U.S. Fish & Wildlife Service

Ottelia acuminata (a plant, no common name)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2020
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Organism Type: Plant
Overall Risk Assessment Category: Uncertain

Photo: Panayoti Kelaidis. Licensed under CC BY-NC 4.0. Available: https://www.gbif.org/occurrence/2579403361. (August 2020).

1 Native Range and Status in the United States

Native Range

From Roskov et al. (2020):

"China South-Central; China Southeast; Hainan"

From Guo et al. (2019):

"*Ottelia acuminata* is endemic to China. Its known occurrences are in the southwestern and southern provinces Yunnan, Sichuan, Guizhou, and Guangxi (Li 1981)."

Status in the United States

No records of *Ottelia acuminata* in trade or in the wild in the United States were found.

Means of Introductions in the United States

No records of *Ottelia acuminata* in the wild in the United States were found.

Remarks

From Guo et al. (2019):

"*Although O. acuminata*, like many other threatened aquatic plants, is listed among the key state protected wild plants (State Environmental Protection Bureau of China 1987) and has been categorized as vulnerable with a status "A2c" in the China Species Red List (Wang and Xie 2004; Qin et al. 2017), many populations have perished and the species range has been dramatically reduced during the past 30 years due to multiple factors, such as water eutrophication, wetland destruction, introduction of herbivorous fish and overharvesting (Li 1985, 1988; Li and Shang 1989; Godo et al. 2003; Liang and Li 2007; Jiang et al. 2010; Yang et al. 2012)."

According to World Flora Online (2020), *Boottia acuminata* Gagnep, *B. echinata* W.W.Sm., *B. esquirolii* H.Lév. & Vaniot, *B. polygonifolia* Gagnep, *B. yunnanensis* Gagnep., *Oligolobos triflorus* Gagnep., *Ottelia acuminata* var. *acuminata*, *O. acuminata* var. *tonhaiensis* H.Li, *O. acuminata* var. *crispa* (Hand.-Mazz.) H.Li, *O. cavaleriei* Dandy, *O. esquirolii* (H.Lév. & Vaniot) Dandy, *O. polygonifolia* (Gagnep.) Dandy, *O. yunnanensis* (Gagnep.) Dandy, *Xystrolobos yunnanensis* Gagnep., and *X. yunnanensis* var. *calospatha* H.Lév. are synonyms or accepted varieties for *O. acuminata*. Searches were conducted using the current and previous scientific names.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

According to World Flora Online (2020), *Ottelia acuminata* (Gagnep.) Dandy is the current accepted name for this species.

From Roskov et al. (2020):

Kingdom Plantae
  Phylum Tracheophyta
    Class Liliopsida
      Order Alismatales
        Family Hydrocharitaceae
          Genus *Ottelia*
            Species *Ottelia acuminata* (Gagnep.) Dandy

Size, Weight, and Age Range

From Guo et al. (2019):

"*Ottelia acuminata* (Hydrocharitaceae) is a submerged aquatic perennial."

From Wang et al. (2010):

"[…] petals white with yellow base, obcordate or obovate, 1-3.5 cm; […] Fruit triangular-cylindric to fusiform, ca. 8 cm."

From Zhao et al. (2018):

"The growth indicators of *O. acuminata* showed positive responses to water depth. All plant height, total root length, leaf number, and fresh weight varied with changes in water depth. The plant height was significantly higher at 0.5 and 1.0 m than at 1.5 m ($P < 0.05$), but no significant difference was found between the former two groups ($P > 0.05$) […]. The mean plant height at 1.0 m reached 68.7 cm, which was the highest group; the lowest plant height appeared at 1.5 m, only 57.2 cm."

Environment

From Zhao et al. (2018):

"*Ottelia acuminata* is an endemic, perennial, submerged plant in the family Hydrocharitaceae and is mainly distributed in freshwater habitats below 2700 m in Yunnan, Guizhou, Hainan, and Guangxi (Wang 2011). *Ottelia acuminata* has a high requirement for a water environment and a high dependence on water transparency and light; thus, it can serve as an indicator species for the quality of the water environment."

"*Ottelia acuminata* can constantly adjust its morphological and physiological conditions with changes in water depth to adapt to complex environments. In the current water environmental conditions, 1.0 m is the optimum water depth for the restoration of *O. acuminata* to Yilong Lake."

From Zhai et al. (2018):

"*Ottelia acuminata* is highly sensitive to water pollution for it is confined to freshwater habitat, rather than acidic or basic waters, and mainly grows in lakes, rivers and streams with a pH range of 7–8.4 (Li 1987)."

Climate

From Zhao et al. (2018):

"*Ottelia acuminata* is an endemic, perennial, submerged plant in the family Hydrocharitaceae and is mainly distributed in freshwater habitats below 2700 m in Yunnan, Guizhou, Hainan, and Guangxi (Wang 2011)."

From Wang et al. (2017):

"The area [Guangxi Zhuang Autonomous Region, China] has a subtropical monsoon climate, hot and rainy; the annual mean temperature is about 18–19 °C, and it receives an annual rainfall of about 1650 mm."

Distribution Outside the United States

Native

From Roskov et al. (2020):

"China South-Central; China Southeast; Hainan"

From Guo et al. (2019):

"*Ottelia acuminata* is endemic to China. Its known occurrences are in the southwestern and southern provinces Yunnan, Sichuan, Guizhou, and Guangxi (Li 1981)."

Introduced

No records of introductions were found for *Ottelia acuminata*.

Means of Introduction Outside the United States

No records of introductions were found for *Ottelia acuminata*.

Short Description

From World Flora Online (2020):

"Leaves wholly submerged; petioles varying greatly in length according to depth of water; leaf blades varying greatly in shape and size, linear to broadly cordate, base cordate to attenuate, margin entire, undulate, or serrulate, apex obtuse. Flowers unisexual. Spathe with 2-6 longitudinal ribs. Male spathe with 40-190 male flowers; sepals green; petals white with yellow base, obcordate or obovate, 1-3.5 cm; stamens 9-12; filaments hairy; anthers ovoid-elliptic; staminodes 3. Female spathe with 2-9 female flowers; perianth similar to male ones; ovary triangular-cylindric with 3 carpels; styles 3, deeply bifid; staminodes 3. Fruit triangular-cylindric to fusiform, ca. 8 cm. Seeds narrowly elliptic, with or without hairs. Fl. [flowers] May-Oct."

Biology

From World Flora Online (2020):

"Flowers unisexual"

From Guo et al. (2019):

"*Ottelia acuminata* (Hydrocharitaceae) is a submerged aquatic perennial. The species is dioecious, insect-pollinated and shows sexual dimorphism in flower display. While a staminate

inflorescence has 40–50 staminate flowers, carpellate spathes have only two to nine carpellate flowers. Staminate and carpellate flowers, both lasting only a single day, are pollinated by generalist pollinators (Wang et al. 2010)."

Human Uses

From Zhai et al. (2017):

"Moreover, *O. acuminata* is used by local people as an ornamental, medicinal, and edible plant (Li 1981; Jiang et al. 2010). For example, the leaves, peduncles and spathes are gathered and sold in local markets for human consumption."

Diseases

No records of disease were found for *Ottelia acuminata.*

Threat to Humans

No threats to humans were found for *Ottelia acuminata*.

3 Impacts of Introductions

No records of introductions were found for *Ottelia acuminata*; therefore, there is no information on impacts of introduction.

4 History of Invasiveness

No records of introductions outside its native range were found for *Ottelia acuminata.* According to Guo et al. (2019), *O. acuminata* has been re-introduced to waterbodies within its native range where it was previously extirpated. The history of invasiveness is classified as No Known Nonnative Population.

5 Global Distribution

Figure 1. Known global distribution of *Ottelia acuminata*. Observations are primarily reported from southern China. Map from GBIF Secretariat (2020). The observation from central China was not used as a source point in the climate match analysis as this record was found to have inaccurate geographic information (CJBG 2020).

6 Distribution Within the United States

No records of *Ottelia acuminata* in the wild in the United States were found.

7 Climate Matching

Summary of Climate Matching Analysis

The climate match was low for nearly all of the contiguous United States. There were small isolated areas that had a medium match including peninsular Florida, portions of the Southwest along the United States border with Mexico, and in the central portion of the Great Plains. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.001, low (scores between 0.000 and 0.005, inclusive, are classified as low). Only Florida had a medium individual Climate 6 score, all other States had low individual scores.

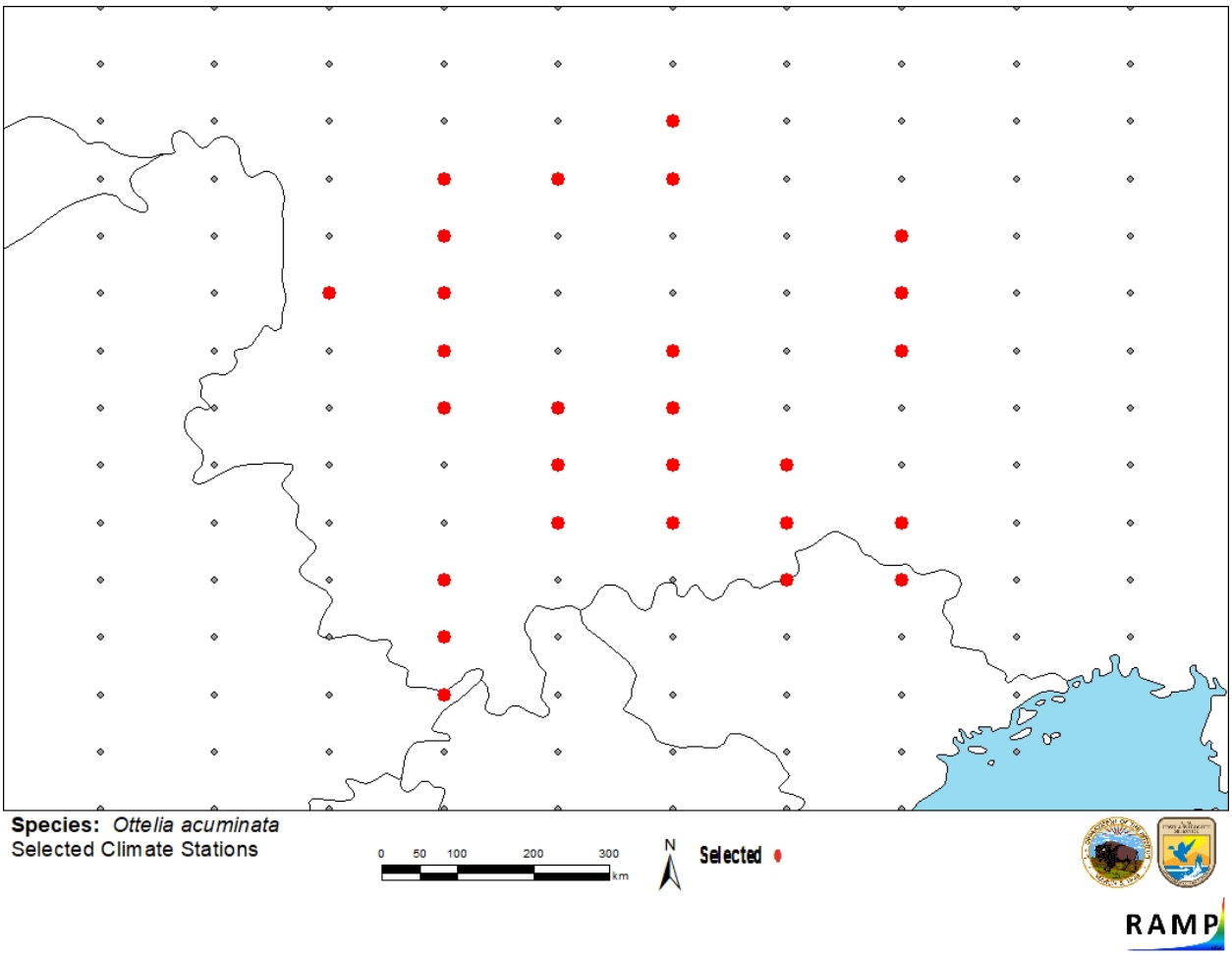

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in southeastern Asia selected as source locations (red; southern China, Vietnam, and Myanmar) and non-source locations (gray) for *Ottelia acuminata* climate matching. Source locations from GBIF Secretariat (2020). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

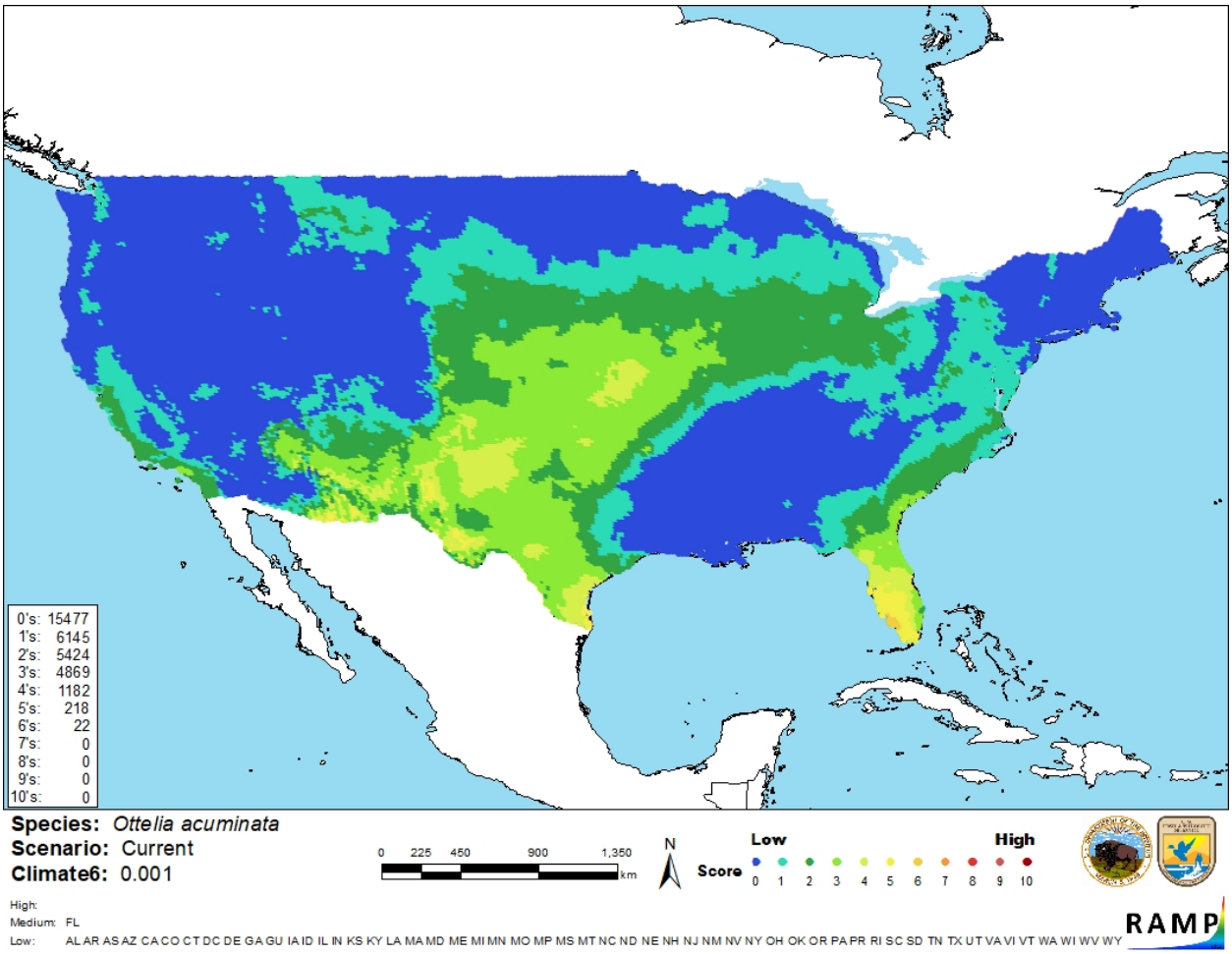

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Ottelia acuminata* in the contiguous United States based on source locations reported by GBIF Secretariat (2020). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

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≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

The certainty of assessment for *Ottelia acuminata* is low. Biological and ecological information for this species was available, but limited. Although *O. acuminata* is in trade locally, it has not been reported as introduced outside of its native range, therefore this is no information about invasiveness.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Ottelia acuminata is a perennial freshwater aquatic plant species of conservation concern that is endemic to China. This species is harvested locally as an ornamental, medicinal, and edible plant. The history of invasiveness is classified as No Known Nonnative Population as no records of introduction outside of its native range were found. The overall climate match for the contiguous United States was low. There were areas of medium match in peninsular Florida, portions of the Southwest along the Untied States border with Mexico, and in the central portion of the Great Plains. The certainty of assessment is low due to a lack of information. The overall risk assessment category for *O. acuminata* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Low**
- **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.

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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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