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Articles

PREDICTING THE ECONOMIC IMPACT OF AN INVASIVE SPECIES ON AN ECOSYSTEM SERVICE

David C. Cook^{1,2,4}, Matthew B. Thomas¹, Saul A. Cunningham¹, Denis L. Anderson¹, and Paul J. De Barro³

¹CSIRO Entomology, Black Mountain, GPO Box 1700, Canberra ACT2601 Australia

²School of Resources, Environment and Society, Linnaeus Way, Australian National University, Canberra ACT0200 Australia

³CSIRO Entomology, 120 Meiers Road, Indooroopilly QLD4068 Australia

Quantifying the impact of alien invasive species on ecosystem services is an essential step in developing effective practices and policy for invasive species management. Here we develop a stochastic bioeconomic model that enables the economic impact of an invasive pest to be estimated before its arrival, based on relatively poorly specified ecological and economic parameters. We developed the model by using a hypothetical invasion of the varroa bee mite (*Varroa destructor*) into Australia and the negative flow-on effects that it would have on pollination by reducing honey bee populations, giving rise to a loss of pollination services, reduced crop yields, and additional production costs. If the mite were to continue to be prevented from entering the country over the next 30 years, we estimate that the economic costs avoided would be US\$16.4–38.8 million (Aus\$21.3–50.5 million) per year. We suggest that current invasion response funding arrangements in Australia, which do not acknowledge these avoided damages, require amendment.

Keywords: [Apis mellifera](#), [Australia](#), [bioeconomic model](#), [economic impact assessment](#), [European honey bee](#), [invasive species](#), [parasitic bee mite](#), [pollination](#), [Varroa destructor](#)

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⁴ E-mail: david.c.cook@csiro.au

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