2 mm long, apparently basifixed by reduction; disc much elevated; nectaris depressed, U- or C-shaped, densely white hairy, surrounding the base of stamens. Ovary quadrangular, 9 – 11 mm long, pubescent, 4-loculed, ovules numerous in each locule; style 1 mm long, thick, stigma elongated-hemispherical to ellipsoid, longer than style, 3 mm across. Capsules sharply quadrangular, villous, 2.5 – 3.4 long, with 4 prominent deep brown ribs, villous, irregularly loculicidal. Seeds pluriseriate, free, ellipsoid, 0.60 x 0.90 x 0.37 mm, with a prominent nipple and transversely striped integument, brown, raphe 0.74 x 0.16 mm."

Biology

From Chandrasena (2005):

"Mature *L. peruviana* stands in Botany Wetlands produced ≈ 450,000 seeds m^{-2} (Jacobs et al 1994). In addition, there were ≈ 65,000 seeds m^{-2} in the soil seed bank and ≈ 300,000 seeds m^{-2} in old fruits, which remained on stems over winter."

"Young plants flowered within two years. Within a year, there are two periods of flowering (spring and late summer) in Sydney. Seed viability was extremely high, in the range of 80-99% in the first year, declining significantly within 2 years (Jacobs et al 1993). The small seeds germinate readily in mud throughout spring and summer."

"There was some evidence of dormancy, possibly due to the hard-seed component of the seed bank, but this appears to break down after about one year (Jacobs et al 1993)."

"The seeds of *L. peruviana* are hydrophobic, which make them germinate while afloat or underwater (Jacobs et al 1993). But the seedlings eventually float to the surface for establishment along shorelines, and also allow *L. peruviana* to form floating islands."

From Barua et al. (2017):

"Seeds are light (1000 seed weight = 2.8 to 5.2 mg), small in size and possess above 90% viability. […] Vegetative regeneration also occurs from the fragmented stems and branches."

Human Uses

From Dike et al. (2012):

"The investigations revealed that a total of 22 species namely […], *Ludwigia peruviana* (L.) Hara., […], are used in the treatment of malaria in the south-western regions of Nigeria."

Diseases

No information was found on diseases associated with *Ludwigia peruviana*.

Threat to Humans

From GISD (2024):

"*Ludwigia peruviana* is vigorously opportunistic, clogging waterways […] (The Sydney Weeds Committees, Undated)."

3 Impacts of Introductions

From GISD (2024):

"*Ludwigia peruviana* is vigorously opportunistic, clogging waterways and dominating other water and creek bank vegetation (The Sydney Weeds Committees, Undated)."

From Barua et al. (2017):

“In the study area [northeast India], where the wetlands (peatlands and stream beds) and ecotones (marshlands) were infested by primrose-willow [*Ludwigia peruviana*], there was major reduction in the size of indigenous plant community. It was more severe in the marshlands, where the weed attained a near climax state […]. Such a situation triggered not only the elimination of several resident plant species and increased vulnerability of several other habitat-sensitive plants, but also pose a threat to several animals […] and other organisms of the ecosystem. The extensive occurrence of primrose-willow has severely disturbed the normal food web of the threatened biota.”

From Chandrasena (2005):

“Dense stands of *L. peruviana* intercepted 93% of incident light (Jacobs et al. 1993), which led to dramatic losses of smaller native freshwater wetland plants and a reduction in bird populations.”

“In the interconnected Botany Ponds, dense *L. peruviana* stands choked water flow between ponds and increased sedimentation.”

“Reduced water flow increased the risk of flooding of adjacent properties. The addition of vast amounts of organic material, over decades, led to deoxygenation of ponds and wide ranging ecological damage. Recurrent toxic blue-green algal blooms were common in the ponds, which indicated, nutrient enrichment and a breakdown of natural food webs. These adverse changes threatened cultural, social, aesthetic and economic values of the Botany Wetlands (Chandrasena and Sim 1998). Negative social impacts included reduced opportunity for recreational use by the public.”

From Chandrasena et al. (2002):

“In the 1990s [in Botany Wetlands, Sydney], dense *L. peruviana* infestations extended deeply into the ponds covering an estimated 40% of the wetland area, aggressively choking out most other native species (GHD, 1993, Jacobs et al. [1994]).”

Ludwigia peruviana is regulated in California (CDFA 2021). See section 1.

4 History of Invasiveness

The History of Invasiveness for *Ludwigia peruviana* is classified as High. There are records of nonnative introductions in parts of Oceania, Asia, and North America. These introductions have resulted in established populations. There is information regarding negative impacts from these *Ludwigia peruviana* establishments. The negative impacts include modification of hydrology, modification of soil quality, habitat degradation, disturbed food webs, and overcrowding and reduction in abundance of native plant species. These impacts are documented from reliable sources.

5 Global Distribution

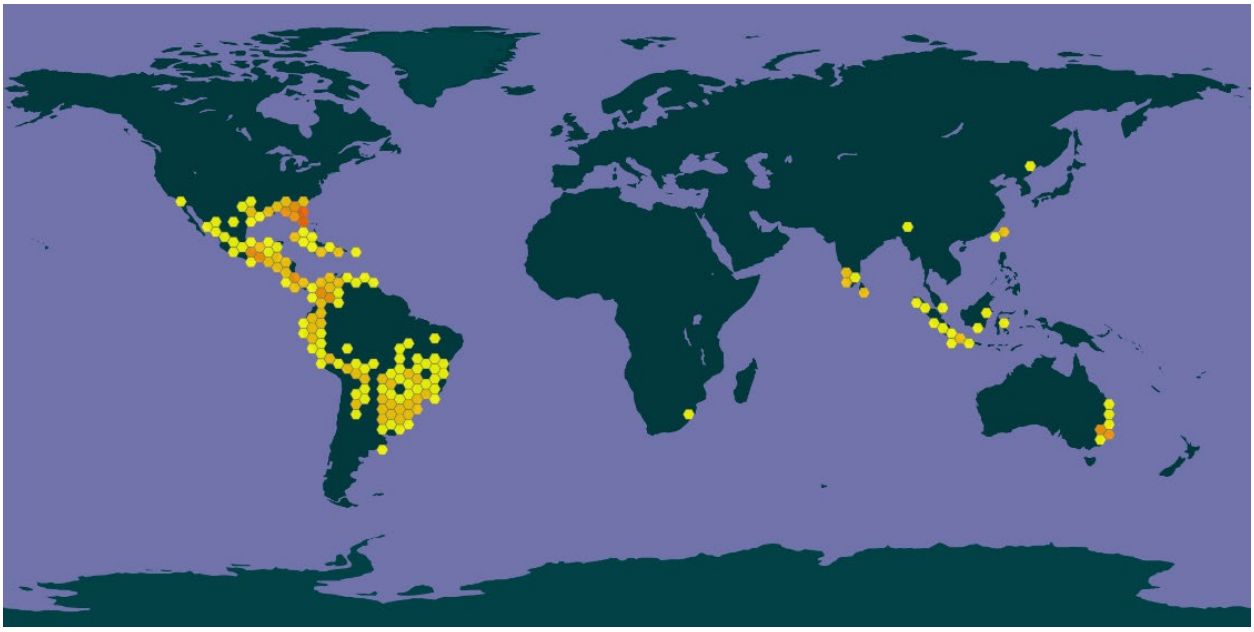

Figure 1. Reported global distribution of *Ludwigia peruviana*. Map from GBIF Secretariat (2023). Observations are reported from North and South America, southern and eastern Asia, eastern Australia, and South Africa. Points in South Africa, North Korea, and some observations in the United States (see section 6) do not represent established wild populations and therefore were not included in the climate matching analysis. No evidence of *L. peruviana* presence in Taiwan was found, therefore, those observations were also not used in the climate matching analysis.

Chowdhury et al. (2013) provided additional locations in India.

No georeferenced observations were found to represent the potential populations in Nigeria (Dike et al. 2012).

6 Distribution Within the United States

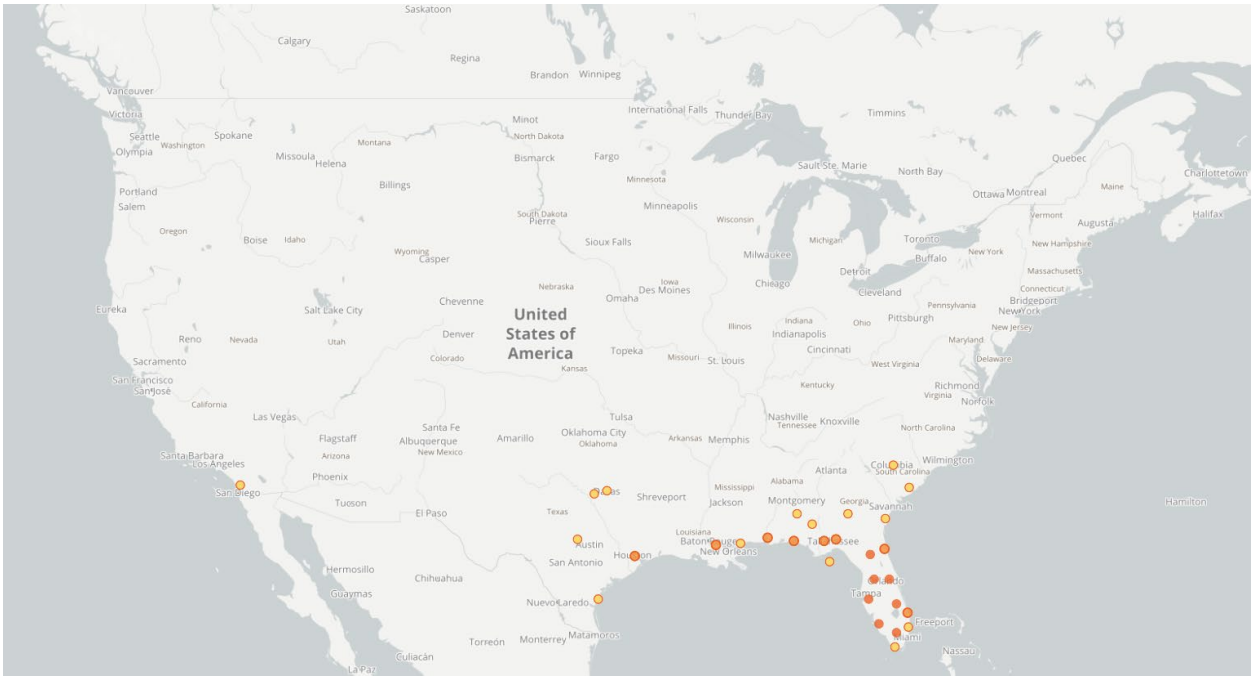

Figure 2. Reported distribution of *Ludwigia peruviana* in the United States. Map from GBIF-US (2024). Observations are reported from Florida, Georgia, Alabama, Mississippi, Louisiana, Texas, and South Carolina. The point in southern California does not represent an established population and therefore was not used in the climate matching analysis.

Ried et al. (2024) provided an additional observation in Louisiana.

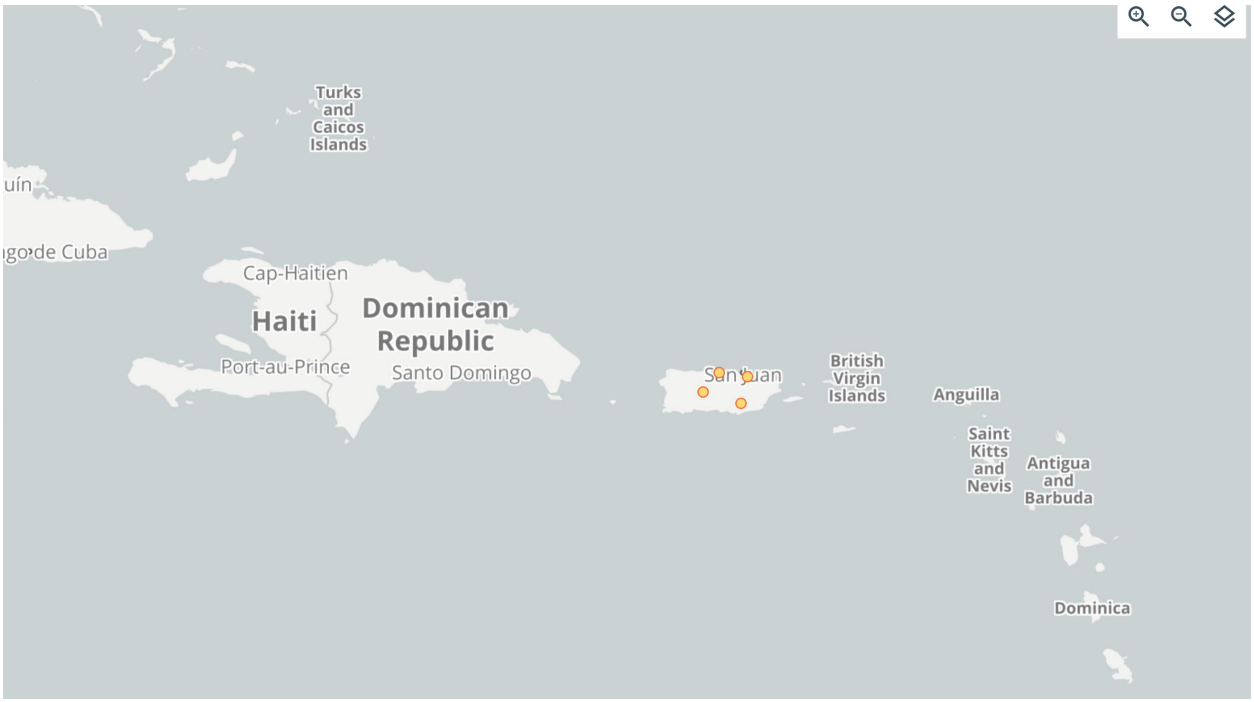

Figure 3. Known distribution of *Ludwigia peruviana* in Puerto Rico. Map from GBIF-US (2024).

7 Climate Matching

Summary of Climate Matching Analysis

The climate match analysis for *Ludwigia peruviana* to the contiguous United States found areas of high climate match in the Southeast, from central Texas to southeastern Virginia. Areas with medium climate match included the Ohio River Basin, the southern Great Lakes Basin, and other parts of the Midwest. Patches of medium match were found in the Southwest. Areas with low climate match included most of the West and New England regions. The overall Climate 6 score (Sanders et al. 2023; 16 climate variables; Euclidean distance) for the contiguous United States was 0.490, indicating that Yes, there is establishment concern. The Climate 6 score is calculated as: (count of target points with scores ≥ 6)/(count of all target points). Establishment concern is warranted for Climate 6 scores greater than or equal to 0.002 based on an analysis of the establishment success of 356 nonnative aquatic species introduced to the United States (USFWS 2024).

Projected climate matches in the contiguous United States under future climate scenarios are available for *Ludwigia peruviana* (see Appendix). These projected climate matches are provided as additional context for the reader; future climate scenarios are not factored into the Overall Risk Assessment Category.

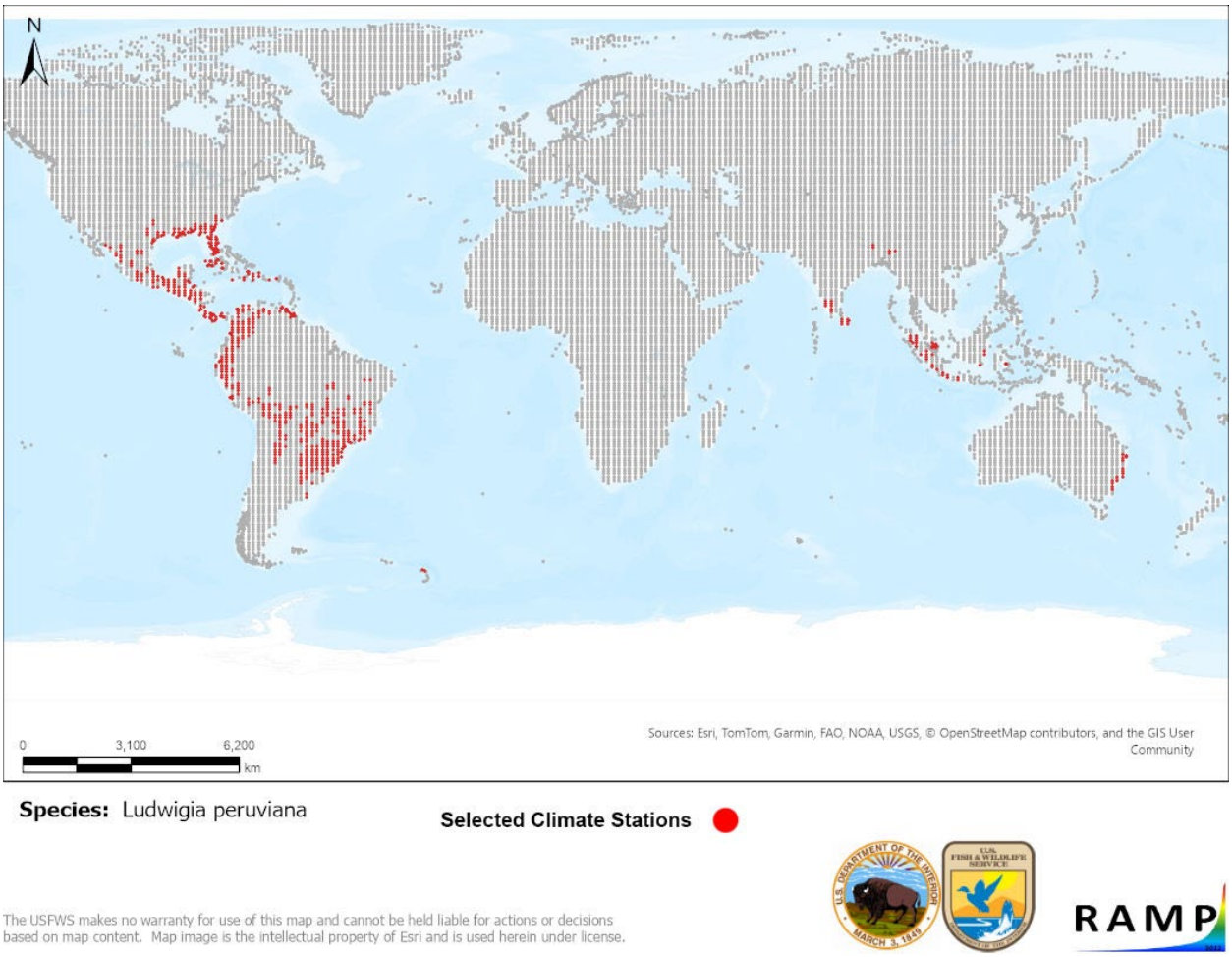

Figure 4. RAMP (Sanders et al. 2023) source map showing weather stations in North and South America, southern Asia, and Australia as selected as source locations (red; Argentina, Australia, Bangladesh, Belize, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, India, Indonesia, Jamaica, Malaysia, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Singapore, South Georgia and South Sandwich Islands, Sri Lanka, United States, Uruguay, and Venezuela) and non-source locations (gray) for *Ludwigia peruviana* climate matching. Source locations from Choudhury et al. (2013), GBIF Secretariat (2023), and Reid et al. (2024). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

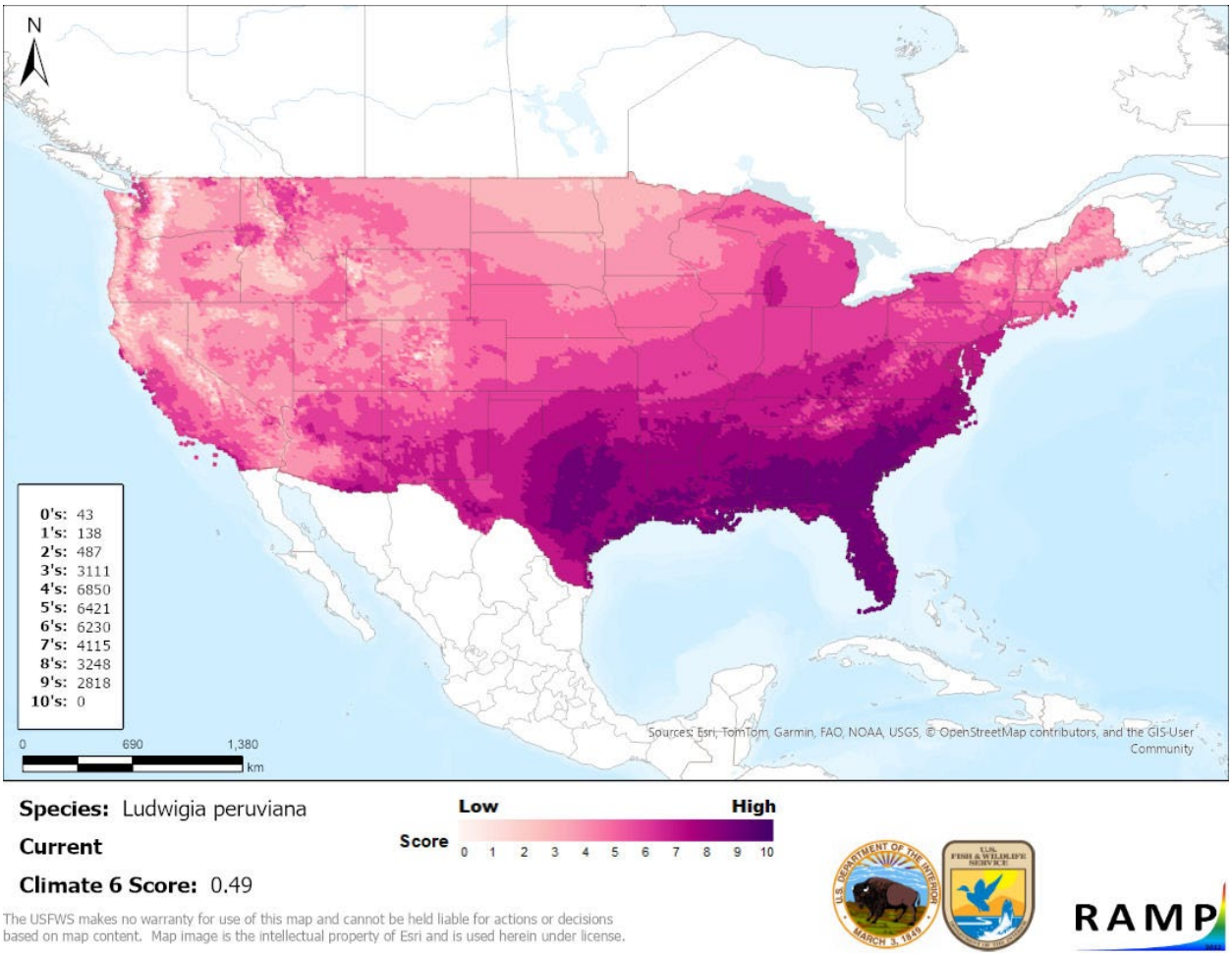

Figure 5. Map of RAMP (Sanders et al. 2023) climate matches for *Ludwigia peruviana* in the contiguous United States based on source locations reported by Choudhury et al. (2013), GBIF Secretariat (2023), and Reid et al. (2024). Counts of climate match scores are tabulated on the left. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

8 Certainty of Assessment

The Certainty of Assessment for *Ludwigia peruviana* is classified as High. Information was available from peer reviewed literature and other reliable sources on the biology, invasion history, and impacts of introduction for *Ludwigia peruviana*. There was enough information available to describe the risks posed by this species.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Ludwigia peruviana, the Peruvian primrose, is a plant that is native to Central and South America and parts of the Caribbean, including Puerto Rico. This species can grow in shallow water and in riparian areas. *L. peruviana* has been introduced to the southeastern United States, Australia, southern Asia, and possibly southern Africa. It has established populations in many of

those locations, including the southeastern United States. The species has been introduced via botanical plantings and has spread through seed contamination and natural dispersal. This aquatic plant has been highly successful supplanting native vegetation in ecosystems in India. It has impacted native ecosystems and altered hydrology in Australia. The History of Invasiveness for *Ludwigia peruviana* is classified as High. The climate matching analysis for the contiguous United States indicates establishment concern. Areas of high climate match were found primarily in the Southeast, which includes coastal areas with known established *Ludwigia peruviana* populations. The Certainty of Assessment for this ERSS is classified as High due to the availability of peer-reviewed information on documented impacts of introductions. The Overall Risk Assessment Category for *Ludwigia peruviana* in the contiguous United States is High.

Assessment Elements

- **History of Invasiveness (see Section 4): High**
- **Establishment Concern (see Section 7): Yes**
- **Certainty of Assessment (see Section 8): High**
- **Remarks, Important additional information: No additional information.**
- **Overall Risk Assessment Category: High**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in section 11.

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11 Literature Cited in Quoted Material

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

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Appendix

Summary of Future Climate Matching Analysis

Future climate projections represent two Shared Socioeconomic Pathways (SSP) developed by the Intergovernmental Panel on Climate Change (IPCC 2021): SSP5, in which emissions triple by the end of the century; and SSP3, in which emissions double by the end of the century. Future climate matches were based on source locations reported by Choudhury et al. (2013), GBIF Secretariat (2023), and Reid et al. (2024).

Under the future climate scenarios (figure A1), on average, high climate match for *Ludwigia peruviana* was projected to occur in the Appalachian Range, Gulf Coast, Mid-Atlantic, Southeast, Southern Atlantic Coast, and Southern Florida regions of the contiguous United States. Areas of high match were reduced in size and moved northward between time step 2055 and 2085 under both SSP3 and SSP5. The Climate 6 scores for the individual future scenario models (figure A2) ranged from a low of 0.484 (model: MPI-ESM1-2-HR, SSP5, 2085) to a high of 0.702 (model: UKESM1-0-LL, SSP5, 2085). All future scenario Climate 6 scores were above the Establishment Concern threshold, indicating that Yes, there is establishment concern for this species under future scenarios. The Climate 6 score for the current climate match (0.490, figure 5) falls within the range of scores for future projections. The time step and climate scenario with the most change relative to current conditions was SSP5, 2085, the most extreme climate change scenario. Under one or more time step and climate scenarios, areas within the Northeast saw a large increase in the climate match relative to current conditions. Additionally, areas within the Appalachian Range, Colorado Plateau, Great Lakes, Mid-Atlantic, Northern Pacific Coast, Northern Plains, and Western Mountains saw a moderate increase in the climate match relative to current conditions. Under one or more time step and climate scenarios, areas within the Gulf Coast, Southeast, Southern Atlantic Coast, Southern Florida, and Southern Plains saw a moderate decrease in the climate match relative to current conditions. No large decreases were observed regardless of time step and climate scenarios. Additional very small areas of large or moderate change may be visible on the maps (figure A3). The magnitude of change from current conditions was more pronounced in time step 2085 than in time step 2055 under both scenarios, SSP3 and SSP5.

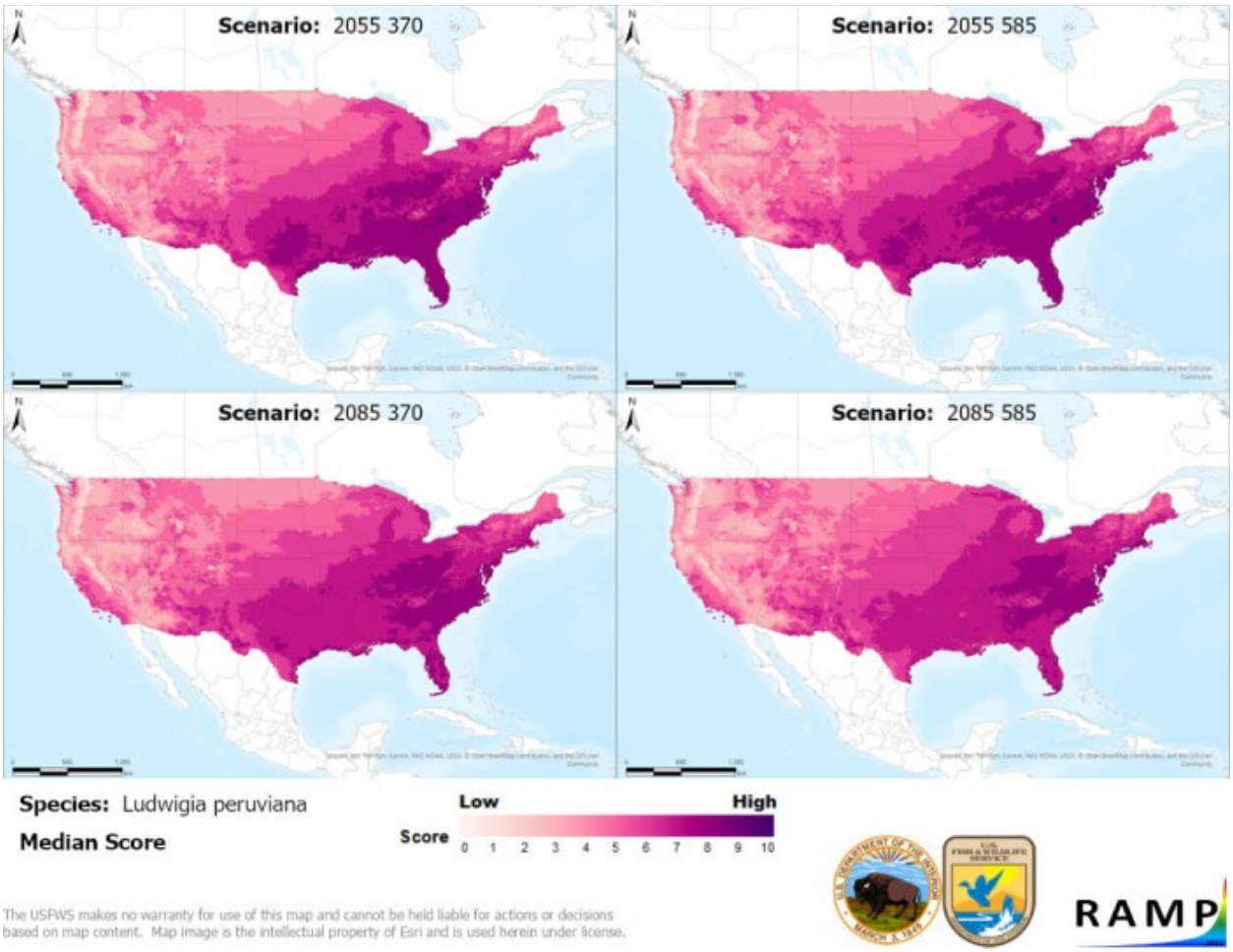

Figure A1. Maps of median RAMP (Sanders et al. 2023) climate matches projected under potential future climate conditions using five global climate models for *Ludwigia peruviana* in the contiguous United States. Climate matching is based on source locations reported by Choudhury et al. (2013), GBIF Secretariat (2023), and Reid et al. (2024). Shared Socioeconomic Pathways (SSPs) used (from left to right): SSP3, SSP5 (IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global climate models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0. 0/Pale Pink = Lowest match, 10/Dark Purple = Highest match.

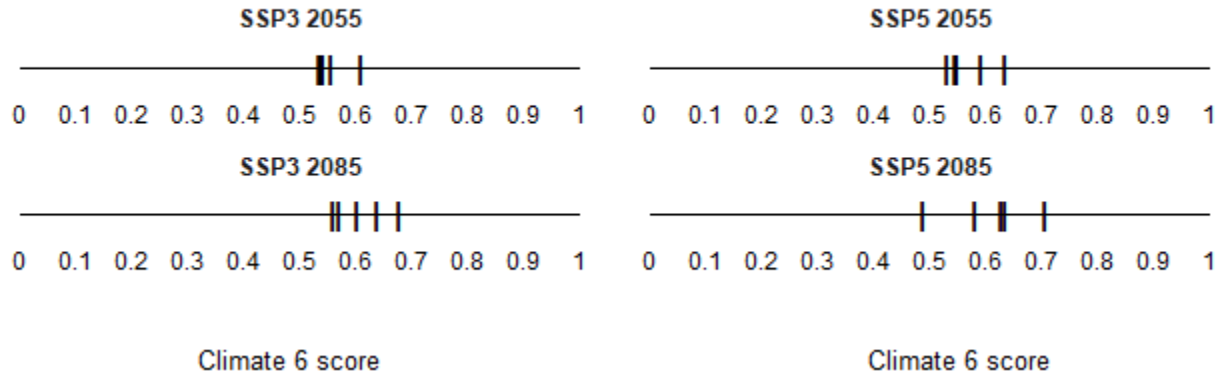

Figure A2. Comparison of projected future Climate 6 scores for *Ludwigia peruviana* in the contiguous United States for each of five global climate models under four combinations of Shared Socioeconomic Pathway (SSP) and time step. SSPs used (from left to right): SSP3, SSP5 (Karger et al. 2017, 2018; IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global climate models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0.

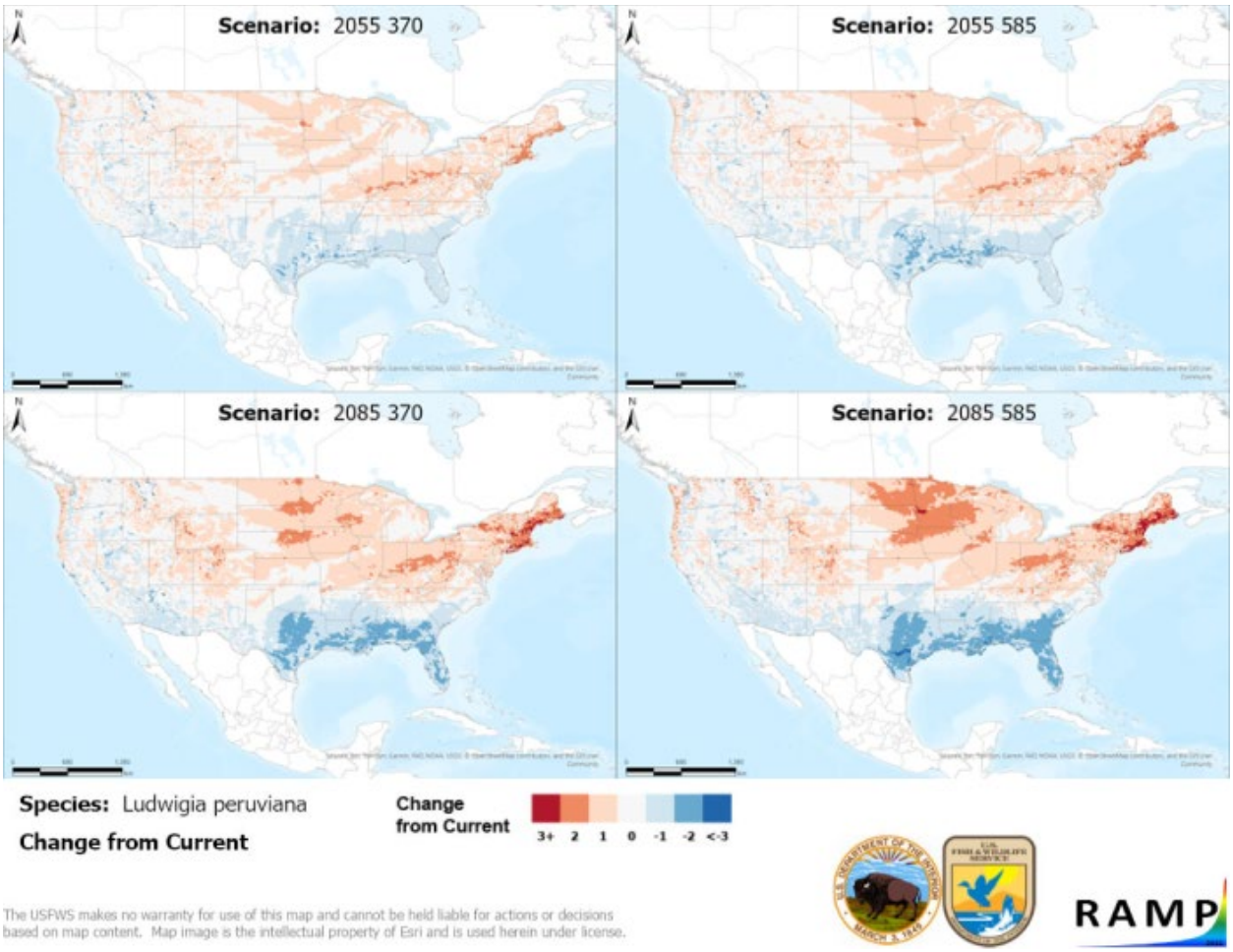

Figure A3. RAMP (Sanders et al. 2023) maps of the contiguous United States showing the difference between the current climate match target point score (figure 5) and the median target point score for future climate scenarios (figure A1) for *Ludwigia peruviana* based on source locations reported by Choudhury et al. (2013), GBIF Secretariat (2023), and Reid et al. (2024). Shared Socioeconomic Pathways (SSPs) used (from left to right): SSP3, SSP5 (IPCC 2021). Time steps: 2055 (top row) and 2085 (bottom row). Climate source data from CHELSA (Karger et al. 2017, 2018); global models used: GFDL-ESM4, UKESM1-0-LL, MPI-ESM1-2-HR, IPSL-CM6A-LR, and MRI-ESM2-0. Shades of blue indicate a lower target point score under future scenarios than under current conditions. Shades of red indicate a higher target point score under future scenarios than under current conditions. Darker shades indicate greater change.

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