

# Challenging the view that invasive non-native plants are not a significant threat to the floristic diversity of Great Britain

Conservation scientists and practitioners have long recognized that not all non-native species pose a threat to biodiversity, yet some ecologists still fail to grasp this message (1). The conclusions drawn by Thomas and Palmer (2) that non-native plant species are not a threat to floral diversity in Britain highlight how this lack of understanding can lead to inappropriate analyses and misleading inferences regarding the impacts of non-native species. Thomas and Palmer base their conclusions on an analysis of the Countryside Survey (CS): this valuable dataset depicts large-scale vegetation changes in common habitats, but its stratified random design does not provide a comprehensive assessment of the impacts of non-native plant species on native biodiversity.

First, CS records only about 10% of the non-native flora of Britain and so cannot be considered representative of all non-native species, having an emphasis on casual plant species, feral crops, wayside weeds, and planted trees. Second, of 1,377 established non-native plants in Britain, only 103 (6.3%) are perceived as having ecological impacts (3). However, Thomas and Palmer (2) overlook previous research highlighting that, because the CS is a broad-scale survey, it undersamples non-native plants regarded as having significant ecological impacts (4). The Wildlife and Countryside Act\* enacts legislation to manage 23 widespread terrestrial non-native plant species that represent a threat to the nation's biodiversity. Only four of these species are recorded in the CS, and they occur in few quadrats. Third, the CS records a tiny proportion of highly threatened native species requiring conservation action† and these also occur infrequently in the dataset. Thus, the CS has limited statistical power to address the likelihood of native species extinctions. Fourth, the CS does not sample sufficiently the habitats of high-conservation value for which non-native species are a major threat: for example, hybrid rhododendron (*Rhododendron* × *superponticum*) in Atlantic oakwoods, Hottentot fig (*Carpobrotus edulis*) in coastal cliff

communities, and pirri-pirri burr (*Acaena novae-zelandiae*) in sand dunes. Thomas and Palmer (2) suggest that such non-native species remain too localized to have national-scale effects, but simply because they are not widespread does not mean that they should be disregarded. Rhododendron threatens one of the few endemic plant species to Britain, the Lundy cabbage (*Coincya wrightii*), even though this native species only occurs on one small island.

Given these caveats, Thomas and Palmer's (2) unrefined exploration of an extensive stratified random sample of plant species simply documents previously reported trends (4) and further does not adequately characterize the hazards posed by non-native plants to species and ecosystems of greatest conservation concern in Britain. A major conservation goal is to understand, predict, and mitigate the biodiversity threats posed by non-native species. Research on the impacts of non-native species therefore must move away from correlative approaches and instead increasingly focus on the non-native species causing the most significant harm to threatened species and ecosystems (5). Thomas and Palmer (2) fail to contribute to this goal and if conservation bodies and governments simply take their headline provocations and apply them to the management of plant invasions, then this will be to the detriment of conservation worldwide.

**Philip E. Hulme<sup>a,1</sup>, Aníbal Pauchard<sup>b,c</sup>, Petr Pyšek<sup>d,e,f</sup>, Montserrat Vilà<sup>g</sup>, Christina Alba<sup>d</sup>, Tim M. Blackburn<sup>h</sup>, James M. Bullock<sup>i</sup>, Milan Chytrý<sup>j</sup>, Wayne Dawson<sup>k</sup>, Alison M. Dunn<sup>l</sup>, Franz Essl<sup>m</sup>, Piero Genovesi<sup>n</sup>, Lindsay C. Maskell<sup>o</sup>, Laura A. Meyerson<sup>p</sup>, Martin A. Nuñez<sup>q</sup>, Jan Pergl<sup>d</sup>, Oliver L. Pescott<sup>h,r</sup>, Michael J. O. Pocock<sup>i,r</sup>, David M. Richardson<sup>f</sup>, Helen E. Roy<sup>j,r</sup>, Simon M. Smart<sup>o</sup>, Kateřina Štajerová<sup>d,e</sup>, Thomas Stohlgren<sup>s</sup>, Mark van Kleunen<sup>k</sup>, and Marten Winter<sup>t</sup>**

<sup>a</sup>Bio-Protection Research Centre, Lincoln University, Lincoln 7647, New Zealand;

<sup>b</sup>Laboratorio de Invasiones Biológicas,

Facultad de Ciencias Forestales, Universidad de Concepción, 4070386 Concepción, Chile; <sup>c</sup>Institute of Ecology and Biodiversity, 7800024 Santiago, Chile; <sup>d</sup>Department of Invasion Ecology, Institute of Botany, The Czech Academy of Sciences, CZ-252 43 Průhonice, Czech Republic; <sup>e</sup>Department of Ecology, Faculty of Science, Charles University in Prague, CZ-128 44 Prague, Czech Republic; <sup>f</sup>Centre for Invasion Biology, Department of Botany & Zoology, Stellenbosch University, Matieland 7602, South Africa; <sup>g</sup>Department of Integrative Ecology, Estación Biológica de Doñana, Consejo Superior de Investigaciones Científicas, 41092 Seville, Spain; <sup>h</sup>Department of Genetics, Evolution, & Environment, Centre for Biodiversity & Environment Research, University College London, London WC1E 6BT, United Kingdom; <sup>i</sup>Centre for Ecology & Hydrology and <sup>r</sup>Biological Records Centre, Wallingford OX10 8BB, United Kingdom; <sup>j</sup>Department of Botany and Zoology, Masaryk University, CZ-611 37 Brno, Czech Republic; <sup>k</sup>Ecology, Department of Biology, University of Konstanz, D-78464 Konstanz, Germany; <sup>l</sup>School of Biology, University of Leeds, Leeds LS2 9JT, United Kingdom; <sup>m</sup>Division of Conservation, Vegetation, and Landscape Ecology, University of Vienna, 1030 Vienna, Austria; <sup>n</sup>Institute for Environmental Protection and Research, and Chair International Union for Conservation of Nature Species Survival Commission Invasive Species Specialist Group, 00144 Rome, Italy; <sup>o</sup>Centre for Ecology & Hydrology, Lancaster Environment Centre, Lancaster

Author contributions: P.E.H., A.P., P.P., M.V., C.A., T.M.B., J.M.B., M.C., W.D., A.M.D., F.E., P.G., L.C.M., L.A.M., M.A.N., J.P., O.L.P., M.J.O.P., D.M.R., H.E.R., S.M.S., K.S., T.S., M.v.K., and M.W. wrote the paper.

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<sup>1</sup>To whom correspondence should be addressed. Email: Philip.Hulme@lincoln.ac.nz.

\*jncc.defra.gov.uk/page-1377.

†jncc.defra.gov.uk/page-5171.

LA1 4AP, United Kingdom; <sup>P</sup>Natural Resource Sciences, University of Rhode Island, Kingston, RI 02881; <sup>Q</sup>Laboratorio Ecotono, Instituto de Investigaciones en Biodiversidad y Medio Ambiente, Consejo Nacional de Investigaciones Científicas y Técnicas, Universidad Nacional del Comahue, San Carlos de Bariloche, CP 8400, Argentina; <sup>S</sup>Natural Resource Ecology Laboratory,

Colorado State University, Fort Collins, CO 80523; and <sup>T</sup>German Centre for Integrative

Biodiversity Research (iDiv) Halle-Jena-Leipzig, 04103 Leipzig, Germany

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