

***Ludwigia perennis* (a plant, no common name)**

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, March 2021

Revised, March 2021

Web Version, 7/30/2021

Organism Type: Plant

Overall Risk Assessment Category: Uncertain



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Generic. Available:

[https://commons.wikimedia.org/wiki/File:Ludwigia_perennis_\(1443980344\).jpg](https://commons.wikimedia.org/wiki/File:Ludwigia_perennis_(1443980344).jpg) (March 2021).

1 Native Range and Status in the United States

Native Range

From Diop and Rehel (2020):

“This species is native from tropical Africa through east and southeast Asia to Australia.”

“Afghanistan; Australia; Bangladesh; Benin; Bhutan; Botswana; Burkina Faso; Cambodia; Cameroon; Central African Republic; Chad; China; Congo; Congo, The Democratic Republic of the; Côte d'Ivoire; Eswatini; Ethiopia; Gambia; Ghana; Guinea; India (Punjab, Tamil Nadu, Maharashtra, Madhya Pradesh, Bihar, West Bengal, Goa, Rajasthan, Karnataka, Gujarat, Kerala,

Uttar Pradesh, Andhra Pradesh, Arunachal Pradesh, Orissa, Sikkim, Assam, Manipur); Japan; Kenya; Lao People's Democratic Republic; Liberia; Madagascar; Malawi; Malaysia; Mali; Mauritania; Mozambique; Myanmar; Nepal; New Caledonia; Niger; Nigeria; Pakistan; Papua New Guinea; Philippines; Senegal; Sierra Leone; Somalia; South Africa; South Sudan; Sri Lanka; Sudan; Taiwan, Province of China; Tajikistan; Tanzania, United Republic of; Thailand; Togo; Uganda; Uzbekistan; Viet Nam; Zambia; Zimbabwe”

Status in the United States

No records of *Ludwigia perennis* in trade or in the wild in the United States were found.

Means of Introductions in the United States

No records of *Ludwigia perennis* in the wild in the United States were found.

Remarks

Ludwigia perennis does appear on some aquarium websites as available for purchase, however, this species appears to have been misidentified. The only reliable information on trade of *L. perennis* comes from Diop and Rehel (2020) and Tropical Plants Database (2021), which has this species sold in India as medicine and in some of its native range in Africa, as food. No other reliable information on the status of this species in the trade was available.

According to World Flora Online, *L. perennis* has these synonyms: *Isnardia multiflora* Guill. & Perr., *Isnardia parviflora* (Roxb.) Kuntze, *Jussiaea caryophyllea* Lam., *Jussiaea perennis* (L.) Brenan WFO descriptions, *Ludwigia caryophyllea* (Lam.) Merr. & F.P. Metcalf, *Ludwigia multiflora* (Guill. & Perr.) Walp., and *Ludwigia parviflora* Roxb.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From CABI (2019):

“Domain: Eukaryota
Kingdom: Plantae
Phylum: Spermatophyta
Subphylum: Angiospermae
Class: Dicotyledonae
Order: Myrtales
Family: Onagraceae
Genus: *Ludwigia*
Species: *Ludwigia perennis*”

According to World Flora Online (2021), *Ludwigia perennis* is the accepted scientific name for this species.

Size, Weight, and Age Range

From World Flora Online (2021):

“Stems 20-100 cm tall, branched, subglabrous or minutely puberulous on younger parts. Petiole 2-15 mm, winged; leaf blade narrowly elliptic to lanceolate, 1-11 × 0.3-2.7 cm, lateral veins 6-12 per side, submarginal vein inconspicuous, base narrowly cuneate, apex subacute. Sepals 4, rarely 5, deltate, (1.3-)2-3.5 mm, glabrous or minutely puberulous. Petals yellow, elliptic, 1-3 × 0.7-2 mm. Stamens as many as sepals, or rarely more; filaments 0.3-0.7 mm; anthers 0.5-0.7 mm; pollen in tetrads. Style 0.7-1.5 mm; stigma globose. Capsule often nodding, pale brown, oblanceoloid, terete, 3-16(-19) mm, 2.5-5 mm in diam., thinly walled, readily and irregularly loculicidal, glabrous or puberulous, sessile or pedicel to 6 mm. Seeds in 2 or more rows per locule, free, brown with fine brown lines, 0.3-0.5 mm, raphe very narrow and inconspicuous.”

Environment

From Tropical Plants Database (2021):

“Wet sites such as flood plains, roadside ditches, muddy wallows, abandoned rice paddies; [...]”

From Diop and Rehel (2020):

“This is an annual species found in wet places, including sandy river beds, along streams, and in rice fields.”

From CABI (2019):

“Terrestrial”

“Freshwater”

Climate

From Tropical Plants Database (2021):

“[...] at elevations from near sea level to 1,200 metres in southern China”.

From Diop and Rehel (2020):

“It is found growing at an [sic] altitudes of up to 1,500 m.”

“[...] tropical [...]”

Distribution Outside the United States

Native

From Diop and Rehel (2020):

“This species is native from tropical Africa through east and southeast Asia to Australia.”

“Afghanistan; Australia; Bangladesh; Benin; Bhutan; Botswana; Burkina Faso; Cambodia; Cameroon; Central African Republic; Chad; China; Congo; Congo, The Democratic Republic of the; Côte d'Ivoire; Eswatini; Ethiopia; Gambia; Ghana; Guinea; India (Punjab, Tamil Nadu, Maharashtra, Madhya Pradesh, Bihar, West Bengal, Goa, Rajasthan, Karnataka, Gujarat, Kerala, Uttar Pradesh, Andhra Pradesh, Arunachal Pradesh, Orissa, Sikkim, Assam, Manipur); Japan; Kenya; Lao People's Democratic Republic; Liberia; Madagascar; Malawi; Malaysia; Mali; Mauritania; Mozambique; Myanmar; Nepal; New Caledonia; Niger; Nigeria; Pakistan; Papua New Guinea; Philippines; Senegal; Sierra Leone; Somalia; South Africa; South Sudan; Sri Lanka; Sudan; Taiwan, Province of China; Tajikistan; Tanzania, United Republic of; Thailand; Togo; Uganda; Uzbekistan; Viet Nam; Zambia; Zimbabwe”

Introduced

According to GBIF Secretariat (2021), *L. perennis* was introduced in Sri Lanka and Uzbekistan. (Information originally from the Global Register of Introduced and Invasive Species, which was unavailable at the time of this screening.) However, *Ludwigia perennis* is recorded as native in those areas in Diop and Rehel (2020).

From Diop and Rehel (2020):

“It has been introduced to the Andaman Islands [India].”

Diop and Rehel (2020) list *L. perennis* as currently extant on the Andaman Islands.

According to Sudhakar Reddy (2008), *L. perennis* has been introduced to India and is not a native species.

Means of Introduction Outside the United States

No information on means of introduction have been reported.

Short Description

From Tropical Plants Database (2021):

“*Ludwigia perennis* is an erect, annual, taprooted plant with branched stems, growing 20 - 100cm tall [Flora of China 1994].”

From World Flora Online (2021):

“Stems 20-100 cm tall, branched, subglabrous or minutely puberulous on younger parts. Petiole 2-15 mm, winged; leaf blade narrowly elliptic to lanceolate, 1-11 × 0.3-2.7 cm, lateral veins 6-12 per side, submarginal vein inconspicuous, base narrowly cuneate, apex subacute. Sepals 4, rarely 5, deltate, (1.3-)2-3.5 mm, glabrous or minutely puberulous. Petals yellow, elliptic, 1-3 × 0.7-2 mm. Stamens as many as sepals, or rarely more; filaments 0.3-0.7 mm; anthers 0.5-0.7 mm; pollen in tetrads. Style 0.7-1.5 mm; stigma globose. Capsule often nodding, pale brown, oblongoid, terete, 3-16(-19) mm, 2.5-5 mm in diam., thinly walled, readily and irregularly

loculicidal, glabrous or puberulous, sessile or pedicel to 6 mm. Seeds in 2 or more rows per locule, free, brown with fine brown lines, 0.3-0.5 mm, raphe very narrow and inconspicuous.”

Biology

From Diop and Rehel (2020):

“This is an annual species found in wet places, including sandy river beds, along streams, and in rice fields.”

Human Uses

From Diop and Rehel (2020):

“The leaves of this species can be cooked and eaten as a vegetable. It is an important medicinal plant in Ayurveda and Siddha systems of medicine”.

From Tropical Plants Database (2021):

“The leaves are harvested from the wild for local use as a food. They are sometimes sold in local markets in west Africa [Achigan-Dako et al. 2009]”

From Selvamuthu et al. (2016):

“In the present study the methanolic extract of *Ludwigia perennis* leaves have been evaluated for potential antibacterial activities. Antibacterial activity of *Ludwigia perennis* were high enough to be known as new natural sources of antibacterial substances for use as natural remedy in bacterial infection. Hence, the inclusion of herbal extract in the cuisine will be helpful in preventing or slowing the bacterial growth”

Diseases

According to Poelen et al. (2014), *Ludwigia perennis* is a host of *Pseudocercospora jussiaeae* and *Pseudocercospora yoshinagiana*.

Threat to Humans

No information on threat to humans was found.

3 Impacts of Introductions

Records of introductions were found. However, no information on impacts of introductions was available.

4 History of Invasiveness

The history of invasiveness is classified as Data Deficient. This species has been reported as introduced to India, the Andaman Islands (a territory of India in the Bay of Bengal), Sri Lanka and Uzbekistan. There is uncertainty surrounding some of these introductions (India, Sri Lanka,

Uzbekistan) regarding if these locations are included in the native range. *L. perennis* is listed as extant in the Andaman Islands, no information on the establishment of the species in the other locations was found. No information on impacts of these introductions has been reported.

5 Global Distribution



Figure 1. Known global distribution of *Ludwigia perennis*. Observations are reported from Africa, Asia, Australia, and the Middle East. Map from GBIF (2021). The single location in South America will not be used in the climate match as it represents a preserved specimen and not a wild, established population.

No georeferenced observations were available to represent the introduction in Uzbekistan or the population in the Andaman Islands.

6 Distribution Within the United States

Ludwigia perennis has not been reported as introduced or established anywhere in the United States.

7 Climate Matching

Summary of Climate Matching Analysis

Most of the contiguous United States had a medium climate match with the match being higher along the southern border. The southern border with Mexico had a medium to high match while the Gulf Coast had a medium match. Peninsular Florida is also a high match. There were small areas of high match interior along the Pacific Coast. Low match was generally found along the Northwest coast, the northern central area of the United States and in the Northeast. The interior of the southeast, around Louisiana and Mississippi, extending north, had a low match. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.127, high (scores of 0.103 or greater are classified as high). The

following States had high individual Climate 6 scores: Arizona, California, Florida, Georgia, New Mexico, Oregon, South Carolina, Texas and Washington. Medium individual Climate 6 scores were found in Idaho, North Carolina, Nevada, Oklahoma, and Wyoming. All remaining States had low individual Climate 6 scores.

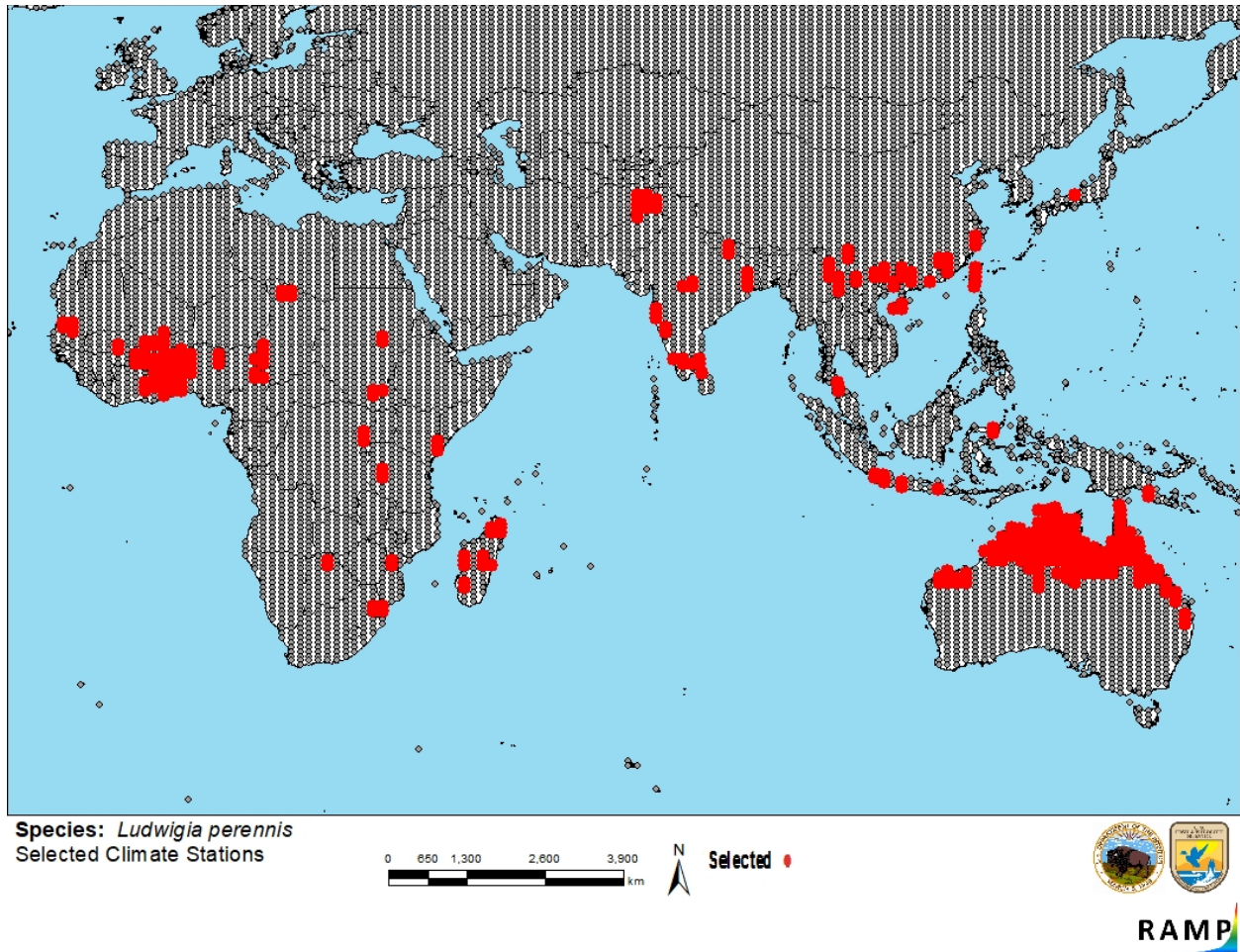


Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Africa, Asia, Australia, and the Middle East selected as source locations (red: Afghanistan; Australia; Benin; Bhutan; Botswana; Burkina Faso; Cameroon; Chad; China; The Democratic Republic of the Congo; Côte d'Ivoire; Eswatini; Gambia; Ghana; Guinea; India; Indonesia; Japan; Kenya; Laos People's Democratic Republic; Madagascar; Malaysia; Mali; Mauritania; Mozambique; Nepal; New Caledonia; Niger; Nigeria; Pakistan; Papua New Guinea; Senegal; South Africa; Sudan; South Sudan; Sri Lanka; Taiwan; United Republic of Tanzania; Thailand; Togo; Uganda) and non-source locations (gray) for *Ludwigia perennis* climate matching. Source locations from GBIF Secretariat (2021). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

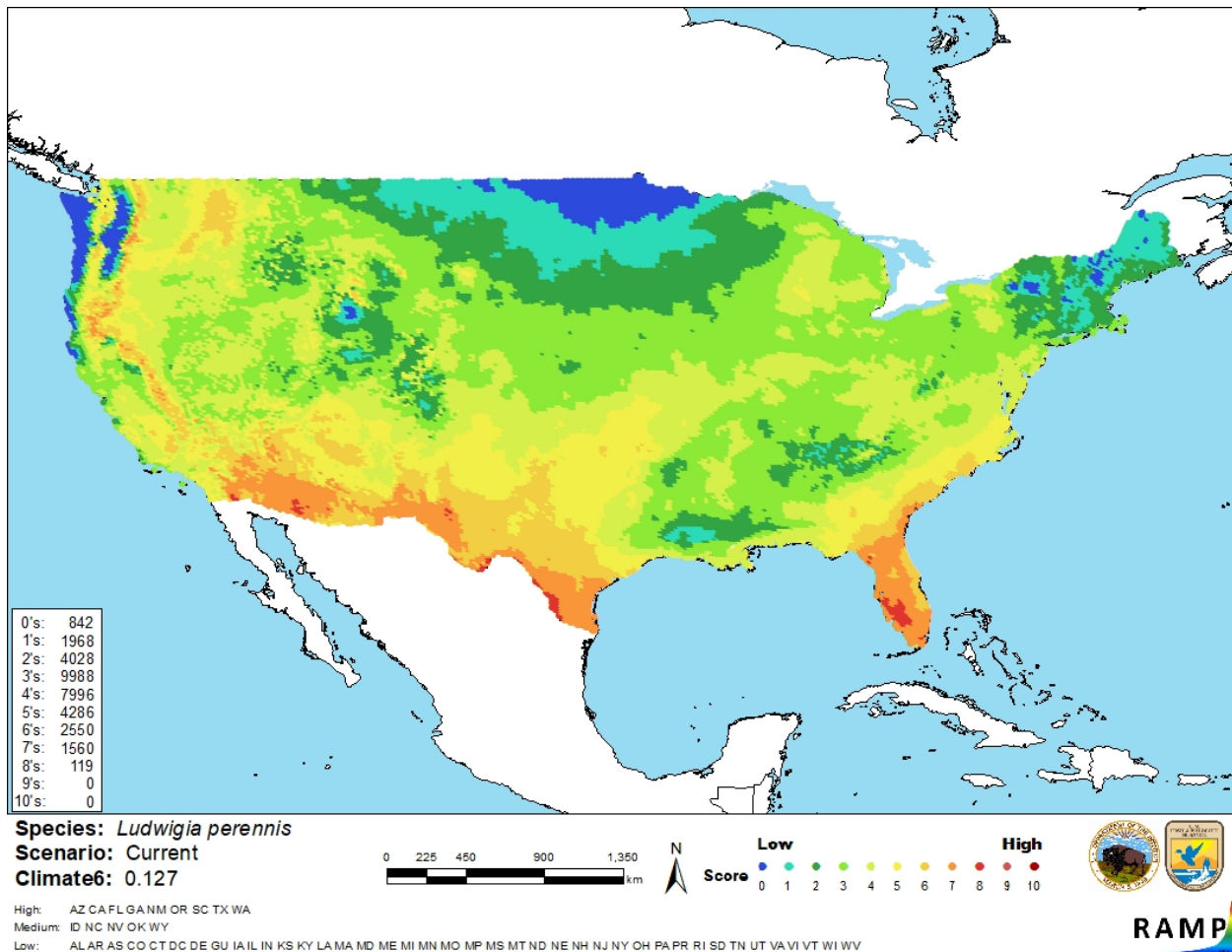


Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Ludwigia perennis* in the contiguous United States based on source locations reported by GBIF Secretariat (2021). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

8 Certainty of Assessment

Minimal information on the biology and ecology of this species was available. There was some disagreement found in descriptions of the species native range and introduced areas. The certainty of assessment is Low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Ludwigia perennis is an aquatic herb that grows in tropical and wet areas of Asia, Australia, Africa and the Middle East. *L. perennis* is used as medicine and its leaves as food in some of its native areas. It is unclear if the reported introductions in India, Sri Lanka, and Uzbekistan are within the native range of this species. The introduction to the Andaman Islands seems to be outside any description of the native range. The history of invasiveness category is Data Deficient for this species based on the reports of multiple introductions, with at least one resulting in an established population, but no evidence of negative impacts. The climate match for the contiguous United States is High, with high match generally being found along the United States and Mexico border, in the Southeast along the Gulf Coast, and in interior areas of the Pacific Coastal States. The certainty of assessment is Low due to a lack of information and uncertainty regarding the introduced populations. The overall risk assessment category for *Ludwigia perennis* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): Data Deficient**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks/Important additional information:** No additional information.
- **Overall Risk Assessment Category: Uncertain**

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.

[CABI] CAB International. 2019. *Ludwigia perennis* (Perennial Water Primrose). CABI Invasive Species Compendium. Wallingford, United Kingdom: CAB International. Available: <https://www.cabi.org/isc/datasheet/31672> (March 2021).

Diop FN, Rehel S. 2020. *Ludwigia perennis*. The IUCN Red List of Threatened Species 2020: e.T177025A67787729. Available: <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T177025A67787729.en> (March 2021).

GBIF Secretariat. 2021. GBIF backbone taxonomy: *Ludwigia perennis* L. Copenhagen: Global Biodiversity Information Facility. Available: <https://www.gbif.org/species/8129014> (March 2021).

Poelen JH, Simons JD, Mungall CJ. 2014. Global Biotic Interactions: an open infrastructure to share and analyze species-interaction datasets. *Ecological Informatics* 24:148–159.

Sudhakar Reddy C. 2008. Catalogue of invasive alien flora of India. *Life Science Journal* 5(2):84–98.

Sanders S, Castiglione C, Hoff M. 2018. Risk Assessment Mapping Program: RAMP. Version 3.1. U.S. Fish and Wildlife Service.

Selvamuthu B, Seetharaman S, Indra V, Daisy A. 2016. Antibacterial activity of methanolic extract of *Ludwigia perennis* leaves. World Journal of Pharmacy and Pharmaceutical Sciences 5:1186–1193.

Tropical Plants Database. 2021. *Ludwigia perennis*. Ken Fern. Available: tropical.theferns.info/viewtropical.php?id=Ludwigia+perennis (March 2021).

World Flora Online. 2021. *Ludwigia perennis* L. World Flora Online – a project of the World Flora Online Consortium. Available: <http://www.worldfloraonline.org/taxon/wfo-0000443282> (March 2021).

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.

Achigan-Dako E, et al. 2009. Traditional vegetables of Benin. [Source material did not provide full citation.]

Flora of China. 1994. Available: <http://flora.huh.harvard.edu/china/>. [Source material did not provide full citation.]