

## University of Tasmania Open Access Repository

### Cover sheet

**Title**

Will pollen-mediated gene flow from industrial Eucalyptus plantations impact on the genetic integrity of native eucalypt forests in Australia?

**Author**

Barbour, R, Rene Vaillancourt, Bradley Potts

**Bibliographic citation**

Barbour, R; Vaillancourt, Rene; Potts, Bradley (2008). Will pollen-mediated gene flow from industrial Eucalyptus plantations impact on the genetic integrity of native eucalypt forests in Australia?. University Of Tasmania. Conference contribution. [https://figshare.utas.edu.au/articles/conference\\_contribution/Will\\_pollen-mediated\\_gene\\_flow\\_from\\_industrial\\_Eucalyptus\\_plantations\\_impact\\_on\\_the\\_genetic\\_integrity\\_of\\_native\\_euca](https://figshare.utas.edu.au/articles/conference_contribution/Will_pollen-mediated_gene_flow_from_industrial_Eucalyptus_plantations_impact_on_the_genetic_integrity_of_native_euca)

Is published in:

**Copyright information**

This version of work is made accessible in the repository with the permission of the copyright holder/s under the following,

**Licence.**

Rights statement: Copyright 2008 University of Tasmania

If you believe that this work infringes copyright, please email details to: [oa.repository@utas.edu.au](mailto:oa.repository@utas.edu.au)

Downloaded from University of Tasmania Open Access Repository

Please do not remove this coversheet as it contains citation and copyright information.

**University of Tasmania Open Access Repository**

Library and Cultural Collections

University of Tasmania

Private Bag 3

Hobart, TAS 7005 Australia

E [oa.repository@utas.edu.au](mailto:oa.repository@utas.edu.au)

CRICOS Provider Code 00586B | ABN 30 764 374 782

[utas.edu.au](http://utas.edu.au)

# Will pollen-mediated gene flow from industrial *Eucalyptus* plantations impact on the genetic integrity of native eucalypt forests in Australia?

Robert Barbour, René Vaillancourt and Brad Potts

School of Plant Science and CRC for Forestry, Private Bag 55, Hobart 700, Tasmania.

With the large increase in industrial eucalypt plantations in Australia over the last decade, there is growing concern that native eucalypt gene pools may be contaminated by pollen flow from locally exotic eucalypt species or provenances. We are studying the risk of hybridisation from the two most commonly planted hardwood species in industrial plantations in Australia, *Eucalyptus nitens* and *E. globulus*. While both species are native to Australia, they are frequently planted outside their natural range and in close proximity to species with which they do not co-occur naturally. While hybridisation will not occur when adjacent species belong to different subgenera to the plantation species, barriers to hybridisation within subgenera of *Eucalyptus* are frequently weak and exotic gene flow is then possible. A number of steps in the process of pollen-mediated gene flow have therefore been assessed. Firstly, field surveys across the entire temperate hardwood estate have confirmed that many compatible native eucalypts are found adjacent to plantations and that most older plantations are reproductively active. Secondly, open-pollinated seed collections have demonstrated that plantations can hybridise with some native species (most notably *E. camaldulensis* and *E. ovata*) and exotic F<sub>1</sub> hybrid seedlings involving native *E. ovata* have been identified in the wild. Thirdly, artificial pollination studies have confirmed that numerous other hybrid combinations are possible involving species from the same subgenus as *E. globulus* and *E. nitens*. Fourthly, there is evidence to suggest that flowering time asynchrony and spatial isolation are important barriers which will reduce or prevent hybridisation in many cases. Fifthly, despite evidence that first generation hybrids are often less fit than parental species, some hybrids may survive to reproduction and backcross with native species. Full assessment of the impact of such hybridisation will depend on long-term studies of hybrid fitness. Strategies to identify species most at risk of exotic gene flow have been developed and practical measures to minimise this risk have been identified.

## Key Words

Biological invasion, genetic pollution, pollen dispersal, introgression, off-site impacts, forest management