

# Himalayan knotweed (*Persicaria wallichii*)



- Introduced to GB in 1900 from the Himalayas as an ornamental garden plant.
- Locally well established, particularly in north and west GB.
- Forms dense stands displacing native species.
- Evidence of rapid spread in some areas where it has become established.

## History in GB

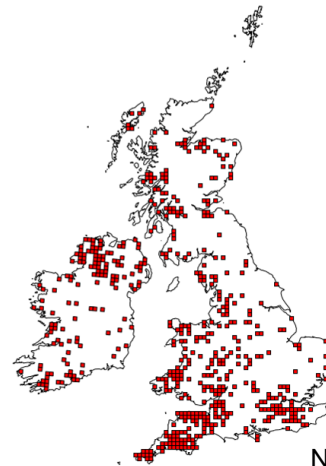
Originally introduced to Britain as an ornamental garden plant. First recorded in cultivation in Britain in 1900 and by 1917 had spread to the wild in North Devon. Usually found in abandoned gardens and areas where garden waste has been dumped, e.g. roadsides. By 1986 it had been recorded in 205 10km squares across GB, increasing to 374 by 1999 and 608 by 2010.

## Native distribution

Native to: Himalayas (China, Indian subcontinent, Afghanistan, Bhutan, Nepal, Pakistan).

(Native range map not available)

## Distribution in GB



NBN Gateway 2015

## Impacts

### Environmental

- Displaces native species by forming dense stands up to 2m tall and reducing availability of nutrients in the soil.
- Can reduce the quality of fish and wildlife habitat in riparian areas.

### Economic

- Could become costly to control if there is significant spread from established sites.

### Social

- None known

## Introduction pathways

Ornamental - originally introduced as an ornamental garden plant and still available in trade.

## Spread pathways

Natural - although little is known about the invasiveness of this species a three fold increase in known locations in two years suggests it could spread very rapidly.

Human - likely that dumped garden waste contributes to spread.

## Summary

|               | Risk                | Confidence       |
|---------------|---------------------|------------------|
| Entry         | <b>VERY LIKELY</b>  | <b>VERY HIGH</b> |
| Establishment | <b>VERY LIKELY</b>  | <b>VERY HIGH</b> |
| Spread        | <b>INTERMEDIATE</b> | <b>HIGH</b>      |
| Impacts       | <b>MAJOR</b>        | <b>MEDIUM</b>    |
| Conclusion    | <b>MEDIUM</b>       | <b>MEDIUM</b>    |

## 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](http://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](mailto:nnss@apha.gsi.gov.uk)

**Rapid Assessment of:** *Persicaria wallichii*, Himalayan Knotweed  
**Author:** Jonathan Newman

**Version:** Final (April 2016) – Draft 1 (August 2013), Peer review (October 2013), NNRAP 1<sup>st</sup> review (October 2013), Draft 2 (January 2015), NNRAP 2<sup>nd</sup> review (February 2015), Draft 3 (April 2015)

**Signed off by NNRAP:** February 2015

**Approved by Programme Board:** September 2015

**Placed on NNSS website:** November 2015

**GB Non-native species Rapid Risk Assessment (NRA)**

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

**Response:** Identified by PlantLife horizon scanning research as of critical importance for risk assessment.

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:**

*Persicaria wallichii* Greuter & Burdet, Himalayan Knotweed, Clymog yr Himalaya

Syn:

*Aconogonon polystachyum* - (Wall. ex Meisn.) Small

*Persicaria polystachya* - (Wall. ex Meisn.) H. Gross

*Pleuropteryrum polystachyum* - (Wall. ex Meisn.) Javeid & Munshi

*Polygonum polystachyum* - Wall. ex Meisn.

*Reynoutria polystachya* - (Wall. ex Meisn.) Moldenke

*Rubrivena polystachya* - (Wall. ex Meisn.) M. Král

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

**Response:** Yes, Belgium (<http://ias.biodiversity.be/species/show/85>), North west of America ([http://ucjeps.berkeley.edu/cgi-bin/get\\_IJM.pl?tid=82467](http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=82467)), Ireland (<http://www.fisheriesireland.ie/Invasive-species-list/himalayan-knotweed.html>)

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

**Response:** Recorded in 584 records (NBN Gateway accessed 19<sup>th</sup> March 2012). See distribution map under establishment section. The NBN gateway when access in January 2015 (<https://data.nbn.org.uk/Search?q=persciaria+waliichii>) showed 1,734 records of this species. An increase of 300% in two years.

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 (see comments under establishment section)

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 (see comments under establishment section)

**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 (see comments under spread section)

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

**Response:** Yes (see comments under impact section)

### **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*

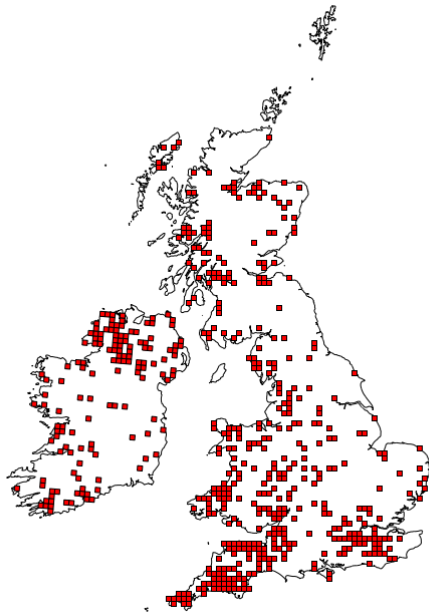
**Confidence:** *very high*

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

Already present and established. It is native to the Himalayas between Afghanistan and South West China. It was first recorded in cultivation in the RAA in 1900 and in the wild by 1917. It was introduced as an ornamental garden plant and is common on roadsides and canal towpaths. It is available for sale at 9 suppliers recommended by the RHS plant finder (<https://www.rhs.org.uk/Plants/Search-Results?form-mode=true&context=1%3Den%26q%3DPersicaria%2Bwallichii%26s1%3DplantForm&query=Persicaria%20wallichii>)

### Establishment Summary

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



**Response:** *very likely*

**Confidence:** *very high*

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

Currently present in 1734 sites (NBN gateway, <https://data.nbn.org.uk/Taxa/NBNSYS0000003765/GridMap>), but also in Ireland. Well established in stream sides, hedge banks, woodland edges, roadsides, railway banks and waste ground (Plantlife 2012, accessed 19<sup>th</sup> March 2012), where it grows into “extremely dense stands that out-compete all native vegetation”.

Himalayan knotweed grows best in unshaded areas (WSDA 2008) and seedlings may not survive in shaded areas. This species grows in moist, disturbed sites, roadsides, fields, and waste areas (Hinds and Freeman 2005, DiTomaso and Healy 2010, Klinkenberg 2012). In Poland, it has established only in anthropogenically disturbed areas (Bartoszek 2006). However, it can also

establish in areas disturbed by river action or flooding (Washington NWCB 2004).

Distribution map from NBN Gateway (accessed January 2015)

### 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):**

Little is known about the invasive behaviour of this species, and although it has tended to be restricted to riparian habitats until now, the invasiveness of closely related species (e.g *Fallopia* spp.) may indicate a propensity for rapid spread. Indeed a 300% increase in known locations in two years is an indication of very rapid spread.

Himalayan knotweed reproduces sexually by seeds and vegetatively from extensive rhizomes. However, seed production is rare and some populations appear to be sterile and the species rarely sets seed in the RAA ([http://www.brc.ac.uk/gbmn\\_admin/index.php?q=node/240](http://www.brc.ac.uk/gbmn_admin/index.php?q=node/240)). The amount of time seeds remain viable in the soil is unknown.

Seeds are dispersed by wind. Rhizome and stem fragments are dispersed in waterways or by flooding (DiTomaso and Healy 2007). It is likely that dumped garden waste contributes to the spread of this species. Himalayan knotweed is grown as an ornamental plant in gardens, and it escapes cultivation (DiTomaso and Healy 2007). The germination requirements of Himalayan knotweed are largely unknown.

Very rapid spread in Alaska has been noticed in the recent past (Nawrocki et al., 2011).

### Impact Summary

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

**Response:** *major*

**Confidence:** *medium*

**Comments (include list of impacts in your comments):**

Himalayan knotweed forms dense stands and grows up to 2 m tall Klinkenberg (2012), indicating that it can create new tall forb layers and reduce the density of or eliminate underlying layers. This species has large leaves and produces thick foliage, which outshades underlying vegetation (WSDA 2008) and displaces native species. This species can limit the establishment of trees (WSDA 2008).

Himalayan knotweed can reduce the quality of fish and wildlife habitat in riparian areas (WSDA 2008). Infestations may reduce insect populations that provide food sources to salmon (WSDA 2008).

Himalayan knotweed reduces the availability of nutrients in the soil. It competes with trees and can reduce shade along rivers and streams by displacing native, woody species. Infestations produce dense mats of leaf litter that prevent the germination of native species (Wilson 2007, Parkinson & Mangold, 2010).

### 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):**

The fragile nature of riparian habitats, with droughts, floods (predicted under climate change scenarios) and disturbed bank habitats would tend to increase spread of this species Conolly (1977) in monitoring the invasion of *P. wallichii* (*Polygonum polystachyum*) noted that the species was primarily a garden escape. She warned that patterns of invasiveness similar to that shown by *Fallopia japonica* were likely after a lag period. Parkinson & Mangold (2010) report that *P. wallichii* is common on disturbed ground and forest edges in native habitats, but tends to occur in riparian habitats in invaded locations, such as canal towpaths. The recent explosion of this species in Alaska (Nawrocki et al., 2011) provides a warning of what can happen after a relatively benign lag period.

### Conclusion

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

**Response:** *medium*

**Confidence:** *medium*

**Comments:** Little is known about the invasive behaviour of this species, and although it has tended to be restricted to riparian habitats until now, the invasiveness of closely related species (e.g *Fallopia* spp.) may indicate a propensity for rapid spread, Indeed a 300% increase in known locations in two years is an indication of very rapid spread. It tends to dominate in abandoned garden settings, where previously cultivated (disturbed) soil has been remained undisturbed for several years, indicating seed production is an effective method of colonisation within habitats (Conolly, 1977). It may have serious impacts on co-existing species due to increase leaf litter production and shading, with similar effects to *Impatiens glandulifera* on understorey species (Newman, pers. obs.)

**Management options (brief summary):**

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

**Response:**

Yes. Cutting and herbicide application (Child & Wade, 2000)

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

**Response:**

Plants can regenerate from rhizome fragments as short as 2 cm and from stem fragments (Wilson 2007). Small populations of young plants can be removed by **hand pulling or digging** as long as all rhizomes are removed from the soil (DiTomaso and Healy 2007). Regularly **repeated cutting** can eventually eliminate small populations. Plants should be cut close to the ground twice per month from April to August and once per month from August until frost for at least two or three years (WSDA 2005). Populations can be **covered** with **opaque material**. The material should extend at least 8 m beyond the boundaries of the population and must remain in place for one year or more. **Herbicide application** is often the most effective method for long-term control. Foliar applications of glyphosate, imazapyr, glyphosate-imazapyr mixtures, or triclopyr applied in spring can efficiently control large populations. Glyphosate and triclopyr should be applied at 2% concentration. The addition of 0.5% non-ionic surfactant increases herbicide uptake. Applying 25% glyphosate or triclopyr to cut stems results in high plant mortality and largely avoids killing non-target species. Plants should be cut within three nodes of their bases in summer or fall, and herbicides should be applied directly to the cut portion. **Stem injections** have also proven effective (Washington NWCB 2004, WSDA 2005). Himalayan knotweed is intolerant of saline conditions and repeated **watering with seawater** can reduce or eliminate populations near coastal areas (Cheney 2007).

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

**Response:**

Restriction of Sale  
Education in Gardening magazines.  
Any reduced advertising reduces the public awareness of such species, and this can be related to availability at points of sale and consequent garden escapes.

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

**Response:**

Quickly to restrict spread and possibly prevent explosive colonisation of suitable habitats. Chemical control is usually very rapid and may achieve eradication in 1 – 2 years.

## References

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

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