

## **‘Garden plants: a threat to the natural environment due to climate change?’ A survey for BSBI vice-county recorders**

**Introduction:** You are being invited to participate in this online survey which is part of a PhD project titled ‘**Garden plants: a threat to the natural environment due to climate change?**’ This research is being conducted by Tomos Jones, a PhD student at the University of Reading. The project is supervised by Dr Alastair Culham and Dr Brian Pickles at the University and by Dr Eleanor Webster at the Royal Horticultural Society (RHS).

**Aim:** This research will investigate the possible impacts of climate change on the distribution of garden plants (as non-native plants) and their interaction with the natural environment in Britain and Ireland. The aim of this short survey is to gather information on which garden plants are perceived to be a future threat to the natural environment in your vice-county (VC). Here are the definitions of the terms included in this survey:

*Native species:* A plant which is “present in the study area (Britain and/or Ireland) without, intervention by humans, whether intentional or unintentional, having come from an area in which it is native or one which has arisen *de novo* in the study area (Macpherson et al., 1996:14). This includes species with a changing natural range (without direct human intervention) as a consequence of climate change (Gilroy et al., 2017).

*Non-native plant (NNP):* A plant which was “brought to the study area (Britain and/or Ireland) by humans, intentionally or unintentionally, even if native in the source area” *or* one which has “come to the area without human intervention, but from an area in which it is present as a non-native (Macpherson et al., 1996:14). Synonym: alien, introduced. NNPs do not necessarily have a detrimental ecological and/or economic impact on the natural environment. These are termed ‘invasive’ (see below).

*Garden plant:* A NNP which has been introduced intentionally for horticultural purposes. It may be naturalised or not. Does not include NNPs arriving by other means such as in bird seed mixes which are often found in gardens.

*Naturalised:* A NNP (including garden plants) that has established in the natural environment with a self-reproducing population, either increasing by sexual or vegetative means (Stace and Crawley, 2015). A naturalised NNP is not necessarily invasive (see below).

*Invasive:* To have a detrimental ecological and/or economic impact.

*Control:* Efforts to mitigate the economic and/or ecological impact of a NNP, but does not necessarily mean complete eradication. This includes listing on Schedule 9 of the Wildlife and Countryside Act.

*Eradication:* The total removal of a NNP from the natural environment.

This initial survey is for BSBI VC recorders as you have good knowledge and experience of plant distribution in your VC. This survey can be completed regardless of your personal opinion on climate change as a driver for vegetation changes. The survey will inform subsequent elements of the PhD, including species' distribution modelling and a citizen science project which will give the wider BSBI membership, and the general public, an opportunity to engage with this project.

1. Are you a BSBI VC recorder?

Yes

No [If no, screen respondents to a 'thank you' message]

*If you are not the sole recorder for your VC, each recorder is encouraged to complete this survey independently.*

*'Thank you' message: If you are not a VC recorder, I am afraid you cannot complete this survey but there will be opportunities to engage with the project at a later date. If you have decided not to take part in the survey, thanks for your time.*

Participating in this survey is voluntary and there is no obligation on VC recorders to participate. You can withdraw at any time without detriment. The survey is split into Section A and Section B. Section A focuses on your attitudes towards garden plants in Britain and Ireland generally, for which the data will be completely anonymised. Section B focuses on garden plants in your VC and this data will be analysed with reference to the individual VCs (in order to analyse distribution). For that reason, although no VC recorder will be connected directly to either the results or analysis, it is not possible to guarantee complete anonymity because the name of each VC recorder is freely available on the BSBI website. You will be given the option of giving your name at the end of the survey, which would only be used for the purposes of acknowledgments in any products of the survey. The online survey will be conducted using Bristol Online Surveys (with which the University has a licence). Data will be stored securely on a password-protected University account and will not be transferred onto any personal computer/laptop. If you have any questions, please email Tomos on [mk818656@reading.ac.uk](mailto:mk818656@reading.ac.uk).

2. If you decide to take part in the survey you are acknowledging that you understand the terms of participation and that you consent to these terms. Do you want to proceed to the survey?

Yes                      No [If no, screen respondents to a 'thank you' message]

**Section A: Your attitudes towards garden plants in Britain and Ireland**

3. Your attitudes towards garden plants in Britain and Ireland.

i) Garden plants pose a direct threat to the natural environment.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

ii) Garden plants that occur outside of gardens should be controlled or (when possible) eradicated to protect the natural environment.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

iii) The presence of benign garden plants (outside of gardens) can enhance the natural environment, through the provision of environmental services.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

iv) Invasive garden plants should be controlled or (when possible) eradicated to protect the natural environment.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

v) Climate change is exacerbating the impacts of garden plants on native plant species.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

vi) Hybridisation between garden plants and native plants is a risk to the functioning of the natural environment.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

vii) Hybridisation between garden plants and native plants is a threat to native plant species.

Strongly agree     Agree     Neither agree or disagree     Disagree     Strongly disagree

3.a. If you answered 'strongly agree' or 'agree', please give an example. *Please use scientific names.*

**Section B: Garden plants in your VC**

4. For which VC are you a recorder? *If you are a BSBI recorder for more than one VC, you will be asked to complete section B for each VC separately.*

VC number

5. What year did you become the BSBI recorder for this VC?

Please list the 'top five' invasive garden plants in your VC (1 being the most invasive). *Please use scientific names.*

(1) .....

(2) .....

(3) .....

(4) .....

(5) .....

5.a. Why have you chosen these garden plants?

6. Please list the 'top five' garden plants of increasing concern in your VC (1 being the garden plant of most concern). *For this question, I am interested in garden plants which are showing signs of naturalising or invasive potential. Please use scientific names.*

(1) .....

(2) .....

(3) .....

(4) .....

(5) .....

6.a. Why have you chosen these garden plants?

7. Which habitats within your VC are most susceptible to garden plant incursions? *Please select the habitats that are present in your VC, and of those, rank which ones are most susceptible to garden plants (1 being the most susceptible). The habitat options follow the Phase 1 Habitat Classification (JNCC, 2010).*

Habitat susceptibility	1	2	3	4	5	Habitat not present
		(Not susceptible)		(Very susceptible)		
A: Woodland and scrub	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B: Grassland and marsh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C: Tall herb and fern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D: Heathland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E: Mire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F: Swamp, marginal and inundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G: Open water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
H: Coastland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I: Exposure and waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J: Miscellaneous						

(including urban and semi-urban habitats)

8. Are you a BSBI recorder for more than one VC? If yes, you will be asked to complete section B for each VC.

Yes                      No

**Section B: Garden plants in your VC (for VC recorders responsible for a second VC)**

\*\*Repeat of Q.4-8\*\*

**Section C: Conclusion**

9. Are you happy to participate in further elements of this project?

Yes                      No

10. We would like to acknowledge your help by name, when possible, in any products resulting from this survey. May we acknowledge you?

Yes                      No

10.a. Name: .....

11. If you provide an email, we will contact you when the results are available.

Email: .....

#### **Section D: Thank you**

Thank you for completing this survey. If you would like to discuss the project further, please email Tomos on [mk818656@pgr.reading.ac.uk](mailto:mk818656@pgr.reading.ac.uk)

#### **References**

Gilroy, J.J., Avery, J.D. and Lockwood, J.L., 2017. Seeking International Agreement on what it means to be “native”. *Conservation Letters*, 10(2), pp.238–247.

JNCC, 2010. *Handbook for Phase 1 habitat survey: A technique for environmental audit*. [pdf]

Joint Nature Conservation Committee. Available at: [http://jncc.defra.gov.uk/PDF/pub10\\_handbookforphase1habitatsurvey.pdf](http://jncc.defra.gov.uk/PDF/pub10_handbookforphase1habitatsurvey.pdf) [Accessed November 17th, 2017].

Macpherson, P., Dickson, J.H., Ellis, R.G., Kent, D.H. and Stace, C.A., 1996. Plant status nomenclature. *BSBI News*, 72, pp.13-16.

Stace, C.A. and Crawley, M.J., 2015. *Alien Plants*. London: William Collins.