

# Asian Marshweed (*Limnophila sessiliflora*)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, August 2015

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## 1 Native Range and Status in the United States

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### Native Range

GISD (2018) lists *Limnophila sessiliflora* as native in Bhutan, China, India, Indonesia, Japan, Democratic People's Republic of Korea, Republic of Korea, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Taiwan, and Viet Nam.

Rahman et al. (2010) lists *Limnophila sessiliflora* as present in Bangladesh.

## Status in the United States

From Swearingen and Barger (2016):

“*L. sessiliflora* is listed as a Federal Noxious Weed.”

According to USDA, NRCS (2018), *Limnophila sessiliflora* is listed as a Class A noxious weed in Alabama, North Carolina, and Vermont, a quarantine species in California and Oregon, a Class 2 prohibited aquatic plant in Florida, a prohibited species in Massachusetts, and an invasive aquatic plant and plant pest in South Carolina.

GISD (2018) lists *Limnophila sessiliflora* as alien, invasive, and established in Florida, Georgia, and Texas.

From Spencer and Bowes (1985):

“For example, *limnophila* is well established in localized areas of Florida such as Dead Lakes (Calhoun County); Lake Seminole in Southern Georgia; Lake Pierce and Lake Weohyakapa (Polk County); the Loxahatchee River (Martin County); and Lake Tsala Apopka (Citrus County). *Limnophila* and *hygrophila* are both found in dense stands in Boggy Creek near Orlando (Osceola County).”

## Means of Introductions in the United States

From Spencer and Bowes (1985):

“They are exotic plants to Florida, and appear to have been introduced by aquarium plant dealers ([Schoepfel 1969; Bruenner 1970; Hertel 1971; Zimpel 1972; Mahler 1980; Vandiver 1980; Les and Wunderlin 1981]).”

## Remarks

From Spencer and Bowes (1985):

“A hybrid between *L. indica* and *L. sessiliflora* also has been reported to be a new rice weed ([Piccoli 1974]). In this context it should be noted that *L. indica* is currently [as of 1985] being sold by the aquarium industry in Florida ([Mahler 1980]), and although it has not been reported growing as naturalized, the possibility for hybridization must not be overlooked.”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

“Kingdom Plantae  
Subkingdom Viridiplantae  
Infrakingdom Streptophyta

Superdivision Embryophyta  
Division Tracheophyta  
Subdivision Spermatophytina  
Class Magnoliopsida  
Superorder Asteranae  
Order Lamiales  
Family Plantaginaceae  
Genus *Limnophila*  
Species *Limnophila sessiliflora* (Vahl) Blume”

“Taxonomic Status:  
Current Standing: accepted”

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

From Swearingen and Barger (2016):

“[...] grows up to 12 ft (3.7 m) tall.”

### **Environment**

From GISD (2018):

“*L. sessiliflora* will grow in a variety of aquatic habitats and can withstand a minimum [water] temperature of 15°C, with an optimum [water] temperature between 20-26°C (IFAS, 2001).”

“In Florida, *L. sessiliflora* was found to grow best at pH 5-7.”

### **Climate/Range**

No information on specific climate requirements of *Limnophila sessiliflora* was found.

### **Distribution Outside the United States**

Native

GISD (2018) lists *Limnophila sessiliflora* as native in Bhutan, China, India, Indonesia, Japan, Democratic People’s Republic of Korea, Republic of Korea, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Taiwan, and Viet Nam.

Rahman et al. (2010) lists *Limnophila sessiliflora* as present in Bangladesh.

Introduced

From Lukás et al. (2014):

“In total, 48 alien aquatic vascular plants were recorded as established in Hungarian inland waters (Table I); 7 species (*Bacopa caroliniana*, *Houttuynia cordata*, *Hygrophila corymbosa*, *H. difformis*, *Limnophila sessiliflora*, *Rotala rotundifolia*, and *Vallisneria gigantea*) are new to the DAISIE list (DAISIE 2009).”

Pagad et al. (2018) lists *Limnophila sessiliflora* as alien in Bhutan, Seychelles, and Slovakia, and cryptogenic in Singapore.

## Means of Introduction Outside the United States

No information on means of introduction to areas outside of the United States was found.

## Short Description

From Swearingen and Barger (2016):

“Leaves of this plant have two types of whorled polymorphic leaves. The submerged stems have dissected, dark green, lance shaped leaves up to 1.2 in. (30 mm) long with irregularly serrated margins. The emergent stems have flat shiny hairs and fine, needle like leaves up to 0.12 in. (3 cm) long.”

“The small flowers are sessile and arise singly from the leaf axis. The violet, lavender, pink, or blue flowers have five fused petals that form a tube. The floral tube has two lips, which have distinct purple lines on the undersides. The five sepals are green and hairy. Sepals are from 0.16-0.2 in. (4-5 mm) long.”

“The fruit is an ellipsoid capsule that can contain up to 150 seeds.”

## Biology

From Swearingen and Barger (2016):

“*Limnophila sessiliflora* is a rooted, aquatic, perennial, herbaceous plant [...]. It is fast growing, grows new plants from fragments, and can exist in a variety of aquatic habitats.”

From GISD (2018):

“Hall and Vandiver (2003) state that, “In late fall *L. sessiliflora* mats break loose from the hydrosol. Since the fruit is mature in the late fall the floating mats spread the seeds as they move.”

From Spencer and Bowes (1985):

“[...] but there is doubt as to whether herbivorous fish will eat limnophila, because of a toxin supposedly present in the stem tissue ([Mahler 1980]).”

## Human Uses

No information on human uses of *Limnophila sessiliflora* was found.

## Diseases

No information on parasites or pathogens of *Limnophila sessiliflora* was found.

## Threat to Humans

No information on threats to humans from *Limnophila sessiliflora* was found.

## 3 Impacts of Introductions

From Spencer and Bowes (1985):

“*Limnophila* species (including *L. sessiliflora*) are documented major weed problems in paddy rice fields of India, China, Japan, and the Philippines ([Harada et al. 1975; Misra and Tripathy 1975; Pancho 1976; Takematsu et al. 1976]). A hybrid between *L. indica* and *L. sessiliflora* also has been reported to be a new rice weed ([Piccoli 1974]).”

From GISD (2018):

“IFAS (2001) reports that, "*L. sessiliflora* is fast-growing and able to regrow from fragments. It is also able to shade out, and thus, out-compete totally submersed species. This species also clogs irrigation and flood-control canals, and pumping and power stations. *L. sessiliflora* is a major weed problem in paddy rice fields of India, China, Japan and the Philippines." The authors also state that, "*L. sessiliflora* is an efficient photosynthesizer and has a low light compensation point for long periods of photosynthesis, making it a competitive plant because it can start growing in low light before other plants do.””

## 4 Global Distribution



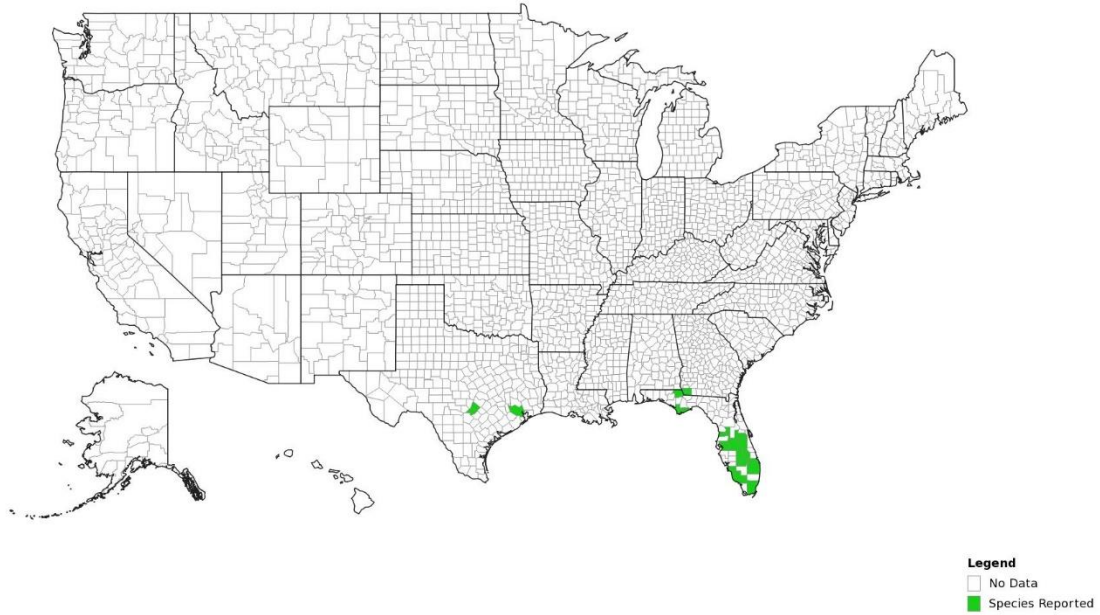
**Figure 1.** Known global distribution of *Limnophila sessiliflora*. Locations are in North America, South America, Asia, Africa, and Australia. Map from GBIF Secretariat (2018).

The locations in Bolivia, Cameroon, Australia, and Papua New Guinea were used as source points for the climate match. The records indicated that the specimens were collected from the wild (GBIF Secretariat 2018).

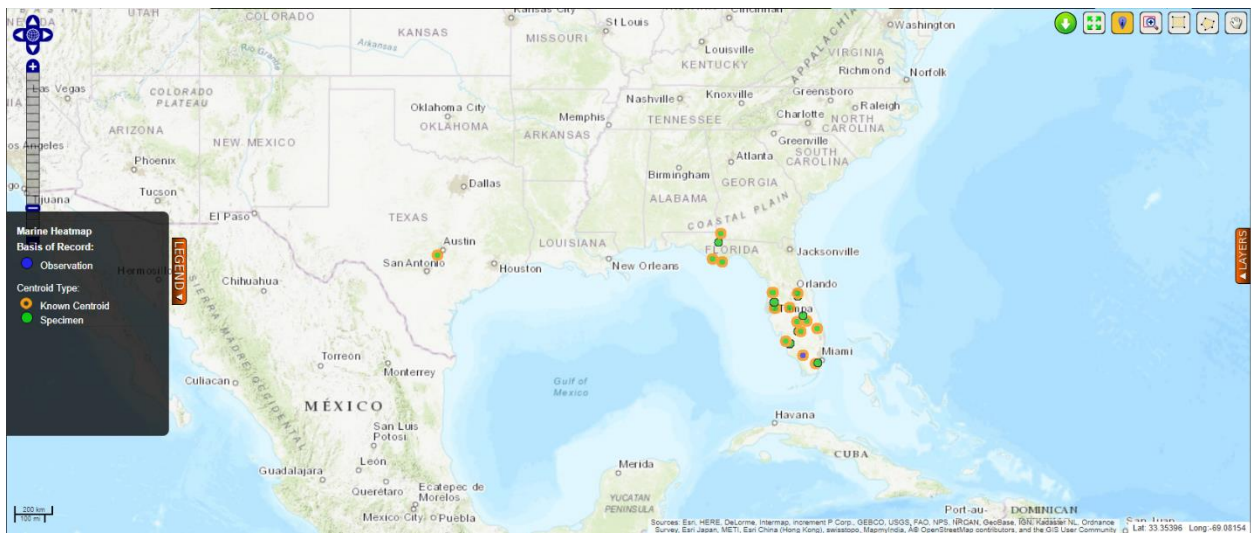
# 5 Distribution Within the United States

*limnophila (Limnophila sessiliflora)*

EDDMapS



**Figure 2.** Known distribution of *Limnophila sessiliflora* in the United States. Map from EDDMapS (2018).

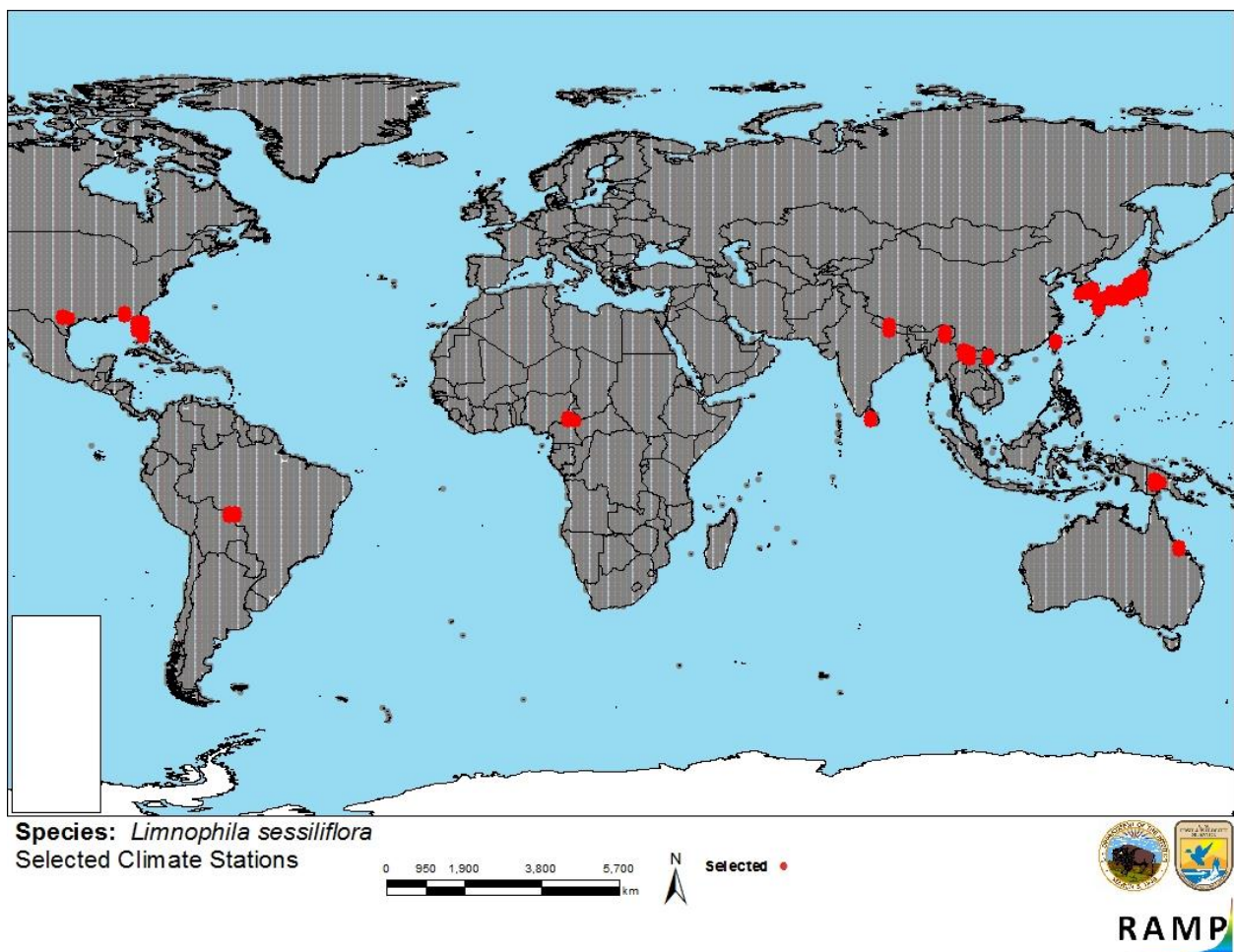


**Figure 3.** Known distribution of *Limnophila sessiliflora* in the United States. Map from BISON (2018).

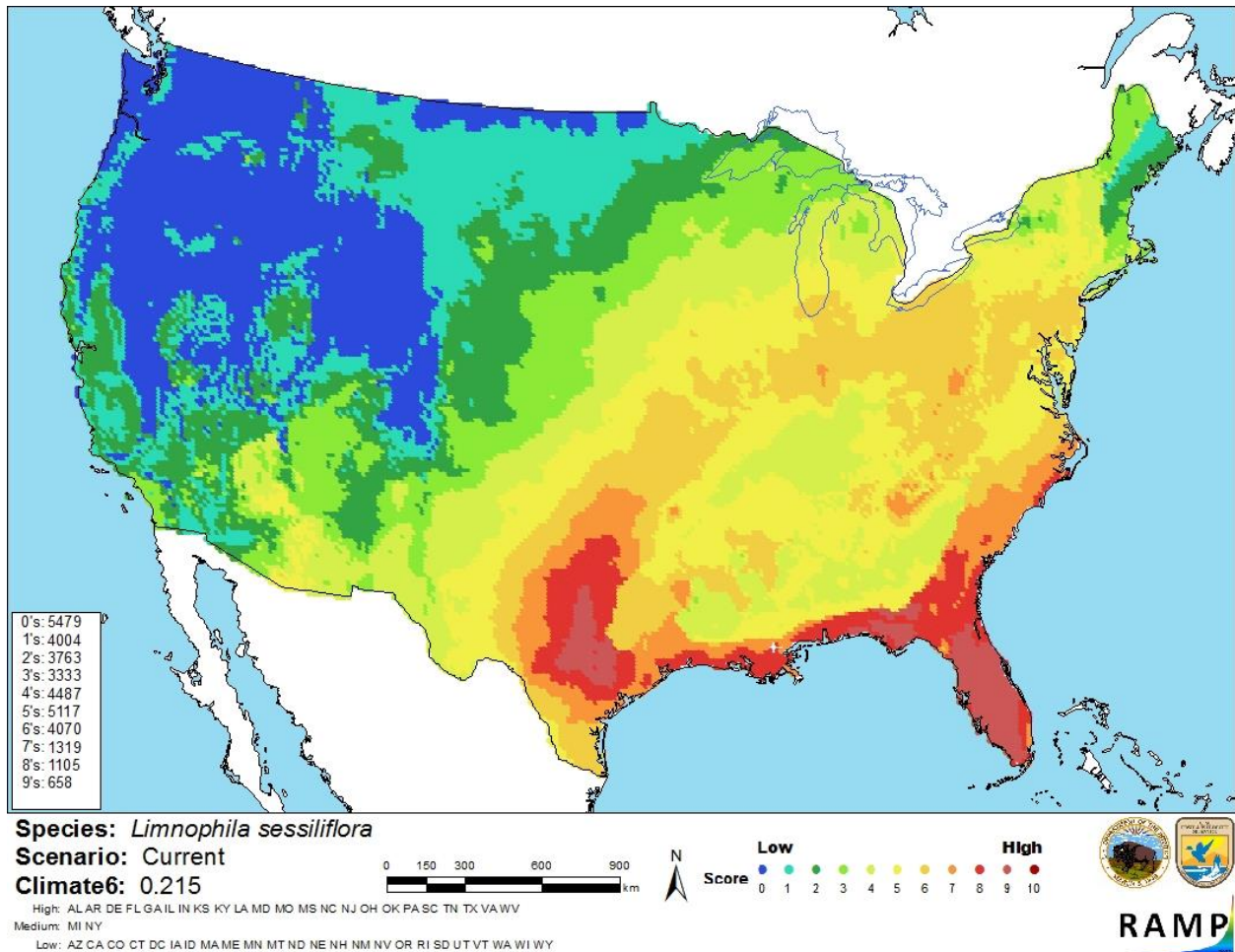
## 6 Climate Matching

### Summary of Climate Matching Analysis

The climate match for *Limnophila sessiliflora* was high along the southern Atlantic and Gulf coasts, most of Florida, and central Texas. Most of the eastern contiguous United States had a medium match except for New England which was mostly low. The western contiguous United States had a low match with small areas of medium match in the southwest. The Climate 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous United States was 0.215, high. The following states had individually high climate scores: Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Indiana, Kansas, Louisiana, Maryland, Mississippi, Missouri, New Jersey, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, and West Virginia.



**Figure 4.** RAMP (Sanders et al. 2014) source map showing weather stations in North and South America, Africa, Asia, and Australia selected as source locations (red) and non-source locations (gray) for *Limnophila sessiliflora* climate matching. Source locations from BISON (2018), EDDMapS (2018), and GBIF Secretariat (2018).



**Figure 5.** Map of RAMP (Sanders et al. 2014) climate matches for *Limnophila sessiliflora* in the contiguous United States based on source locations reported by BISON (2018), EDDMapS (2018), and GBIF Secretariat (2018). 0 = Lowest match, 10 = Highest match. Counts of climate match scores are tabulated on the left.

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

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
$\geq 0.103$	High

## 7 Certainty of Assessment

Certainty of this assessment is low. Information on the biology, invasion history and impacts of this species is minimal, with little peer-reviewed literature. The species is reported as invasive and native in the same range depending on the source consulted. The distribution used as source points for the climate match may not be complete.



## 8 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Limnophila sessiliflora* is an aquatic plant native to Southeast Asia. The history of invasiveness is not documented. *L. sessiliflora* has been successfully introduced into parts of the southern United States and potentially elsewhere. The species was introduced as an ornamental. There are reports that the species may be a crop pest or interfere with navigation and water control but they were not backed by scientific investigation. Climate matching indicated the contiguous United States has a high climate match with already established *L. sessiliflora* populations in the southeastern United States. This amphibious plant is a federally and state listed noxious species. Certainty of this assessment is low. The overall risk assessment category is uncertain.

### Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): High**
- **Certainty of Assessment (Sec. 7): Low**
- **Remarks/Important additional information:** *L. sessiliflora* is listed as a Federal Noxious Weed.
- **Overall Risk Assessment Category: Uncertain**

## 9 References

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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 10.**

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## 10 References Quoted But Not Accessed

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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.**

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