Non Market Value of Biodiversity on Agricultural Land by Rural Landowners: A Case Study

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ABSTRACT

The loss of biodiversity on agricultural land is of increasing concern, both in New Zealand and globally. In New Zealand, historically, that loss is largely a result of the clearing of lowland forests and the draining of wetlands for increased agricultural production. Biodiversity is a critical component of our natural environment and necessary for sustainable development, particularly for the ecosystem services (such as, soil stability, nutrient retention, and flood protection) it provides. However, it has too long been under-valued.

The aim of this research is to use a stated preference approach, choice modelling, to determine the non-market value rural landowners place on biodiversity on agricultural land. It employs different attributes for biodiversity, and a payment vehicle of an annual contribution, for a 10-year period, into a council designated fund to which farmers can apply for funding to take actions to enhance indigenous biodiversity on their land. The focus of this study is the Waikato Region, due to its diversity of native flora and fauna and the pressures placed on it from the region's strong agriculture based economy. An online survey was used to survey rural landowners in the region. Usable responses were obtained from 146 respondents, three-quarters of whom operate their own farm and two-thirds of whom have indigenous biodiversity present on their farm.

A latent class model was used to estimate non-market values, since revealed attribute non-attendance (or avoidance) had taken place. The results highlight the importance to farmers of ecosystem services provided by indigenous biodiversity, as those attending to all attributes were willing

to pay toward maintaining current actions ($43.90/year for 10 years) or, for increasing actions to enhance ecosystem services ($59.65/year for 10 years). In contrast, however, they were willing to accept an annual payment ($49.22/year for 10 years) toward controlling possums and other pests. Other results were not clear-cut, making recommendations difficult. Perhaps a future study could investigate whether society as a whole places value on indigenous biodiversity being present on agricultural land, and whether there is a willingness, by society, to pay for this.

Keywords: choice modelling, biodiversity, non-market valuation, agriculture, latent class model, Waikato region, attribute non-attendance.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criterion
ANA	Attribute Non Attendance
AVC	Asymptotic Variance-Covariance
CE	Choice Experiment
BIC	Bayesian Information Criterion
CM	Choice Modelling
CVM	Contingent Valuation Method
DV	Direct Value
ECLCM	Equality Constrained Latent Class Model
HPM	Hedonic Pricing Method
IIA	Independent Irrelevant Alternatives
IID	Independent and Identically Distributed
IV	Indirect Value
LCM	Latent Class Model
NZLT	New Zealand Landcare Trust
PV	Passive Value
RPS	Waikato Regional Policy Statement
TEV	Total Economic Value
TCM	Travel Cost Method
WRC	Waikato Regional Council
WTA	Willingness to Accept
WTP	Willingness to Pay