RISK ASSESSMENT SUMMARY SHEET

Orange balsam (*Impatiens capensis*)

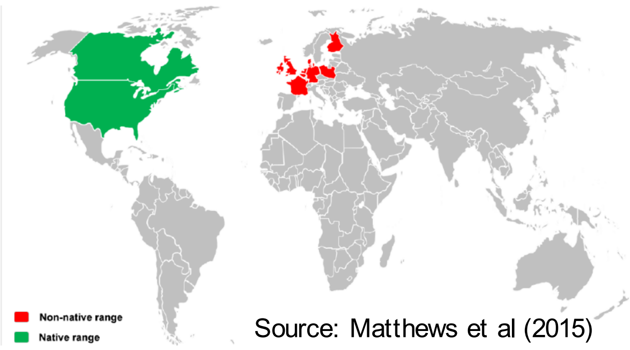
- An erect herbaceous annual plant, growing to 1.5m tall, with orange flowers.
- Originally from North America, with non-native populations in Asia and throughout Europe.
- Present in GB for over 100 years.
- No significant impacts recorded to date - generally does not form large dense stands like those of Himalayan balsam.

Photograph: D Gordon E Robertson, Wikimedia

History in GB

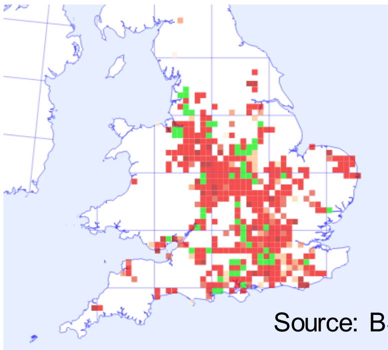
First recorded in 1822 and established in the wild by 1884. Now distributed primarily along lowland rivers and canals in central and southern England as well as Norfolk and the midlands – with limited occurrences in other parts of England. Only one record from the River Tweed in Scotland and few records in Wales, mainly in the southeast.

Global Distribution



Source: Matthews et al (2015)

GB Distribution



Source: BSBI 2021

Impacts

This species has been present in the wild for over 100 years with no impacts reported. However, some impacts may occur if the species were to spread more rapidly or form denser stands.

Environmental (minor, medium)

- None reported in GB to date. However, there is evidence elsewhere in the world that the species can form dense stands and outcompete native species.

Economic (minimal, high confidence)

- None recorded

Societal (minimal, high confidence)

- None recorded

Introduction pathway

Originally introduced to GB as a horticultural plant.

Spread pathway

Natural (rapid, v high confidence) – estimated to be spreading at a rate of 13km per year, primarily as a result of seed dispersal along watercourses

Human (very slow, high confidence) – no longer a popular ornamental plant, could be spread accidentally

Summary

	Response	Confidence
Entry	VERY LIKELY	VERY HIGH
Establishment	VERY LIKELY	VERY HIGH
Spread	SLOW	MEDIUM
Impact	MINOR	MEDIUM
Overall risk	LOW	MEDIUM

RISK ASSESSMENT COVERING PAGE - ABOUT THE PROCESS

It is important that policy decisions and action within Great Britain are underpinned by evidence. At the same time it is not always possible to have complete scientific certainty before taking action. To determine the evidence base and manage uncertainty a process of risk analysis is used.

Risk analysis comprises three component parts: risk assessment (determining the severity and likelihood of a hazard occurring); risk management (the practicalities of reducing the risk); and risk communication (interpreting the results of the analysis and explaining them clearly). This tool relates to risk assessment only. The Non-native Species Secretariat manages the risk analysis process on behalf of the GB Programme Board for Non-native Species. During this process risk assessments are:

- Commissioned using a consistent template to ensure the full range of issues is addressed and maintain comparable quality of risk and confidence scoring supported by appropriate evidence.
- Drafted by an independent expert in the species and peer reviewed by a different expert.
- Approved by the NNRAP (an independent risk analysis panel) only when they are satisfied the assessment is fit-for-purpose.
- Approved 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 and GB Programme Board if necessary.

Common misconceptions about risk assessments

The risk assessments:

- Consider only the risks (i.e. the chance and severity of a hazard occurring) posed by a species. They do not consider the practicalities, impacts or other issues relating to the management of the species. They also only consider only the negative impacts of the species, they do not consider any positive effects. They therefore cannot on their own be used to determine what, if any, management response should be undertaken.
- Are advisory and therefore part of the suite of information on which policy decisions are based.
- Are not final and absolute. They are an assessment based on the evidence available at that time. Substantive new scientific evidence may prompt a re-evaluation of the risks and/or a change of policy.

Period for comment

Once placed on the NNSS website, risk assessments are open for stakeholders to provide comment on the scientific evidence which underpins them for three months. Relevant comments are collated by the NNSS and sent to the risk assessor for them to consider and, if necessary, amend the risk assessment. Where significant comments are received the NNRAP will determine whether the final risk assessment suitably takes into account the comments provided.

To find out more: published risk assessments and more information can be found at http://www.nonnativespecies.org/index.cfm?pageid=143

GB NON-NATIVE ORGANISM RISK ASSESSMENT SCHEME

Name of organism: *Impatiens capensis* (orange balsam)
Author: Katharina Dehnen-Schmutz
Risk Assessment Area: Great Britain
Version: Draft 1 (*September 2020*), NNRAP 1 (*September 2020*), Draft 2 (*October 2020*), NNRAP 2 (*December 2020*), Draft 3 (*January 2021*)
Signed off by NNRAP: December 2020
Approved by Programme Board: September 2021
Placed on NNSS website: February 2022

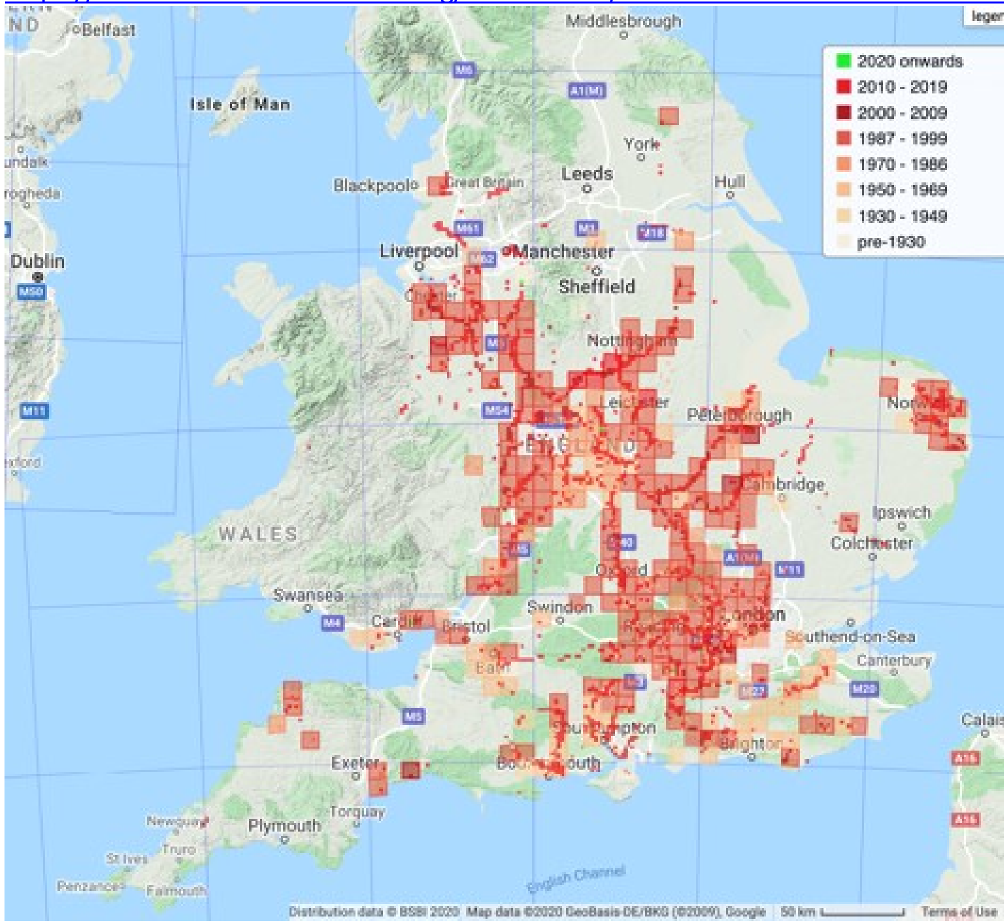
What is the principal reason for performing the Risk Assessment?

This assessment has been commissioned after queries about the potential risk of this species were received from stakeholders.

SECTION A – Organism Information and Screening	
Stage 1. Organism Information	**RESPONSE**
1. Identify the organism. Is it clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?	Yes. *Impatiens capensis* Meerb., Orange Balsam, is an erect annual herbaceous plant growing up to 1.5 m. The 2-3.5cm flowers of orange colour with brownish blotches clearly distinguish *I. capensis* from the four other *Impatiens* species found in Britain (C. Stace, 2019).
2. If not a single taxonomic entity, can it be redefined? (if necessary use the response box to re-define the organism and carry on)	NA
3. Does a relevant earlier risk assessment exist? (give details of any previous risk assessment)	No
4. If there is an earlier risk assessment is it still entirely valid, or only partly valid?	NA
5. Where is the organism native?	North America. Eastern north America (Tabak & von Wettberg, 2008), with occurrences in the Pacific Northwest probably the result of a more recent range expansion and added to the noxious weed list in Washington State in 2018 (https://www.nwcb.wa.gov/weeds/spotted-jewelweed)
6. What is the global distribution of the organism (excluding the risk assessment area)?	North America, southern and western Europe, East Asia.
7. What is the distribution of the organism in the risk assessment area?	The first record of *Impatiens capensis* from the risk assessment area dates from 1822 in Surrey where it was considered naturalised by 1884 (Perrins et al., 1993). Now the species is distributed along lowland rivers and canals in central and southern England as well as Norfolk, with only scattered occurrences in the southwest of England. In the north of England, the distribution is limited up to Lancashire (River Ribble) and Yorkshire (River

Derwent). There is one record from the River Tweed in Scotland, and only few records in Wales, mainly in the southeast.

https://scotland-records.nbnatlas.org/occurrences/7b7030ab-60b1-4258-beba-74aa47cd3034



BSBI Distribution map of I. capensis

8. Is the organism known to be invasive (i.e. to threaten organisms, habitats or ecosystems) anywhere in the world?	Yes. According to the GRIIS database (Global register of introduced and invasive species), *I. capensis* has been introduced to eight countries and three of these have reported evidence of impact (i.e. Denmark, Finland, Japan). For Europe, the NOBANIS database lists the species as invasive in Finland, Denmark and Poland (https://www.nobanis.org/species-info/?taxaID=842, accessed 29/08/20). https://www.gbif.org/species/2891774
9. Describe any known socio-economic benefits of the organism in the risk assessment area.	The species is available as an ornamental plant in the risk assessment area. It is also used for medicinal purposes, although it is not known if this is relevant in the risk assessment area.
10. Has this risk assessment been requested by the GB Programme Board? (If uncertain check with the Non-native Species Secretariat)	Yes

SECTION B – Detailed assessment			
PROBABILITY OF ENTRY			
Important instructions: • Entry is the introduction of an organism into the risk assessment area. Not to be confused with spread, the movement of an organism within the risk assessment area. • For organisms which are already present in the risk assessment area, only complete the entry section for current active pathways of entry or if relevant potential future pathways. The entry section need not be completed for organisms which have entered in the past and have no current pathways of entry.			
QUESTION	**RESPONSE**	**CONFIDENCE**	**COMMENT**
1.1. How many active pathways are relevant to the potential entry of this organism? (If there are no active pathways or potential future pathways respond N/A and move to the Establishment section)	very few	high	
1.2. List relevant pathways through which the organism could enter. Where possible give detail about the specific origins and end points of the pathways. For each pathway answer questions 1.3 to 1.10 (copy and paste additional rows at the end of this section as necessary).	i. ornamental horticulture ii. medicinal use		i. ornamental horticulture: very limited trade of seeds from UK based nurseries (and origin of seeds unclear), but seeds are offered from North America to UK consumers through online marketplaces ii. medicinal use: dried plant material of *I. capensis* is offered from North America to UK consumers through online marketplaces
Pathway name:	i. ornamental horticulture		

i.1.3. Is entry along this pathway intentional (e.g. the organism is imported for trade) or accidental (the organism is a contaminant of imported goods)? (If intentional, only answer questions 1.4, 1.9, 1.10, 1.11)	intentional	very high	*Impatiens capensis* was first introduced to Britain for horticultural purposes as an ornamental plant (C. A. Stace & Crawley, 2015)(Clement & Foster, 1994) and this pathway is still active.
i.1.4. How likely is it that large numbers of the organism will travel along this pathway from the point(s) of origin over the course of one year? Subnote: In your comment discuss how likely the organism is to get onto the pathway in the first place.	unlikely	high	*Impatiens capensis* is not a very popular garden plant as indicated by the fact that it was last listed in the RHS Plant Finder in 1998 (RHS Plant Finder, online edition, accessed 17th of July 2020). However, seeds were offered for sale online from at least one UK based nursery as well as online trading platforms (Amazon, Etsy, ebay), where the sellers seem to be based in the USA but offering seeds to UK consumers. Very high postage costs are likely to prevent this being an active pathway. Sellers (including the nursery in the UK) also offered a more white/yellowish flowering variety called ‘Autumn Canaries’ which was offered as a “new plant”.
i.1.9. How likely is the organism to be able to transfer from the pathway to a suitable habitat or host?	very likely	very high	Past evidence suggests that *I. capensis* is able to spread from gardens into suitable habitats outside gardens.
i.1.10. Estimate the overall likelihood of entry into the risk assessment area based on this pathway?	likely	very high	Ornamental trade and use of *I. capensis* has been the main pathway of introduction of the species into the risk assessment area. Currently, the plant seems to be less popular as a garden plant, however, it is still available for sale and therefore a likely pathway of entry.
Pathway name:	ii. medicinal use		
ii.1.3. Is entry along this pathway intentional (e.g. the organism is imported for trade) or accidental (the organism is a contaminant of imported goods)? (If intentional, only answer questions 1.4, 1.9, 1.10, 1.11)	intentional	very high	*Impatiens capensis* is used as a traditional herbal remedy in North America to treat skin irritations, in particular those caused by poison ivy (*Toxicodendron radicans*) (Abrams Motz et al., 2012). There is evidence that dried plant material is offered for sale by sellers based in the USA on online platforms in the UK (e.g. on ebay.co.uk or etsy.co.uk, accessed 24/08/2020). This dried plant material could contain seeds.

ii.1.4. How likely is it that large numbers of the organism will travel along this pathway from the point(s) of origin over the course of one year? Subnote: In your comment discuss how likely the organism is to get onto the pathway in the first place.	Very unlikely	low	It is not known if the dried material contains seeds and if it does, how many. For medicinal purposes the dried herb seems to be used and any seeds may just be a contamination. There are only a few sellers (3-5) based in the USA with high postage costs from the USA also likely to deter potential buyers in the UK.
ii.1.9. How likely is the organism to be able to transfer from the pathway to a suitable habitat or host?	unlikely	high	Transfer from the pathway seems only possible by accident or disposal of the dried plant material in a suitable habitat.
ii.1.10. Estimate the overall likelihood of entry into the risk assessment area based on this pathway?	unlikely	high	It seems unlikely that the trade of dried plant material of *I. capensis* for medical purposes will be an active pathway of entry for the species in the risk assessment area.
End of pathway assessment, repeat as necessary.			
1.11. Estimate the overall likelihood of entry into the risk assessment area based on all pathways (comment on the key issues that lead to this conclusion).	very likely	very high	

PROBABILITY OF ESTABLISHMENT

Important instructions:

- For organisms which are already well established in the risk assessment area, only complete questions 1.15, 1.21, 1.28 then move onto the spread section. If uncertain, check with the Non-native Species Secretariat.

QUESTION	RESPONSE	CONFIDENCE	COMMENT
1.15. How widespread are habitats or species necessary for the survival, development and multiplication of the organism in the risk assessment area?	widespread	very high	Moist habitats including lowland river banks with slow moving water, canals, lakes and reservoirs are widespread in the risk assessment area. Further habitats considered suitable like moist woodland clearings, edges of woodland paths, swamps, fens, and roadside ditches (Matthews et al., 2015) are also widely available.
1.21. How likely is it that biological properties of the organism would allow it to survive eradication campaigns in the risk assessment area?	moderately likely	medium	There is little evidence of the control of the species in the risk assessment area, therefore, it is assumed that a similar management regime as for *Impatiens glandulifera* could be applied. However, in contrast to *I. glandulifera,* which is not building a seed bank, seeds of *I. capensis* have been found to remain viable in the soil for up to three years (Perglova, I., Pergl, J., Skalova, H., Moravcova, L., Jarošík, V., & Pyšek, P., 2009), which could make eradication efforts more difficult, but not impossible. Outside the risk assessment area, no evidence of management aiming for eradication of the species has been found, although general advice on the management of the species exists (e.g. Washington State Noxious Weed Control Board).
1.28. Estimate the overall likelihood of establishment (mention any key issues in the comment box).	very likely	very high	

PROBABILITY OF SPREAD

Important notes:

- Spread is defined as the expansion of the geographical distribution of a pest within an area.

QUESTION	RESPONSE	CONFIDENCE	COMMENT
2.1. How important is the expected spread of this organism in the risk assessment area by natural means? (Please list and comment on the mechanisms for natural spread.)	major	very high	Spread by natural means is the main mode of spread of *I. capensis*. The seeds are ejected from the seed capsule reaching a mean dispersal distance of 0.44 m, with few seeds reaching more than 1.5 m (Hayashi et al., 2009). For long distance dispersal the seeds can be transported in water currents and have been shown to float for up to 200 days in experimental settings (Tabak & von Wettberg, 2008). The distribution pattern in the risk assessment area along lowland rivers confirms the importance of hydrochory for the spread of *I. capensis*. Based on temporal data on the presence of the species in vice-counties, Perrins et al. (1993) calculated a spread rate of 13 km per year.
2.2. How important is the expected spread of this organism in the risk assessment area by human assistance? (Please list and comment on the mechanisms for human-assisted spread.)	minimal	high	Interest in the species as an ornamental plant seems to be very limited and it seems unlikely that current levels of ornamental use of the species contribute to its spread. Seeds could also be accidentally transported with machinery or sporting equipment.
2.3. Within the risk assessment area, how difficult would it be to contain the organism?	difficult	medium	Hand pulling of the species along rivers starting upstream could be a possible solution to containment in certain areas. Given the seedbank and survival of seeds for up to 3 years follow up monitoring and control would be necessary making successful management more difficult.
2.4. Based on the answers to questions on the potential for establishment and spread in the risk assessment area, define the area endangered by the organism.	Lowland areas in England, Wales and southern Scotland	medium	Current distribution patterns and past spread suggest that *I. capensis* still has the potential to increase its range as well as increase in abundance in the existing range. Potential for spread exists particularly in river valleys that are currently not or only sparsely colonised, for example the River Wye, the upper Thames valley, the River Ouse and River Derwent in Yorkshire. Past spread over the last 20 – 30 years shows that the species has extended its range for example with new occurrences further north

			(e.g. Yorkshire, southern Scotland) and in the southwest. These currently more localised occurrences could provide starting points for further increase in records and expansion of the range. Within the existing range an increase in density could also occur if the species would spread into more canals, lakes, reservoirs and ditches and fenlands, as described from the Netherlands (Matthews et al., 2015). The maximum altitude at which the species has been recorded is at 167m on the River Manifold in the Peak District National Park (Day, 2010). There is some uncertainty regarding the potential of *I. capensis* to extent its range into areas at higher altitudes. This could be limited by the fact that the species seems to spread mainly naturally along rivers and waterways establishing best in river banks at still water or locations of low water dynamic (Matthews et al. 2015), which could be less frequent habitats at higher altitudes. There are also potential negative impacts of late frosts on seedlings (Skálová et al., 2011). Nevertheless, *I. capensis* is known to occur in colder climates, such as in Denmark, Finland, Poland and Canada. Within the risk assessment area, the species has increased its distribution from 275 hectads up to the year 1999 by about 25% to 345 hectads in 2019 (BSBI database).
2.5. What proportion (%) of the area/habitat suitable for establishment (i.e. those parts of the risk assessment area were the species could establish), if any, has already been colonised by the organism?	10-33	medium	
2.6. What proportion (%) of the area/habitat suitable for establishment, if any, do you expect to have been invaded by the organism five years from now (including any current presence)?	10-33	medium	It is not expected that the species would increase its area above 33% of the suitable habitat within the next five years. This is mainly because natural spread seems not very likely to enable the species to colonise habitats in river catchments in which is it is not currently present and human mediated spread is not considered very important for its spread.

2.7. What other timeframe (in years) would be appropriate to estimate any significant further spread of the organism in the risk assessment area? (Please comment on why this timeframe is chosen.)	20	medium	Data of records in the BSBI distribution database suggest that every 20 years seems to be good timeframe to evaluate changes in distribution and has been used to analyse the rate of spread of the species in Britain before (Perrins et al., 1993).
2.8. In this timeframe what proportion (%) of the endangered area/habitat (including any currently occupied areas/habitats) is likely to have been invaded by this organism?	10-33	medium	It is not expected that the species would increase its area above 33% of the suitable habitat within the next twenty years. This is mainly because natural spread seems not very likely to enable the species to colonise habitats in river catchments in which is it is not currently present and human mediated spread is not considered very important for its spread.
2.9. Estimate the overall potential for future spread for this organism in the risk assessment area (using the comment box to indicate any key issues).	slowly	medium	It is expected that *I. capensis* will continue to spread slowly similar to the spread observed in its past invasion process in the risk assessment area.

PROBABILITY OF IMPACT			
Important instructions: • When assessing potential future impacts, climate change should not be taken into account. This is done in later questions at the end of the assessment. • Where one type of impact may affect another (e.g. disease may also cause economic impact) the assessor should try to separate the effects (e.g. in this case note the economic impact of disease in the response and comments of the disease question, but do not include them in the economic section). • Note questions 2.10-2.14 relate to economic impact and 2.15-2.21 to environmental impact. Each set of questions starts with the impact elsewhere in the world, then considers impacts in the risk assessment area separating known impacts to date (i.e. past and current impacts) from potential future impacts. Key words are in bold for emphasis.			
QUESTION	**RESPONSE**	**CONFIDENCE**	**COMMENTS**
2.10. How great is the economic loss caused by the organism within its existing geographic range **excluding the risk assessment area**, including the cost of any current management?	minimal	high	No evidence of documented economic impacts of *I. capensis* within its existing geographic range excluding the risk assessment area has been found. It seems likely that high economic losses would have been reported.
2.11. How great is the economic cost of the organism **currently** in the risk assessment area **excluding management** costs (include any past costs in your response)?	minimal	high	There is no evidence of any economic cost resulting from impacts of *I. capensis* in the risk assessment area. It seems likely that high economic costs would have been reported.
2.12. How great is the economic cost of the organism likely to be **in the future** in the risk assessment area **excluding management** costs?	minor	low	If the species would establish denser stands (see 2.15), river banks could be weakened due to the shallow root system (Hopfensperger & Engelhardt, 2007; Matthews et al., 2015) and become vulnerable to erosion.
2.13. How great are the economic costs **associated with managing** this organism **currently** in the risk assessment area (include any past costs in your response)?	minimal	high	There is no evidence of any management of the species and control costs in the risk assessment area at the moment. However, anecdotal evidence suggests that the species is controlled in some nature reserves, for example by the Yorkshire Wildlife Trust at Wheldrake Ings (Yorkshire Derwent Partnership via Twitter, 28/08/20).

2.14. How great are the economic costs **associated with managing** this organism likely to be **in the future** in the risk assessment area?	minor	medium	If the species further increases it range and in particular would form more dense stands, it seems likely that management would be undertaken resulting in costs for control and monitoring.
2.15. How important is environmental harm caused by the organism within its existing geographic range **excluding the risk assessment area**?	minor	high	There is very little evidence available with regard to environmental harm caused by I. *capensis* elsewhere. In the Netherlands, the species has been recorded in 15 Natura 2000 sites, however, negative impacts on native biodiversity or ecosystems have not been reported and the risk, that these could occur in the future have been estimated to be small (Matthews et al., 2015). For Poland, Adamowski et al (2018) report observations of the species achieving significant coverage, co-dominating in plots with *I. glandulifera* and even forming its own plant communities. On the east coast of North America, where the species has been classified as non-native, negative impacts are described from high seedling densities that outcompete native species as well as the potential risk of hybridisation with a native Impatiens species (Washington State Noxious Weed Control Board, no date).
2.16. How important is the impact of the organism on biodiversity (e.g. decline in native species, changes in native species communities, hybridisation) **currently** in the risk assessment area (include any past impact in your response)?	minor	high	There are currently no reports of impacts of *I. capensis* on biodiversity in the risk assessment area.
2.17. How important is the impact of the organism on biodiversity likely to be in the **future** in the risk assessment area?	minor	medium	There is a minor risk that *I. capensis* could increase its impact on biodiversity in the future. These impacts depend on the spread of the species and, more importantly, if it would be able to form more dense stands than it currently seems to do. There is some evidence that *I. capensis* can form dense stands that would be able to compete with native vegetation (Adamowski et al. 2018, Washington State Noxious Weed Control Board, nD) and would thus pose a future risk to biodiversity in the risk assessment area. To what extent this would be the case, is difficult to know.

			Skálová et al. (2013) conclude from experimental studies that existing occurrences of *I. glandulifera* could limit the invasion success of *I. capensis* in central and eastern Europe and this could also be the case in the risk assessment area. There is also a risk that the native *I. noli-tangere* could be negatively affected *by I. capensis* as both species use the same habitats. *I. noli-tangere* is the sole native food plant for the endangered moth (*Eustroma reticulatum*), which is confined to the Lake District (Hatcher et al., 2004), which is also the area where *I. noli-tangere* has its main distribution centre in Britain. Currently, *I. capensis* is not present in the Lake District, however, should it colonise the area it could compete with *I. noli-tangere* in the same habitats posing a threat not just to the species itself but also to the moth. However, the BRC Atlas of Insects and their Food Plants, also lists *I. capensis* as a food plant for *Eustroma reticulatum*, (http://www.brc.ac.uk/dbif/hostsresults.aspx?hostid=2782), although it is not known if it could fully replace the native Impatiens species. In experimental studies *I. capensis* did not significantly reduce biomass of *I. noli-tangere*, but had negative impacts on its stem height and branching (Skálová et al., 2013)
2.18. How important is alteration of ecosystem function (e.g. habitat change, nutrient cycling, trophic interactions), including losses to ecosystem services, caused by the organism **currently** in the risk assessment area (include any past impact in your response)?	minimal	high	Current ecosystem changes are likely to be minimal and have not been reported.
2.19. How important is alteration of ecosystem function (e.g. habitat change, nutrient cycling, trophic interactions), including losses to	minor	low	Changes in ecosystem function could occur if *I. capensis* became a more dominant species in the habitats it invades, for example through soil

ecosystem services, caused by the organism likely to be in the risk assessment area in the **future**?			erosion caused by exposing the soil in the winter months when the annual *I. capensis* does not grow.
2.20. How important is decline in conservation status (e.g. sites of nature conservation value, WFD classification) caused by the organism **currently** in the risk assessment area?	minimal	high	The species is included in three out of 267 site improvement plans for Natura 2000 sites in England (Natural England, 2015) as a pressure/threat (Avon River and Valley, Norfolk Valley Fens, River Itchen) indicating concerns about the species even if no details on the impacts or declines in conservation status caused by the species are described.
2.21. How important is decline in conservation status (e.g. sites of nature conservation value, WFD classification) caused by the organism likely to be in the **future** in the risk assessment area?	moderate	low	Habitats invaded and potentially invaded by *I. capensis* in the future are often of high conservation value and if *I. capensis* would invade and form more competitive stands their value could decline.
2.22. How important is it that genetic traits of the organism could be carried to other species, modifying their genetic nature and making their economic, environmental or social effects more serious?	minor	high	It has been suggested that *I. capensis* could hybridise with the native *I. noli-tangere* (Tabak & von Wettberg, 2008), however, no hybrids have been reported and the risk has been considered as low in other European countries where both species occur (Matthews et al., 2015, Adamowski et al., 2018). I. *noli-tangere* is probably native in Britain in the Lake District and Wales only (Hatcher et al., 2004), both areas where I. capensis is currently not present.
2.23. How important is social, human health or other harm (not directly included in economic and environmental categories) caused by the organism within its existing geographic range?	minimal	high	No evidence of social, human health or other harm caused by the species has been found.
2.24. How important is the impact of the organism as food, a host, a symbiont or a vector for other damaging organisms (e.g. diseases)?	minimal	high	There is no evidence of *I. capensis* facilitating any damaging organisms.

2.25. How important might other impacts not already covered by previous questions be resulting from introduction of the organism? (specify in the comment box)	NA	high	
2.26. How important are the expected impacts of the organism despite any natural control by other organisms, such as predators, parasites or pathogens that may already be present in the risk assessment area?	minor	medium	The impact of the *I. capensis* could be influenced by rust fungi (Puccinia), four of which have been associated with *I. capensis* (Tanner et al., 2008). *Puccinia recondita,* for example, has been shown to have negative impacts on the growth of *I. capensis* (Lively et al., 1995).
2.27. Indicate any parts of the risk assessment area where economic, environmental and social impacts are particularly likely to occur (provide as much detail as possible).	Lowland areas in England, Wales and southern Scotland	low	Given the low level of information about *I. capensis* it is not possible to specify any areas in which impacts are more likely to occur.

RISK SUMMARIES			
	RESPONSE	**CONFIDENCE**	**COMMENT**
Summarise Entry	very likely	very high	The species is already present.
Summarise Establishment	very likely	very high	The species is already naturalised in the risk assessment area and has been present for more than a hundred years.
Summarise Spread	slowly	medium	The species relies mainly on natural spread which makes it difficult to reach new river catchment areas where it is not already present.
Summarise Impact	minor	medium	The overall impact of the species is likely to be minor due to the possibility of further spread and the risk that denser stands with more competitive abilities could form.
Conclusion of the risk assessment	low	medium	The overall risk of for *Impatiens capensis* is considered to be low, because no impacts have been reported so far despite the species being present for a long time in the risk assessment area. However, there is a risk that further spread and increase in abundance could cause some limited environmental impacts.

Additional questions are on the following page ...

ADDITIONAL QUESTIONS - CLIMATE CHANGE			
3.1. What aspects of climate change, if any, are most likely to affect the risk assessment for this organism?	1. increasing temperatures 2. droughts 3. flooding	1. medium 2. high 3. very high	An comparative study of different *Impatiens* species at the river Rhine in western Germany found *I. capensis* better adapted to warming and drying out soils than *I. glandulifera* or the native *I. noli-tangere* in the same habitat and under experimental conditions indicating the potential higher adaptability of the species to climate change (Dericks, 2007). The same study also found *I. capensis* growing well through longer periods of flooding and in water logged soils.
3.2. What is the likely timeframe for such changes?	20 years	medium	
3.3. What aspects of the risk assessment are most likely to change as a result of climate change?	impacts	low	If competitive ability of *I. glandulifera* would be reduced, this could increase density in *I. capensis* stands resulting in higher impacts.
ADDITIONAL QUESTIONS - RESEARCH			
4.1. If there is any research that would significantly strengthen confidence in the risk assessment please summarise this here.	Impacts Climate change	high medium	Research on current impacts, in particular the growth habit of stands (density and competitive ability) would be useful to assess potential impacts on native biodiversity. Research on phenology/reproductive output under near-future warming to predict likely responses of the species to climate change

Please provide a reference list on the following page ...

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