

## ***Blyxa leiosperma* (a plant, no common name)**

### **Ecological Risk Screening Summary**

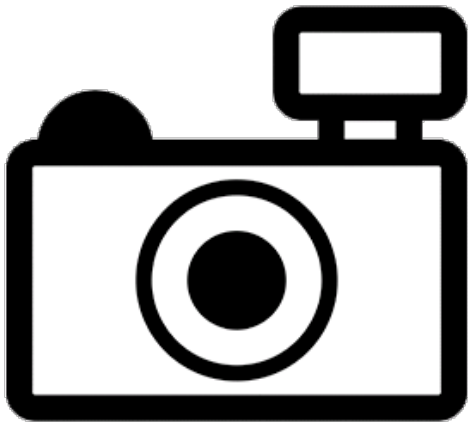
U.S. Fish & Wildlife Service, September 2020

Revised, December 2020

Web Version, 4/13/2021

Organism Type: Plant

Overall Risk Assessment Category: Uncertain



No Photo Available

## **1 Native Range and Status in the United States**

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### **Native Range**

From Shimizu and Satomi (1977):

“[Japan] Yamagata, Fukushima, Aichi, Kumamoto, and Kagoshima.”

From Wu et al. (2010):

“[Chinese provinces] Anhui, Fujian, Guangdong, Hainan, Jiangxi, Zhejiang.”

From Zhang and Yao (2018):

“Yangtze Delta, East China”

According to Shin et al. (2006), *Blyxa leiosperma* was collected in Korea and provided to a museum. However, they state the identity of the specimen collected was unclear. There were no other records of *B. leiosperma* in Korea found in the literature.

## **Status in the United States**

No records of *Blyxa leiosperma* in trade or in the wild in the United States were found.

## **Means of Introductions in the United States**

No records of *Blyxa leiosperma* in the wild in the United States were found.

## **Remarks**

There was very limited information about *Blyxa leiosperma* available in English text; many of the peer-reviewed papers were written in Chinese.

# **2 Biology and Ecology**

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## **Taxonomic Hierarchy and Taxonomic Standing**

According to World Flora Online (2021), *Blyxa leiosperma* Koidz. is the accepted name for this species.

From GBIF Secretariat (2020):

Kingdom Plantae  
Phylum Tracheophyta  
Class Liliopsida  
Order Alismatales  
Family Hydrocharitaceae  
Genus *Blyxa*  
Species *Blyxa leiosperma* Koidz

## **Size, Weight, and Age Range**

From Wu et al. (2010):

“[...] 2–6 cm tall, [...]”

## **Environment**

From Zhang and Yao (2018):

“Freshwater”

From Wu et al. (2010):

“Paddy fields”

## Climate

From Zhang and Yao (2018):

“YRD [Yangtze River Delta] has a monsoon subtropical climate, which is generally characterized by warm and humid weather. The region has a mean annual temperature of 14–17°C and the annual precipitation averages 1000–1500 mm. The frost-free period is 230–250 days. The coldest month is January, averaging 2.0–3.5°C with an extreme minimum of –12.2°C. The hottest month is July, averaging 27°C with an extreme maximum of 40.3°C (Shen & Luo 2007).”

## Distribution Outside the United States

### Native

From Shimizu and Satomi (1977):

“[Japan] Yamagata, Fukushima, Aichi, Kumamoto, and Kagoshima.”

From Wu et al. (2010):

“Anhui, Fujian, Guangdong, Hainan, Jiangxi, Zhejiang [Japan].”

From Zhang and Yao (2018):

“Yangtze Delta, East China”

According to Shin et al. (2006), *Blyxa leiosperma* was collected in Korea and provided to a museum. However, they state the identity of the specimen collected was unclear. There were no other records of *B. leiosperma* in Korea found in the literature.

### Introduced

There is no record or indication in the literature that this species has been introduced outside of its range.

## Means of Introduction Outside the United States

No records of introductions were found for *Blyxa leiosperma*.

## Short Description

From Wu et al. (2010):

“Stems elongated, 2–6 cm tall, branched from base. Leaves cauline, lanceolate, 6–9 cm × ca. 2.5 mm, veins 3, apex acuminate. Spathes green, 2.5–3 cm × ca. 2 mm, with peduncle 0.2–2.2 cm. Flowers bisexual. Sepals yellowish green, linear-lanceolate, 4–5 × ca. 0.5 mm. Petals 9–10 × ca. 1 mm. Stamens 3; filaments 3–5 mm; anthers 3.5–5 mm. Ovary conic; styles 5–6 mm. Fruit 2.5–3 cm. Seeds 40–60, ovoid, smooth.”

Zhang and Yao (2018) described *Blyxa leiosperma* as a submerged, perennial herb with a spinescent organ as a reproductive structure.

## **Biology**

From Wu et al. (2010):

“Fl[owers][...] and fr[uits][...] May–Sep”

The following section pertains to the genus *Blyxa*, not the species *Blyxa leiosperma*. There was no information in the literature on the biology of *Blyxa leiosperma*.

From Yakandawala (2012):

“Submerged plants: Plants that are generally rooted at the bottom, and the vegetative parts entirely submerged. At the time of flowering, the flowers and some leaves may emerge from the water. These plants could be [...] short stems bearing leaves in a basal rosette, and often producing stolons (e.g. *Blyxa*). These plants are restricted to depths where sufficient light reaches them through the water for photosynthesis.”

## **Human Uses**

This species is used as fodder for domestic animals in China (Jiangsu Institute of Botany (1977) in Zhang et al. (2014)). No ornamental, trade, or food uses were found for this species.

## **Diseases**

No records of diseases were found for this species.

## **Threat to Humans**

No threat to humans was indicated or recorded in the literature of this species.

# **3 Impacts of Introductions**

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No records of introductions were found for *Blyxa leiosperma*; therefore there is no information on impacts of introduction.

# **4 History of Invasiveness**

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There are no introductions or nonnative populations of *Blyxa leiosperma* reported in the literature; therefore there is no information on impacts of introduction. There are no State or Federal regulations for this species in the United States. The history of invasiveness is classified as No Known Nonnative Population.

## 5 Global Distribution

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**Figure 1.** Known global distribution of *Blyxa leiosperma*. Observations are reported from Japan. Map from GBIF Secretariat (2020).



**Figure 2.** Map of the Yangtze River Delta (Eastern China) where *Blyxa leiosperma* was collected by Zhang and Yao (2017). Map from SY/Wikimedia. Licensed under the Creative Commons BY-SA 4.0 International license. Available: [https://commons.wikimedia.org/wiki/File:Yangtze\\_River\\_Delta.png](https://commons.wikimedia.org/wiki/File:Yangtze_River_Delta.png) (September 2020).

Zhang and Yao (2018) reported *Blyxa leiosperma* from the Yangtze Delta, Eastern China. However, no coordinates were reported so the entire Delta was used to select source points.

Exact coordinates for reports provided by Shimizu and Satomi (1977) and Wu et al. (2010) were not available, and therefore all source points were used in those prefectures in Japan and provinces in China that are part of the species' native range.

## 6 Distribution Within the United States

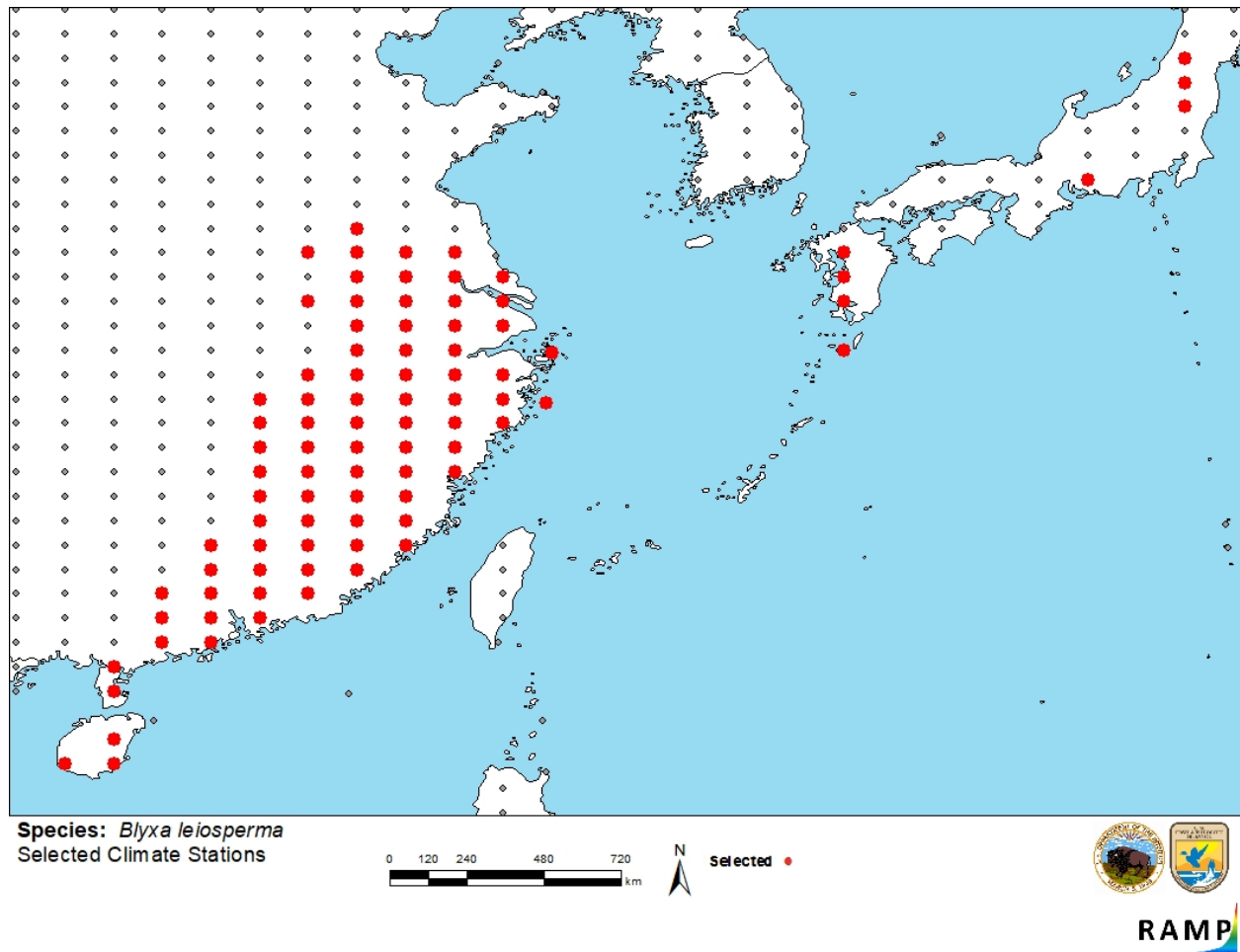
No records of *Blyxa leiosperma* in the wild in the United States were found.

## 7 Climate Matching

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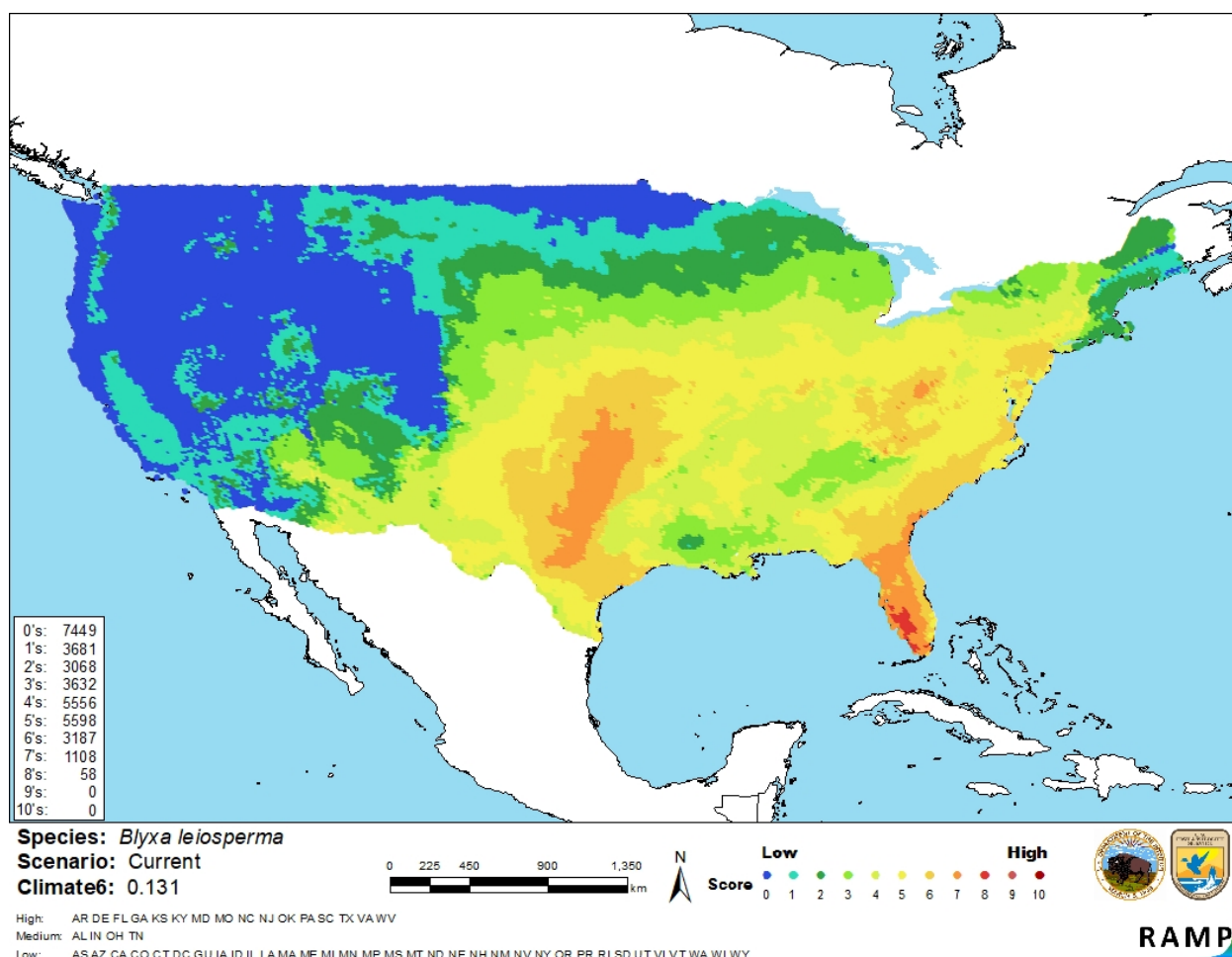
### Summary of Climate Matching Analysis

The climate match for *Blyxa leiosperma* was generally low in the West, upper Great Plains and upper Midwest. There were also smaller areas of low match in New England and northern New York, the southern Appalachian Mountains, and inland Louisiana. Areas of high match were found from central Texas north through Missouri and from Florida north along the Atlantic Coast to eastern Pennsylvania as well as in central Appalachia. Everywhere else had a medium match. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.131, high (scores 0.103 and greater are classified as high). More than half the States had low individual Climate 6 scores. Arkansas, Delaware, Florida, Georgia, Kansas, Kentucky, Maryland, Missouri, New Jersey, North Carolina, Oklahoma, Pennsylvania, South Carolina, Texas, Virginia, and West Virginia had high individual scores. Alabama, Indiana, Ohio, and Tennessee had medium individual scores.



**Figure 3.** RAMP (Sanders et al. 2018) source map showing weather stations in China and Japan selected as source locations (red) and non-source locations (gray) for *Blyxa leiosperma* climate matching. Source locations from Shimizu and Satomi (1977), Wu et al. (2010), Zhang and Yao (2018), and GBIF Secretariat (2020). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves. Selected source locations represent Chinese Provinces, Japanese Prefectures, and the Yangtze River delta where this species is reported as native and present.





**Figure 4.** Map of RAMP (Sanders et al. 2018) climate matches for *Blyxa leiosperma* in the contiguous United States based on source locations reported by Shimizu and Satomi (1977), Wu et al. (2010), Zhang and Yao (2018), and GBIF Secretariat (2020). 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
$\geq 0.103$	High

## 8 Certainty of Assessment

The certainty of assessment is low. There was minimal information regarding the biology, ecology, and distribution of *Blyxa leiosperma*. There were no records of introductions found, so impacts of introduction are unknown. Most of the area within the large native range lacked georeferenced coordinates so source points representing those general regions were used in the

climate match. Using the generalized range description for the climate match sources points over so large a range reduced the certainty in the interpretation of the climate match results. The bulk of the peer-reviewed literature on this species was not available in English.

## 9 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Blyxa leiosperma* is an aquatic plant native to Japan and the Yangtze River Delta of eastern China. Very limited biological, ecological, and distribution information was available for this species. There was no indication in the literature that species is regulated or in trade. It is used for animal fodder. There are no known introductions or nonnative populations reported in the literature; therefore the history of invasiveness is classified as No Known Nonnative Population. The overall climate match for the contiguous United States was High. Much of the contiguous United States had a low match (western and northern areas) or medium match. Areas of high match were found along the southern and mid-Atlantic Coast, central Appalachia, and central Texas north to Missouri. The certainty of assessment was Low due to the limited available information regarding this species and the lack of specific georeferenced information regarding distribution. The overall risk for this species is Uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): High**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: None**
- **Overall Risk Assessment Category: Uncertain**

## 10 Literature Cited

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

GBIF Secretariat. 2020. GBIF backbone taxonomy: *Blyxa leiosperma* Koidz. Copenhagen:

Global Biodiversity Information Facility. Available:

<https://www.gbif.org/species/2865988> (September 2020).

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

Shimizu T, Satomi N. 1977. A preliminary list of the rare and critical vascular plants of Japan. Kanazawa, Japan.

Shin H, Kadono Y, Choi H-K. 2006. Taxonomic notes on the Dr. Miki's specimens collected from Korea. Korean Journal of Plant Taxonomy 36:41–52.

- World Flora Online. 2021. World Flora Online – a project of the World Flora Online Consortium. Available: [www.worldfloraonline.org](http://www.worldfloraonline.org) (April 2021).
- Wu ZY, Raven PH, Hong DY. 2010. *Blyxa*. Pages 98–99 in Wu ZY, Raven PH, Hong DY, editors. Flora of China. Volume 23 (Acoraceae through Cyperaceae). Beijing: Science Press; St. Louis: Missouri Botanical Garden Press.
- Yakandawala D. 2012. Present status of fresh water aquatic flora in Sri Lanka. Pages 186–196 in Weerakoon DK, Wijesundara S, editors. The National Red List 2012 of Sri Lanka; Conservation Status of the Fauna and Flora. Colombo, Sri Lanka: Ministry of Environment.
- Zhang Y, Xu H, Chen H, Wang F, Huai H. 2014. Diversity of wetland plants used traditionally in China: a literature review. *Journal of Ethnobiology and Ethnomedicine* 10:72.
- Zhang G, Yao R. 2018. The spinescent aquatic plants in the Yangtze Delta, East China. *Israel Journal of Plant Sciences* 65:9–16.

## 11 Literature Cited in Quoted Material

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**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.**

- Jiangsu Institute of Botany. 1977. Flora of Jiangsu. Nanjing: Jiangsu People's Publishing.
- Kadono Y. 1994. Aquatic plants of Japan. Tokyo: Bun-ichi Sogo Shuppan.
- Shen ZX, Luo YM. 2007. The resources and environment of water-land and sustainability of the Yangtze River Delta. Beijing: Science Press.