Giant Salvinia (*Salvinia molesta*)

- Floating fern composed of branched stems with pairs of leaves. Leaves are 2-3cm long with a distinctive fold in the centre.
- Not yet recorded in the wild in GB.
- Environmental conditions mean that this species would not currently survive over winter in GB.
- In tropical areas *S. molesta* can form dense carpets over open water crowding out other plants and animals, preventing recreational use and causing flooding.

History in GB

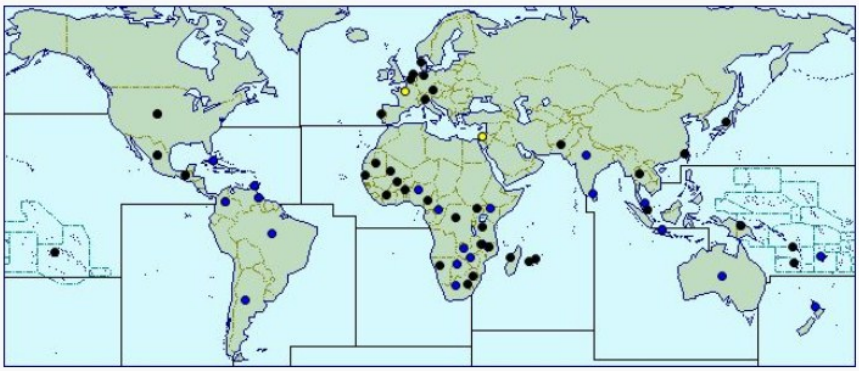
Not currently present in GB, but there have been occasional temporary summer occurrences as a result of escape from gardens. *S. molesta* is frost sensitive and would not currently survive most winters anywhere in the risk assessment area.

Distribution

Native to South America (Brazil).

No native range or European distribution maps could be found.

The map provided (from CABI) indicates global distribution of this species.



Impacts

Likely to have a low impact as it can only survive for one summer and does not overwinter.

Environmental
- Dense populations could impact on other vegetation through exclusion and shading.

Economic
- In tropical areas the dense carpets formed by *S. molesta* can cause flooding.

Social
- In tropical areas the dense carpets formed by *S. molesta* can prevent recreational use of waterbodies.

Introduction pathways

Ornamental - already present and sold in the risk assessment area.

Spread pathways

Human - through horticulture sales.

Natural - through waterbodies, natural growth would only be possible during a few weeks in the summer in the risk assessment area

Summary

	Risk	Confidence
Entry	VERY LIKELY	VERY HIGH
Establishment	VERY UNLIKELY	HIGH
Spread	VERY SLOW	HIGH
Impacts	MINIMAL	HIGH
Conclusion	LOW	HIGH

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:
https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=51
comments should be emailed to nnss@apha.gsi.gov.uk

Rapid Assessment of: *Salvinia molesta* Mitchell, Giant Salvinia
Author: Jonathan Newman

Version: Final (April 2016) – Draft 1 (March 2012), Peer review (March 2014), NNRAP 1st review (September 2014), Draft 2 (January 2015)
Signed off by NNRAP: September 2014
Approved by Programme Board: September 2015
Placed on NNSS website: November 2015

GB Non-native species Rapid Risk Assessment (NRRA)

Introduction:
The rapid risk assessment is used to assess invasive non-native species more rapidly than the larger GB Non-native Risk Assessment. The principles remain the same, relying on scientific knowledge of the species, expert judgement and peer review. For some species the rapid assessment alone will be sufficient, others may go on to be assessed under the larger scheme if requested by the Non-native Species Programme Board.

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

Response: To assess the risk to the RAA of *Salvinia molesta* Mitchell, Giant Salvinia

2 - What is the Risk Assessment Area?

Response: Great Britain

3 - What is the name of the organism (scientific and accepted common; include common synonyms and notes on taxonomic complexity if relevant)?

Response: *Salvinia molesta* Mitchell, Giant Salvinia (possibly = *S. adnata* Desv.). The endangered European native *S. natans* is not present in the UK.

4 - Is the organism known to be invasive anywhere in the world?

Response: Yes

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

Response: None known

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 (extremely marginal – frost sensitive and would not currently survive most winters anywhere in the UK)

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: no

8 - Has the organism established viable (reproducing) populations anywhere outside of its native range (do not answer this question if you have answered 'yes' to question 4)?

Response: n/a

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

Response: Yes

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

Response: No

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*

Confidence: *very high*

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

Already present and sold in the RAA
e.g. http://compare.ebay.co.uk/like/130659728100?var=lv&ltyp=AllFixedPriceItemTypes&var=sbar&cbt=y
as *S. natans*

Establishment Summary

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

Response: *very unlikely*

Confidence: *high*

Comments (state where in GB this species could establish in your comments, include map if possible):

There are no records of this species in the RAA (NBN Gateway Accessed 2nd April 2012), but this does not include occasional temporary summer occurrences as a consequence of garden escape. Owens (*et al.*, 2004) demonstrated that freezing conditions with ice formation for several days killed all plants, and given that conditions in the RAA normally include at least one freezing event below -3°C in each winter, this is likely to prevent establishment for longer than one growing season.

Spread Summary

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

Response: *very slow*

Confidence: *high*

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

Pathways of spread include horticultural sales and lifestyle sales (e.g. Ikea). Spread between static waterbodies under natural conditions would only occur if the waterbodies were linked by flowing water. Growth can only occur for a few weeks in the summer in the RAA. There is little risk of spread of viable plants at this time as water levels are usually low and flows are reduced.

Impact Summary

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

Response: *minimal*

Confidence: *high*

Comments (include list of impacts in your comments):

The species is likely to have a low impact because it can only survive for one summer and does not overwinter (, Owens *et al.*, 2004; Whiteman & Room, 1991). However, where occurrences are dense, local impacts may be high on submerged and other floating native vegetation, caused by exclusion and shading.

Climate Change

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

Response: *medium*

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):

A moderate increase in winter temperatures, resulting in frost free winters (Owens *et al.*, 2004) would allow this species to overwinter and spread much more rapidly through systems. Therefore some regions of the RAA would be especially at risk, *e.g.* all static waters and canals in the SW of the RAA.

http://www.cabi.org/isc/datasheetreport?dsid=48447 states that the absolute minimum air temperature for this species is 10°C. The average minimum temperature in the warmest part of the south west of the RAA between November and March is between 7 – 8°C , so an average warming of about 3 °C would be required to reach the absolute minimum temperature for survival of this species. This is only anticipated to be reached between 2090 and 2099 in one of 6 possible climate change scenarios. I consider this unlikely.

It has been reported from Italy in the Fosso dell'Acqua calda near Pisa , the name of which translates as the Canal of Hot Water, implying conditions might be somewhat more favourable here. It is present in two other locations in Italy, and it has also been found in a reservoir in Corsica, but not on the French mainland; it is also reported from the Algarve in Portugal.

Conclusion

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

Response: *low*

Confidence: *high*

Comments:

The current risk of this species to waterbodies in the RAA is low, due to the inability to survive relatively short term freezing events. However, with climate change and the possibility of frost free winters, the species would be able to survive and establish viable overwintering perennial populations and the risk would increase to high

or very high.

Management options (brief summary):

1 - Has the species been managed elsewhere? If so, how effective has management been?

Response:
Yes. Biological control is very effective (Coetzee *et al.*, 2011; Cilliers, 1986, Room, 1988)

2 - List the available control / eradication options for this organism and indicate their efficacy.

Response:
Biological control. Very effective (Coetzee et al., 2011; Cilliers, 1986, Room, 1988)

3 - List the available pathway management options (to reduce spread) for this organism and indicate their efficacy.

Response:
Specific measures this species are probably not required until 2100

4 - How quickly would management need to be implemented in order to work?

Response:
At the moment, mechanical removal of small mats is possible during the summer and exposure to freezing temperatures with ice formation will control any plants left after removal. Control of larger patches would need to be undertaken using biological control in summer conditions.

References

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

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