

Economic consequences of biological invasions: the impacts of invasive species threats on Queensland's bioregional attributes

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Abstract

This study aims to provide an estimate of non-consumptive use and non-use values for controlling invasive pest species in Queensland's bioregions. Bioregions are geologically and ecologically distinct land areas. Bioregion specific values are estimated to assist the development of landscape specific biosecurity management plans that are consistent with the interim Biogeographic Regionalisation for Australia (IBRA) framework. Six out of 13 bioregions of Queensland, namely Cape York Peninsula, Wet Tropics, Bringalow Belt North, Central Queensland Coast, Southeast Queensland, Gulf Plain bioregion, were selected for this study. A public survey was conducted in January 2011 where about 600 households living in these six bioregions were interviewed using the choice experiment (CE) technique of non-market valuation. Three bioregional attributes were included in the CE study: (1) native plant and animal species, (2) landscape and water bodies and (3) backyard and outdoor recreation areas. Respondents were asked for their willingness to pay for enhanced biosecurity measures that aim to (1) save native plant and animal species from the threat posed by invasive species, (2) reduce the percentage of landscape and water bodies covered by invasive weeds and (3) reduce the chance of invasive ants and other biting insects being established in the backyard and outdoor recreation areas.

Our results show that the sampled households have positive willingness to pay for the three bioregional attributes included in the choice experiment. The average implicit price to save native plant and animal species varied between A\$22 and A\$34. Average willingness to pay to eliminate weed cover from landscape and water bodies was A\$7. Household willingness to pay to reduce the chances of ants and other biting insects ranged from A\$232 to A\$93. The standard Poe et al. (1994) test was employed to examine if the differences between the implicit prices obtained from all of Queensland sample and bioregion specific samples are statistically significant. The test results fail to provide sufficient evidence to reject the null hypothesis of equality between implicit prices. Compensating surplus welfare measures were estimated for three alternative biosecurity policies. The measures were obtained by subtracting indirect utility of the status quo from indirect utility to be obtained from a changed policy measure. On average, sampled households were willing to bear between A\$100 to A\$235 per year to support changes to the existing biosecurity measures. This is about 0.15 to 0.35 percent of the average yearly income of the sampled households. This result suggests that enhanced biosecurity measure is likely to improve household welfare by better protecting the bioregional attributes.