

Cape pondweed (*Aponogeton distachyos*)

- Native to South Africa, first recorded in the wild in GB in 1889
- Scattered populations in southern England; present in North West and Scotland.
- Can reproduce by ripe fruit and tubers, but mainly spread by human assistance
- Shades native plants and blocks waterways



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History in GB

One of the first Southern Hemisphere aquatic plants to be used in the Northern Hemisphere as an outdoor plant for ornamental water features. First recorded in the wild in 1889 in Middlesex.

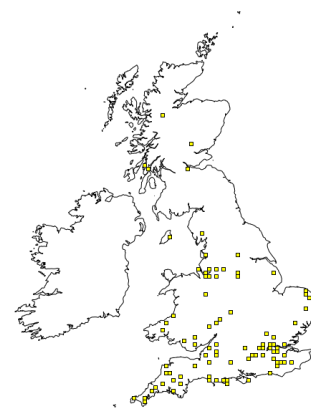
Native distribution

Endemic to Mediterranean climate of Cape of South Africa



Distribution in GB

Scattered populations in southern England, present in 207 ten km squares in 2017, spreading north west



nbn.org.uk accessed 13/01/2017

Impacts

Environmental (low)

- Forms a dense stand that shades native aquatic plants and blocks waterways
- Affected by algal blooms and muddy water and it shows sensitivity to herbicides and insecticides
- Does not appear to compete with other floating aquatic plants

Economic

- None known

Social

- None known

Introduction pathway

Grown as ornamental in outdoor water features, it has escaped from these and established

Spread pathways

Natural (slow) - Has been known to reproduce by seed, but shows little sign of spreading naturally

Human-aided (moderate) – Spread to new sites is mostly via escape from outdoor water features

Summary

	Risk	Confidence
Entry	VERY LIKELY	VERY HIGH
Establishment	VERY LIKELY	HIGH
Spread	INTERMEDIATE	HIGH
Impacts	MINOR	LOW
Conclusion	MODERATE	MEDIUM

Information about GB Non-native Species Risk Assessments

The Convention on Biological Diversity (CBD) emphasises the need for a precautionary approach towards non-native species where there is often a lack of firm scientific evidence. It also strongly promotes the use of good quality risk assessment to help underpin this approach. The GB risk analysis mechanism has been developed to help facilitate such an approach in Great Britain. It complies with the CBD and reflects standards used by other schemes such as the Intergovernmental Panel on Climate Change, European Plant Protection Organisation and European Food Safety Authority to ensure good practice.

Risk assessments, along with other information, are used to help support decision making in Great Britain. They do not in themselves determine government policy.

The Non-native Species Secretariat (NNSS) manages the risk analysis process on behalf of the GB Programme Board for Non-native Species. Risk assessments are carried out by independent experts from a range of organisations. As part of the risk analysis process risk assessments are:

- Completed using a consistent risk assessment template to ensure that the full range of issues recognised in international standards are addressed.
- Drafted by an independent expert on the species and peer reviewed by a different expert.
- Approved by an independent risk analysis panel (known as the Non-native Species Risk Analysis Panel or NNRAP) only when they are satisfied the assessment is fit-for-purpose.
- Approved for publication by the GB Programme Board for Non-native Species.
- Placed on the GB Non-native Species Secretariat (NNSS) website for a three month period of public comment.
- Finalised by the risk assessor to the satisfaction of the NNRAP.

To find out more about the risk analysis mechanism go to: www.nonnativespecies.org

Common misconceptions about risk assessments

To address a number of common misconceptions about non-native species risk assessments, the following points should be noted:

- Risk assessments consider only the risks posed by a species. They do not consider the practicalities, impacts or other issues relating to the management of the species. They therefore cannot on their own be used to determine what, if any, management response should be undertaken.
- Risk assessments are about negative impacts and are not meant to consider positive impacts that may also occur. The positive impacts would be considered as part of an overall policy decision.
- Risk assessments are advisory and therefore part of the suite of information on which policy decisions are based.
- Completed risk assessments are not final and absolute. Substantive new scientific evidence may prompt a re-evaluation of the risks and/or a change of policy.

Period for comment

Draft risk assessments are available for a period of three months from the date of posting on the NNSS website*. During this time stakeholders are invited to comment on the scientific evidence which underpins the assessments or provide information on other relevant evidence or research that may be available. Relevant comments are collated by the NNSS and sent to the risk assessor. The assessor reviews the comments and, if necessary, amends the risk assessment. The final risk assessment is then checked and approved by the NNRAP.

*risk assessments are posted online at: <http://www.nonnativespecies.org/index.cfm?pageid=143>
comments should be emailed to nnss@apha.gov.uk

Rapid Assessment of: *Aponogeton distachyos* L.f (Cape Pondweed)

Author: Manuel A. Duenas and Jonathan R. Newman

Version: Draft 1 (April 2017), Draft 2 (Jan 2017)

Signed off by NNRAP: January 2017

Approved by Programme Board: June 2019

Placed on NNSS website: TBC

Rapid Risk Assessment:

1 - What is the principal reason for performing the Risk Assessment? (Include any other reasons as comments)

Response: *To assess the potential risk of Aponogeton distachyos L.f to Great Britain*

2 - What is the Risk Assessment Area?

Response: GB (Scotland, England and Wales and their islands)

3 - What is the name of the organism? (Other names used for the organism can be entered in the comments box)

Response:

Aponogeton distachyos L.f

Synonyms:

Aponogeton distachyos var. *Langrangei* André

Aponogeton distachyon L. f., orth. var.

Aponogeton distachyon

Aponogeton distachyus

Common names:

Cape pondweed, Cape hawthorn, Cape water hawthorn, Water hawthorn, Cape pond lily, Cape asparagus

4 - Is the organism in its present range known to be invasive?

Response: Yes

Native of South Africa (Cape Province). In its non-native range, it is established in New Zealand, first recorded in 1870 (Waimate N, Northland). In New Zealand, it is present throughout NI and SI (Champion *et al.*, 2002). Currently, widely naturalised and locally abundant populations in coastal and lowland NI localities. Occurs in SI at Blenheim in Marlborough, in some lakes in Canterbury and Westland, near Dunedin and near Lake Te Anau (Champion and Hofstra, 2013; Champion, 2013). It is established in some parts of south-eastern Australia (central and southern New South Wales, southern Victoria, Tasmania and south-eastern South Australia) (Randall and Kessal, 2004; Queensland Government, 2011).

In South America, it is recorded in Chile (Santo Domingo lagoon, Valdivia province) (San Martin *et al.*, 1998, 1994). In the North Hemisphere, it is established in the USA in central-coastal and southern California (FNA, 2008; Thorne, 2012). Present in Ireland and the Netherlands, where it was first recorded in 1980 (NOBANIS, 2013). In Belgium, it was first recorded in 1993 (Wallonia region) but not really well established (Verloove, 2006). It is also established in France (DAISIE, 2013), recorded for first time in 2000 (Limousin region) (Chabrol *et al.*, 2007).

In UK, it was recorded in the wild by 1889 (Middlesex), and now appears to be recorded with increasing

frequency (Preston and Croft, 1997).

Aponogeton distachyos has been recognized as a high priority weed species in the west coast of New Zealand (Department of Conservation Te Papa Atawhai, 2010). In Australia, this species has been classified with other potential high-risk weeds (SVDSE, 2008), and it is regarded as an environmental weed in Victoria region and other parts of south-eastern Australia (Randall and Kessal, 2004), where it is invasive and spreading in conservation areas. (Queensland Government, 2011)

5 - What is the current distribution status of the organism with respect to the Risk Assessment Area?

Response:

A. distachyos is widespread in southern England, from the south east to the south west, as well as in the south of eastern England and in the south of Wales. It is also present in the North West and in Scotland (NBN, 2017). It is currently recorded in 207 ten km squares in the UK (NBN gateway, 13/01/2017)

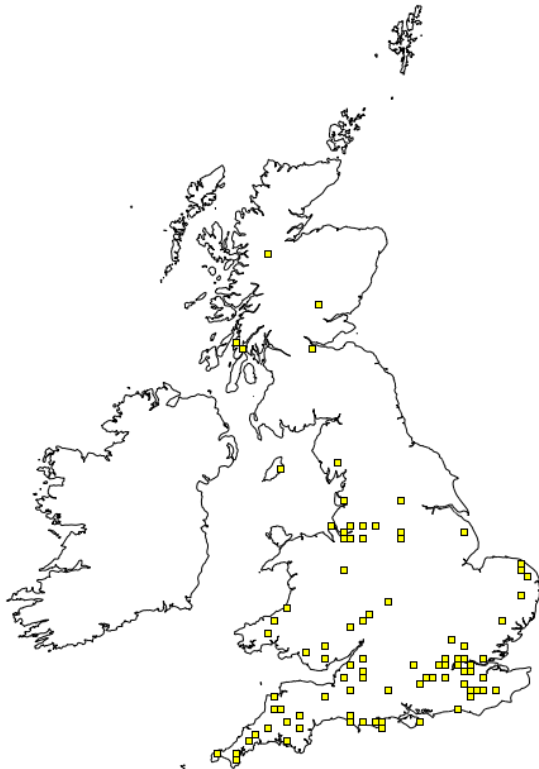


Figure 1 Distribution of *A. distachyos* in GB. Data from nbn.org.uk accessed 13/01/2017

6 - Are there conditions present in the Risk Assessment Area that would enable the organism to survive and reproduce? Comment on any special conditions required by the species?

Response: Yes.

The conditions in the RAA enable *A. distachyos* to survive and reproduce. It has been present in southern England since 1889 (Middlesex) and now appears to be recorded with increasing frequency (Preston and Croft, 1997).

7 - Does the known geographical distribution of the organism include ecoclimatic zones comparable with those of the Risk Assessment Area or sufficiently similar for the organism to survive and thrive?

Response: Yes.

Aponogeton distachyos is endemic to the relatively dry Mediterranean climate area of the Cape of South Africa (Pemberton, 2000), but it is best suited to grow in a temperate climate (van Bruggen, 1973).

8 - Has the organism established viable (reproducing) populations anywhere outside of its native range?

Response: Yes

In all countries outside its native range (see question 4) it has established viable populations.

9 - Can the organism spread rapidly by natural means or by human assistance?

Response: Yes.

Seeds prolifically produced, seeds water dispersed. Ripe fruit can float for a short time before release of the negatively buoyant seeds and in flowing water the plant can be dispersed over considerable distance (Champion and Hofstra, 2013). It has been known to reproduce by seed in Britain, but shows little sign of spreading to new sites without human assistance. (Preston & Croft, 1997)

10 - Could the organism as such, or acting as a vector, cause economic, environmental or social harm in the Risk Assessment Area?

Response: Yes

Aponogeton distachyos can alter and change the physical and chemical characteristics of the invaded aquatic habitat. It can form very dense stands which shade the native submerged aquatic plant and can block waterways and contribute to flooding (Queensland Government, 2011).

Entry Summary

Estimate the overall likelihood of entry into the Risk Assessment Area for this organism (comment on key issues that lead to this conclusion).

Response: *very likely, already present in RAA*

Confidence: *very high*

Comments (include list of entry pathways in your comments):

Aponogeton distachyos was one of the first Southern Hemisphere aquatic plants to be used in the Northern Hemisphere as an outdoor plant. This species was first cultivated in Britain in 1788. It was recorded in the wild by 1889 (Middlesex) and now appears to be recorded with increasing frequency (Preston and Croft, 1997). The principal pathway is by horticulture – as water-garden plants (Verloove, 2006; NOBANIS; 2013) and for aquariums (Thorne, 2012).

This species is grown as an ornamental in outdoor aquariums and water features. It is popular because it grows and flowers during the winter months and for its hawthorn-scented white flowers, and so is widely sold in nurseries and via the internet. Sometimes it escapes from cultivation and becomes naturalized in places with a favourable climate (van Bruggen, 1973). In Australia, it is listed as a common invasive garden escape (Queensland Government, 2011).

A Google search for “*Aponogeton distachyos*” (Jan 2017) turned up 1,700 sites, with only 4 related to the shopping category, however, it is considered as a common stock plant by aquatic nurseries.

Establishment Summary

Estimate the overall likelihood of establishment (comment on key issues that lead to this conclusion).

Response: *very likely*
Confidence: *high*

Aponogeton distachyos is a freshwater, aquatic, rooted perennial plant with submerged and floating leaves. It is found naturally in freshwater marshes and other shallow wetlands, water bodies and slowly running streams between 100m and 300m above sea-level (van Bruggen, 1973). It normally grows in water from 1m to 2m deep (van Bruggen, 1973). Outside its native range it has also been found in lakes (NOBANIS, 2013; UKTAG 2013) and lowland areas in the UK (Preston CD, Croft JM. 1997) and in lentic, shallow and brackish waters with a muddy substrate (San Martin et al., 1994).

A. distachyos is native of the Cape of South Africa, which has a Mediterranean climate (Pemberton, 2000,) but is well adapted in zones with temperate climatic conditions (van Bruggen, 1973) that exist in the RAA, where it has become widely established. It may persist as a relic of cultivation, or at sites where it has been deliberately introduced into the wild (Preston & Croft, 1997).

Spread Summary

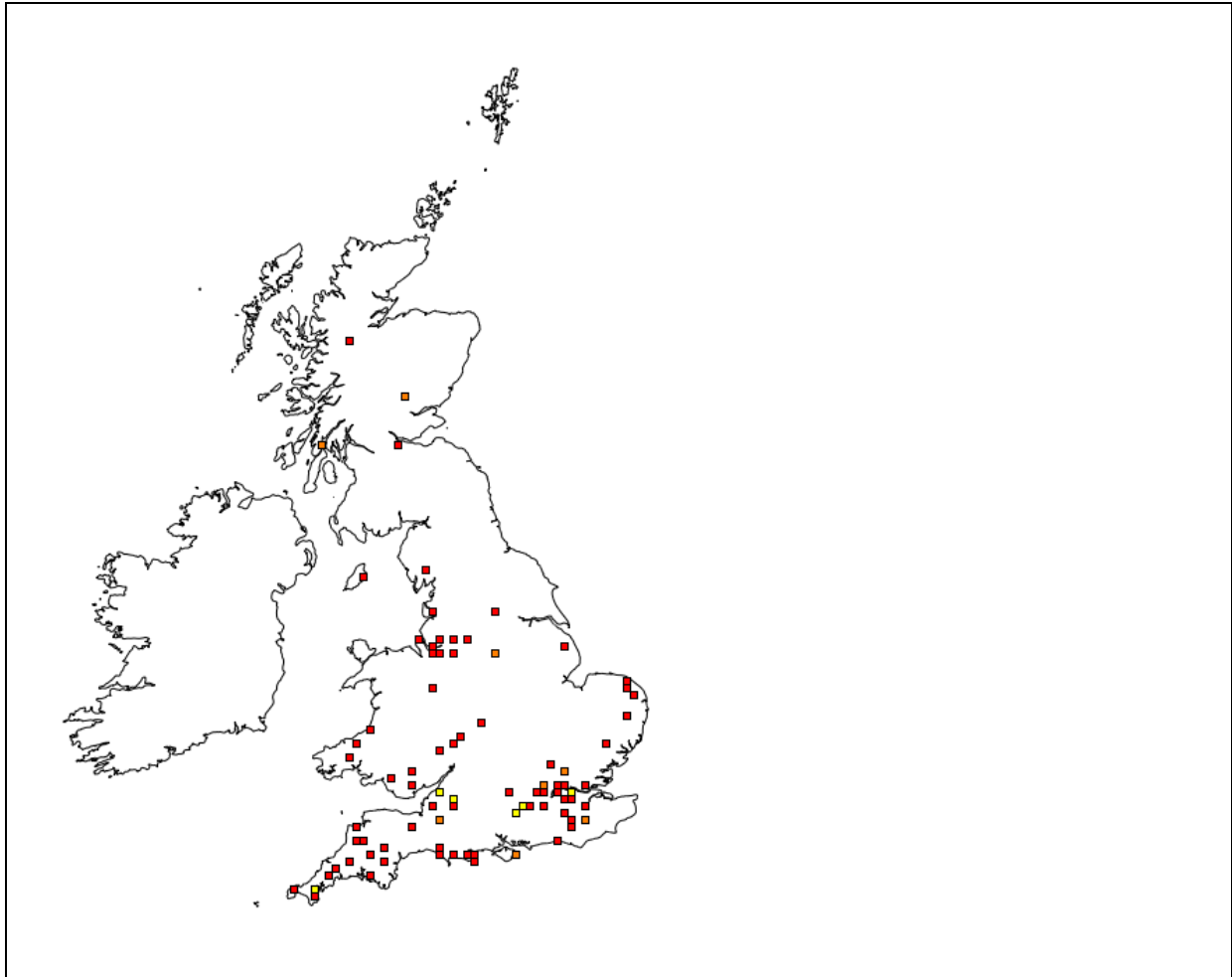
Estimate overall potential for spread (comment on key issues that lead to this conclusion).

Response: *intermediate*
Confidence: *high*

Comments (include list of spread pathways in your comments)

This species spreads by ripe fruit, which can float for a short time before the release of the negatively buoyant seeds in high numbers; in flowing water the plant can be dispersed over considerable distances (Champion and Hofstra, 2013); it can also disperse by tubers (Queensland Government, 2011). It has been known to reproduce by seed in the RAA, but shows little sign of spreading to new sites without human assistance. (Preston & Croft, 1997).

In the map below taken from the NBN gateway (accessed January 2017) the red squares indicate occurrences recorded since 1981, orange between 1950 and 1980 and yellow pre-1950. These data are indicative of a spread to the North West in the last 40 years; however, the rate cannot be measured using the available data.



Impact Summary

Estimate overall severity of impact (comment on key issues that lead to this conclusion)

Response: *minor*

Confidence: *high*

Comments (include list of impacts in your comments):

Aponogeton distachyos can alter and change the physical and chemical characteristics of an invaded aquatic habitat. It can form a very dense stand, which can shade the native submerged aquatic plant and block waterways and contribute to flooding (Queensland Government, 2011).

Aponogeton distachyos has recently become a popular food plant in South Africa, where it is now cultivated intensively (Gunasekera 2003; Pemberton 2000). The population under cultivation is affected by algal blooms and muddy water (Arkcoll, 1996), and it shows sensitivity to herbicides and insecticides. In addition, it does not compete with other floating aquatic plants such as pondweeds (Pemberton, 2000). In New Zealand, it causes minor impact in still and flowing water, but it appears to have disappeared from many former northern sites, possibly displaced by more invasive species (Champion, *et al.*, 2013).

In the UK, this species is considered to have a low impact (UK TAG, 2013); there is little evidence to suggest otherwise at the current stage of invasion.

This species has raised concern amongst some botanists (Natural England, 2011), and in Ireland it is considered

potentially invasive. It is currently listed in the Amber list as a problematic plant and a potential invasive species (Reynolds, 2000; National Biodiversity Data Centre, 2009; Invasive species Ireland, 2013). In previous risk assessments it is considered to be a moderate risk taxa (Natural England, 2011; Plantlife, 2010) and is classified as low impact by the UKTAG (2013), in spite of the fact that this species should be monitored for range expansion and potential impact.

Climate Change

What is the likelihood that the risk posed by this species will increase as a result of climate change?

Response: *high*
Confidence: *high*

Comments (include aspects of species biology likely to be effected by climate change (e.g. ability to establish, key impacts that might change and timescale over which significant change may occur):

Any increase of temperature due to climate change is likely to increase the spread of the current southern distribution in the RRA, and may possibly enable it to spread further north.

Conclusion

Estimate the overall risk (comment on the key issues that lead to this conclusion).

Response: *medium*
Confidence: *medium*

Comments:

This species has raised concern amongst some botanists (Natural England, 2011), and in Ireland it is considered potentially invasive. It is currently listed in the Amber list as a problematic plant and a potential invasive species (Reynolds, 2000; National Biodiversity Data Centre, 2009; Invasive species Ireland, 2013). In previous risk assessments it is considered to be a moderate risk taxa (Natural England, 2011; Plantlife, 2010) and is classified as low impact by the UKTAG (2013), in spite of the fact that this species should be monitored for range expansion and potential impact.

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Provide here a list of the references cited in the course of completing assessment

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