

# *Damasonium alisma* (a plant, no common name)

## Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, February 2021  
Revised, March 2021  
Web Version, 7/28/2021

Organism Type: Plant  
Overall Risk Assessment Category: Uncertain



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# 1 Native Range and Status in the United States

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## Native Range

From Lansdown (2015):

“*Damasonium alisma* has a highly disjunct distribution, with one population in the area around the Black Sea and the northern end of the Caucasus, the other in western Europe. It has been reliably recorded from the United Kingdom, France, Kazakhstan, Russia and Ukraine (Rich and Nicholls-Vuille 2001, Fedorov 2001, Klinkova 2012, Lansdown 2014), with most records from France. Reports from Italy and Portugal are unconfirmed and may be the result of misidentifications. There are also unconfirmed reports from Turkey (A. Byfield pers. comm.) which may represent the southern limits of the eastern population.”

From Rich and Nicholls-Vuille (2001):

“Distribution. England, France, Italy, Portugal, Russia and Ukraine [...]. The records indicate that *D. alisma* is the most northerly species, predominantly occurring inland in England and France, with scattered records from the western Mediterranean coast, Russia and Ukraine.

## Status in the United States

No records of *Damasonium alisma* in trade or in the wild in the United States were found.

## Means of Introductions in the United States

No records of *Damasonium alisma* in the wild in the United States were found.

## Remarks

*Damasonium alisma* is known by the common name Starfruit (Lansdown 2015); however multiple other species that share the genus *Damasonium* also have the common name of Starfruit.

From Lansdown (2015):

“This species is classed as Vulnerable as it has a restricted range with an area of occupancy (AOO) estimated to be between 580 km<sup>2</sup> to 1,800 km<sup>2</sup> combined with severely fragmented populations and a continuing decline throughout its range, with both local and regional extinctions. *D. alisma* is declining over its entire range due to a combination of direct loss of habitat, decline in grazing leading to succession and increased competition, changes in land-use and stabilisation of water levels. These factors lead to a disruption of the metapopulation function and cause the populations to become fragmented. There is no evidence that the factors causing this decline are decreasing and there is evidence that the decline is now affecting core populations.

It is suspected that the species might even qualify for the Endangered category as 50% of its population and range has been lost. However, with the data available it could not be determined

whether these disappearances happened in the past ten years, therefore criterion A could not be applied for this assessment.”

“*Damasonium alisma* is declining throughout its range and recent clarification of its identification (Rich and Nicholls-Vuille 2001) has helped to show the scale of the decline. It suffered a catastrophic decline in the United Kingdom in the 19th and early 20th centuries (Preston et al. 2002), from 51 x 10 km<sup>2</sup>, to a single site and now no longer grows every year (Lansdown 2014a, b). In France, it has similarly been lost from a total of 13 of the 31 departments from which it has been recorded (Danton and Baffray 1995) and remains frequent only in the Marais Poitevin and the Parc Naturel Regional de la Briere (Lansdown 2014c). It has been recorded from a total of 18 localities in the Parc Naturel Regional de la Brenne (Pinet 2005) but is now considered to be declining (F. Pinet pers. comm). In Portugal the only records derive from identification of herbarium specimens (Rich and Nicholls-Vuille 2001) which pre-date 2001. It must therefore be considered to be at least technically extinct in Portugal. In Italy it has not been widely recognised by botanists and so it is difficult to distinguish its range from that of *D. bourgaei*; it is apparently extinct in Campania and only reliably recorded from Lazio, Puglia and Toscana (Conti et al. 2005, D. Saiani pers. comm. 2012). It has been recorded from a total of four sites in the Ukraine, but has disappeared from two of these (Diduch 2009). It is declining in its Russian range (Laktionov 2010). It is considered to be one of the rarest plants of the limans (seasonal lakes) in Kazakhstan, occurring in only two or three sites (Klinkova 2012).”

“In France, *D. alisma* is protected at the national level (Annex 1), and it is classed as Critically Endangered in the United Kingdom (Cheffings and Farrell 2005). In the UK, *D. alisma* has been the subject of intensive site management, restoration and conservation ultimately with only short-term success.”

From Wheeler (2005):

“[...] [*Damasonium alisma*] is generally regarded as rare and vulnerable throughout much of France and is protected under the "Arrêté du 31 août 1995" (and amendments) (Danton & Baffray, 1995). Whilst *Damasonium alisma* is included on the Liste Nationale, Annex 1, Appendix 1 (Conservatoire Botanique du Bassin Parisien, 1998) it is not protected under international legislation. Its official status in Europe is Not Threatened - Probably Endemic (Wigginton, 1999).”

“*Damsonium alisma* has been listed under Schedule 8 of Part I of the Wildlife and Countryside Act, 1981 [in the United Kingdom] since 1981.”

## 2 Biology and Ecology

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### Taxonomic Hierarchy and Taxonomic Standing

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

From ITIS (2021):

Kingdom Plantae  
Subkingdom Viridiplantae  
Infrakingdom Streptophyta  
Superdivision Embryophyta  
Division Tracheophyta  
Subdivision Spermatophytina  
Class Magnoliopsida  
Superorder Lilianae  
Order Alismatales  
Family Alismataceae  
Genus *Damasonium*  
Species *Damasonium alisma* Mill.

## Size, Weight, and Age Range

From Rich and Nicholls-Vuille (2001):

“[...] *D. alisma* and *D. bourgaei* are more variable in size [than *Damasonium polyspermum*] and both may grow from c.5cm to 30–50cm or more.”

“Plant 5–50cm tall. Inflorescence 1–4(–6)-whorled, lax, with pedicels usually 2–4(–12)cm. Petals  $4.2 \pm 0.5$ mm long  $\times$   $3.7 \pm 0.5$ mm wide, white with a yellow spot at base. Anthers c.0.7–0.9mm (mean  $0.75 \pm 0.06$ mm). Carpels usually 6 in a whorl, each (1–)2-seeded, 7–11(–15)mm long  $\times$  2.5–4mm wide, triangular to broadly triangular with a distinct to indistinct beak, glaucous when fresh. *Seeds* 1.7–2.5mm long  $\times$  0.8–1.2mm wide, oblong to reniform.”

## Environment

From Wheeler (2005):

“*Damasonium alisma* Miller, a rare annual (occasionally perennial) member of the Alismataceae, is confined to freshwater aquatic habitats. These aquatic habitats are generally small to large ponds in heathland or rough pasture within lowland habitats. Ponds in which *Damasonium alisma* occurs have seasonal fluctuations in the water level that expose shallow muddy margins of largely clayey mineral soil with gravels. [...] In shallow ponds, plants are found across the water body but in deeper ponds the plant is generally restricted to the margins.”

From Lansdown (2015):

“In the UK it appears to have occurred mainly on sites where the substrate was mainly acid, but waters were more basic, although in other areas it is considered to be typically a species of lowland naturally mesotrophic or eutrophic sites.”

## Climate

No information on climate was available.

## Distribution Outside the United States

### Native

From Lansdown (2015):

“*Damasonium alisma* has a highly disjunct distribution, with one population in the area around the Black Sea and the northern end of the Caucasus, the other in western Europe. It has been reliably recorded from the United Kingdom, France, Kazakhstan, Russia and Ukraine (Rich and Nicholls-Vuille 2001, Fedorov 2001, Klinkova 2012, Lansdown 2014), with most records from France. Reports from Italy and Portugal are unconfirmed and may be the result of misidentifications. There are also unconfirmed reports from Turkey (A. Byfield pers. comm.) which may represent the southern limits of the eastern population.”

From Rich and Nicholls-Vuille (2001):

“Distribution. England, France, Italy, Portugal, Russia and Ukraine [...]. The records indicate that *D. alisma* is the most northerly species, predominantly occurring inland in England and France, with scattered records from the western Mediterranean coast, Russia and Ukraine.

### Introduced

No records of introductions were found for *Damasonium alisma* outside of its native range.

## Means of Introduction Outside the United States

No records of introductions were found for *Damasonium alisma* outside of its native range.

## Short Description

From Wheeler (2005):

“*Damasonium alisma* Miller (Alismataceae, Monocotyledon) is an annual, or occasionally perennial, aquatic herb [...]. Leaves are all basal, long petiolate, submerged, floating or emergent, ovate-oblong with cordate base. Stems erect, to 30(60)cm; leaves 3-6(8)cm, flowers in whorls, bisexual, petals 3, white, with basal yellow blotch; 5-9mm across; stamens 6; carpels 6 in 1 whorl, with terminal style, each with 2 ovules; follicles 5-14mm with long beak (2n=42), (Stace, 1997).”

“There are three additional British genera in the family Alismataceae - *Baldellia*, *Alisma* and *Sagittaria*. *Damasonium alisma* can be distinguished from these by the following characters: the leaves [sic] are rounded at the apex, they are not as acute as in the other three genera, and the carpels are few (6) and beaked. Whilst difficult to identify at the vegetative stage, the fruit is easily distinguished from all other species by the ‘star’ shaped infructescence composed of six follicles [...].”

From Rich and Nicholls-Vuille (2001):

“[...] *D. alisma* and *D. bourgaei* are more variable in size [than *Damasonium polyspermum*] and both may grow from c.5cm to 30–50cm or more.”

“Plant 5–50cm tall. Inflorescence 1–4(–6)-whorled, lax, with pedicels usually 2–4(–12)cm. Petals  $4.2\pm 0.5$ mm long $\times 3.7\pm 0.5$ mm wide, white with a yellow spot at base. Anthers c.0.7–0.9mm (mean  $0.75\pm 0.06$ mm). Carpels usually 6 in a whorl, each (1–)2-seeded, 7–11(–15)mm long $\times 2.5$ –4mm wide, triangular to broadly triangular with a distinct to indistinct beak, glaucous when fresh. *Seeds* 1.7–2.5mm long $\times 0.8$ –1.2mm wide, oblong to reniform.”

## Biology

From Rich and Nicholls-Vuille (2001):

“It is likely that the seeds are dispersed inadvertently by wildfowl, and locally by water and possibly by animals moving around wetland sites.”

From Wheeler (2005):

“*Damasonium alisma* Miller (Alismataceae, Monocotyledon) is an annual, or occasionally perennial, aquatic herb [...].”

“The plant germinates and grows initially as a submerged ‘aquatic’ within the water body and later develops into either a floating or emergent aquatic plant or a ‘terrestrial’ plant on the muddy margins exposed by the draw down in the water level. Plants can flower and fruit either in aquatic or terrestrial form.”

“Germination of *Damasonium alisma* seed takes place in autumn or spring whilst water levels are still high.”

## Human Uses

No information on human uses were found for *Damasonium alisma*.

## Diseases

No information on diseases was found for *Damasonium alisma*.

## Threat to Humans

No threats to humans were found for *Damasonium alisma*.

## 3 Impacts of Introductions

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

## 4 History of Invasiveness

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No reports of introductions of *Damasonium alisma* outside its native range were found. No records of *Damasonium alisma* having been traded could be found either. Therefore, the history of invasiveness is classified as No Known Nonnative Population.

## 5 Global Distribution

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**Figure 1.** Known global distribution of *Damasonium alisma*. Observations are reported from the United Kingdom, France, Italy, Spain, Ukraine, and Israel. Map from GBIF Secretariat (2021). The locations in Spain and Israel were not used to select source points for climate match as they do not represent wild, established populations.

Additional georeferenced observations in Portugal and Russia were reported in Rich and Nicholls-Vuille (2001).

No georeferenced observations were found for Kazakhstan.

## 6 Distribution Within the United States

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*Damasonium alisma* has not been reported as introduced or established in the United States.

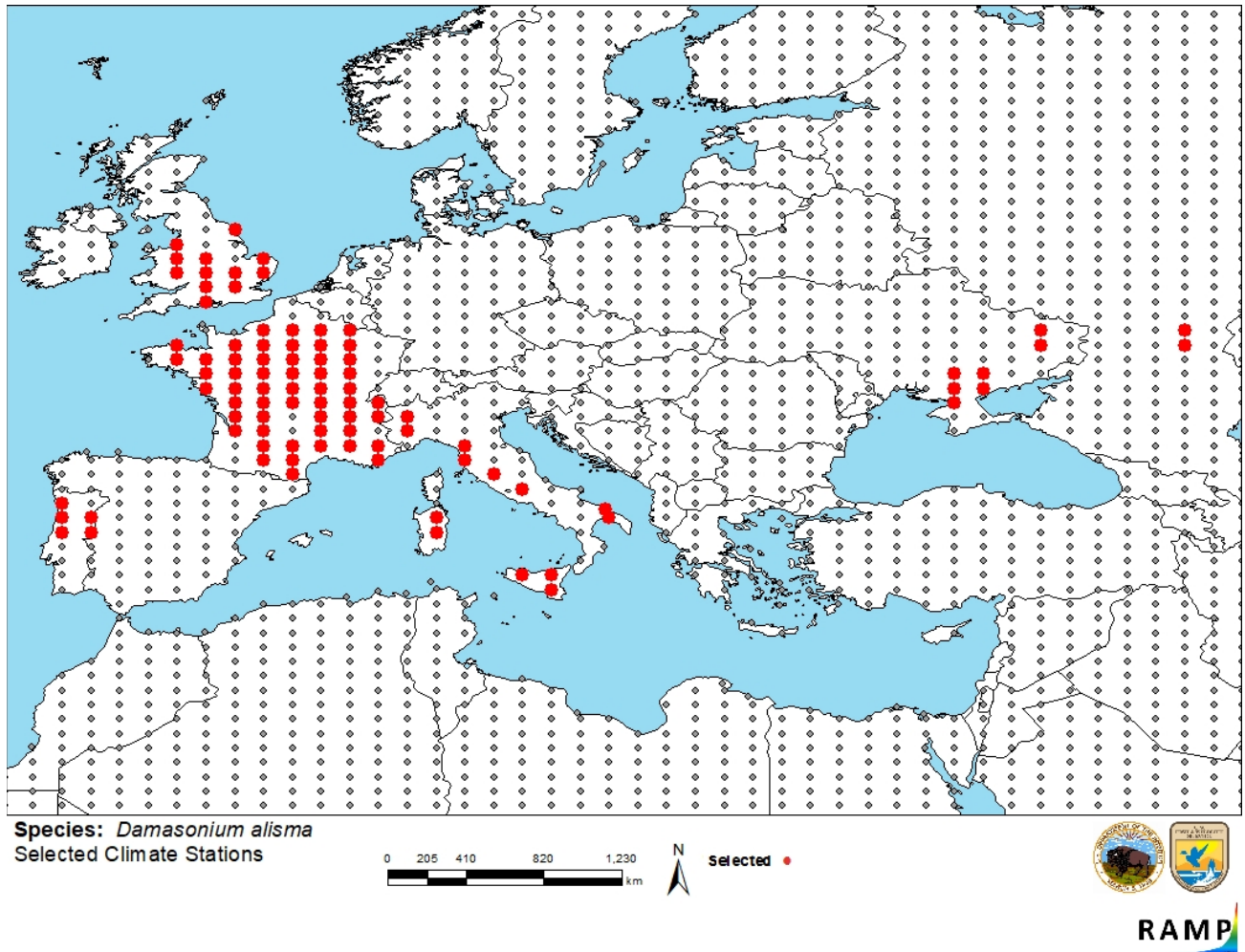
## 7 Climate Matching

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### Summary of Climate Matching Analysis

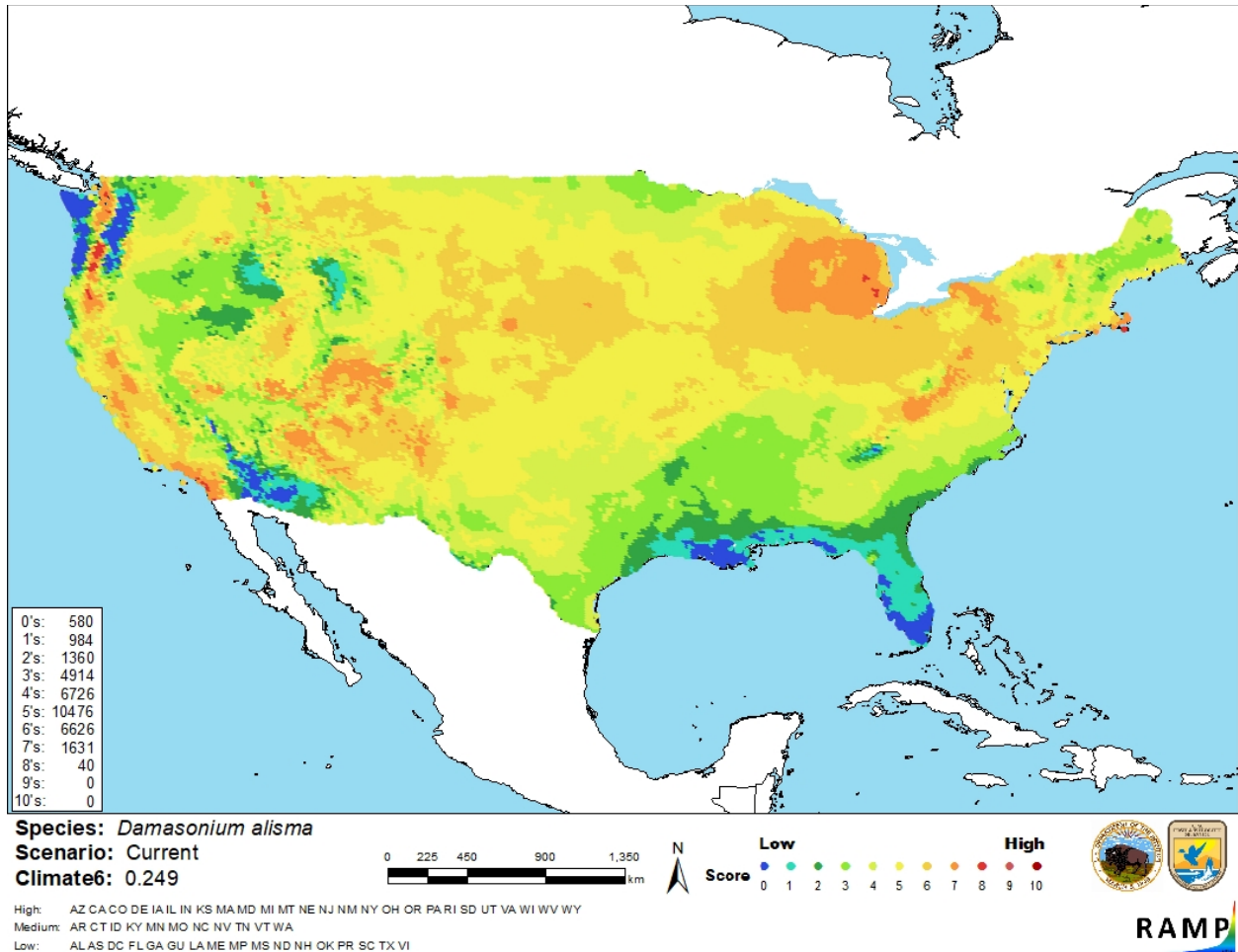
The climate match for *Damasonium alisma* was generally medium to high for most of the contiguous United States. High match is found throughout the Great Lakes region, in the southeastern Midwest, central Great Plains, along the Rocky Mountains and along much of the Pacific Coast. Small patches of low match are found in Washington, southern Arizona, the Upper Midwest, and along the Gulf Coast. All other areas of the contiguous United States had medium match. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) was 0.249, high (scores of 0.103 and above are classified high). The following states had medium individual Climate 6 scores: Arkansas, Connecticut, Idaho, Kentucky, Minnesota, Missouri, North Carolina, Nevada, Tennessee, Vermont, and Washington. The following states had low individual Climate 6 scores: Alabama, Florida, Georgia, Louisiana, Maine, Mississippi,

North Dakota, New Hampshire, Oklahoma, South Carolina, and Texas. All other States had high individual Climate 6 scores.



**Figure 2.** RAMP (Sanders et al. 2018) source map showing weather stations in Europe selected as source locations (red; United Kingdom, Portugal, France, Italy, Ukraine, Russia) and non-source locations (gray) for *Damasonium alisma* climate matching. Source locations from Rich and Nicholls-Vuille (2001) and 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 *Damasonium alisma* in the contiguous United States based on source locations reported by Rich and Nicholls-Vuille (2001) and 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
$\geq 0.103$	High

## 8 Certainty of Assessment

*Damasonium alisma* has not been recorded outside of its native range, nor is this species found in trade. There may be some uncertainty in the understanding of the native range of this species. With no information on history of invasiveness or impacts of introduction, the certainty of assessment is low.

## 9 Risk Assessment

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### Summary of Risk to the Contiguous United States

*Damasonium alisma* is an annual, aquatic plant native to the United Kingdom, France, Italy, Portugal, Ukraine, Russia, and Kazakhstan. This species is listed as Vulnerable on the IUCN Red List. No information on trade history of this species is available. *Damasonium alisma* has not been reported anywhere outside of its native distribution, resulting in a history of invasiveness classified as No Known Nonnative Population. The overall climate match for the contiguous United States is High, with a medium to high climate match throughout most of the country. The certainty of assessment is Low due to a lack of information and questions about the full extent of the range. The overall risk assessment category for *Damasonium alisma* 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:** *Damasonium alisma* is considered vulnerable on the IUCN Red List and has a decreasing population trend.
- **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. 2021. GBIF backbone taxonomy: *Damasonium alisma* Mill. Copenhagen: Global Biodiversity Information Facility. Available: <https://www.gbif.org/species/5328689> (February 2021).

[ITIS] Integrated Taxonomic Information System. 2021. *Damasonium alisma* Mill. Reston, Virginia: Integrated Taxonomic Information System. Available: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=182464#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=182464#null) (February 2021).

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Rich TCG, Nicholls-Vuille FL. 2001. Taxonomy and distribution of European *Damasonium* (*Alismataceae*). *Edinburgh Journal of Botany* 58:45–55.

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## 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.**

Cheffings CM, Farrell L, editors. 2005. The vascular plant Red Data List for Great Britain. Species Status 7. Peterborough, England: Joint Nature Conservation Committee.

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Preston CD, Pearman DA, Dines TD. 2002. New atlas of the British and Irish flora. Oxford: Oxford University Press.

Stace C. 1997. New flora of the British Isles. 2nd Edition. Cambridge, UK: Cambridge University Press.

Wigginton MJ, editor. 1999. British Red Data Books 1 Vascular plants. Peterborough, UK: Joint Nature Conservation Committee.