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

Received: September 28, 2006; Revised: February 9, 2007; Accepted: February 26, 2007

Cited by


JANIKE FALK-PETERSEN, CLAIRE W. ARMSTRONG. (2013) To Have One's Cake and Eat it Too: Managing the Alien Invasive Red King Crab. Marine Resource Economics 28:1, 65-81


E-mail: david.c.cook@csiro.au


http://dx.doi.org/10.1890/06-1632.1

E-mail: david.c.cook@csiro.au

Cook, David C.1,2,4, Matthew B. Thomas1, Saul A. Cunningham1, Denis L. Anderson3, 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, Indooropilly QLD4068 Australia

Received: September 28, 2006; Revised: February 9, 2007; Accepted: February 26, 2007

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

Received: September 28, 2006; Revised: February 9, 2007; Accepted: February 26, 2007

E-mail: david.c.cook@csiro.au
Online publication date: 1-Oct-2012.
CrossRef

Online publication date: 1-Aug-2012.
CrossRef

Online publication date: 1-May-2012.
CrossRef

Online publication date: 1-Jan-2012.
CrossRef

Eleanor J. Blitzer, Carsten F. Dormann, Andrea Holzschuh, Alexandra-Maria Klein, Tatyana A. Rand, Teja Tschamntke. (2012) Spillover of functionally important organisms between managed and natural habitats. Agriculture, Ecosystems & Environment 166:1, 34-43
Online publication date: 1-Jan-2012.
CrossRef

Tracy M. Rout, Joslin L. Moore, Hugh P. Possingham, Michael A. McCarthy. (2011) Allocating biosecurity resources between preventing, detecting, and eradicating island invasions. Ecological Economics
Online publication date: 1-Oct-2011.
CrossRef

Online publication date: 1-Oct-2011.
CrossRef

Online publication date: 1-Sep-2011.
CrossRef

Online publication date: 1-Sep-2011.
CrossRef

Michael B. Ashcroft, John R. Gollan, Michael Batley. (2011) Combining citizen science, bioclimatic envelope models and observed habitat preferences to determine the distribution of an inconspicuous, recently detected introduced bee (Halictus maragdulus Vachal Hymenoptera: Halictidae) in Australia. Biological Invasions
Online publication date: 26-Aug-2011.
CrossRef

Online publication date: 9-Aug-2011.
CrossRef

Online publication date: 1-Jun-2011.
CrossRef

Online publication date: 3-May-2011.
CrossRef

David Clifford, Simon Barry, David Cook, Rob Duthie, Denis Anderson. (2011) Using Simulation to Evaluate Time to Detect Incursions in Honeybee Biosecurity in Australia. Risk Analysis-no
Online publication date: 1-Mar-2011.
CrossRef

Online publication date: 1-Jan-2011.
CrossRef

CrossRef

Online publication date: 1-Jul-2010.
CrossRef

Online publication date: 1-Jun-2010.
CrossRef

Online publication date: 1-Apr-2010.
CrossRef

Online publication date: 15-Mar-2010.
CrossRef

Online publication date: 15-Feb-2010.
CrossRef

http://www.esajournals.org/doi/abs/10.1890/06-1632.1


