

Valuing inland blue space: A contingent valuation study of two large freshwater lochs (lakes)

Craig McDougall ^a, Nick Hanley ^b, Richard Quilliam ^a, Katherine Needham ^b, David Oliver ^a

^a Biological & Environmental Sciences, Faculty of Natural Sciences, University of Stirling

^b Institute of Biodiversity Animal Health and Comparative Medicine, University of Glasgow

Email: c.w.mcdougall@stir.ac.uk Twitter: @CraigMcDougall_

www.hydrationscholars.scot



Introduction

Water bodies or “blue spaces” offer a range of ecosystem services, including direct health and well-being benefits

Many of these benefits occur in waterside spaces and do not require direct water contact (e.g. stress relief from viewing water)

Quantifying the economic value of freshwater ecosystem services has become an important priority for policy makers since the introduction of the European Union's Water Framework Directive

Economic analysis predominantly focuses on improving water quality and changes to waterside space are often overlooked

The **Contingent Valuation (CV)** method estimates the economic value of non-market goods, such as water quality by measuring people's **Willingness to Pay (WTP)** for the good in question

Methods

A **CV survey** (n=1108) was used to determine the value of protecting lochside quality at Loch Lomond and Loch Leven

Payment cards (Table 1) were used to gauge respondent's annual WTP to avoid deterioration of lochside quality in terms of view loss, path quality and lochside access

Deterioration in lochside quality was conveyed via a hypothetical lochside management plan and landscape visualisations (Fig.1)

Interval regression models were developed to determine factors influencing WTP

Payment amount	Yes	Unsure	No
50p			
£1			
£2			
£3			
£5			
£10			
£15			
£20			
£30			
£40			
£60			
£80			
£100			
£120			

Table 1: Completed payment ladder used to gauge WTP

■ Respondent choice

Results

Both the Loch Lomond and Loch Leven subsamples were representative of the Scottish population in terms of age, income and gender

76% were WTP for Loch Lomond and 65% were WTP for Loch Leven

Mean WTP was £12.06 for protecting lochside quality at Loch Lomond and £8.44 at Loch Leven (Fig. 2)

Household income was a significant driver of WTP for both sites (Table 2)

Users of Loch Leven were WTP more than non-users. This was not the case for Loch Lomond

WTP decreased as household distance from Loch Lomond increased

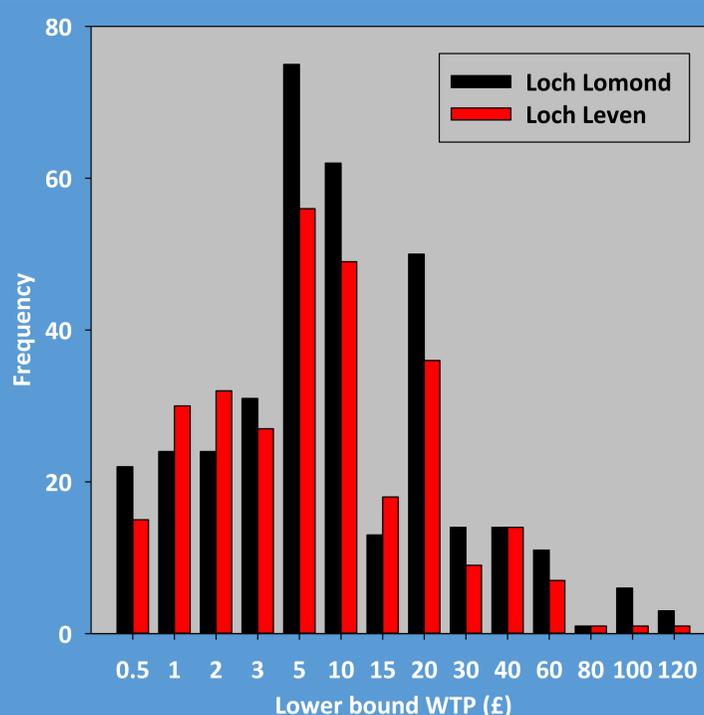


Fig. 2: Highest value that respondent would definitely be willing to pay

Variable	Lomond		Leven	
INCOME	0.31***	(0.06)	0.11***	(0.04)
ENVGROUP	2.85	(3.79)	6.33**	(2.66)
DISTANCE	-2.50**	(1.21)	-0.98	(0.99)
USER	-4.71*	(2.59)	3.93**	(1.97)
DURATION	0.03***	(0.01)	0.03***	(0.01)
POLICY_CON	2.01	(2.53)	7.74***	(1.85)
PAY_CON	4.34*	(2.56)	3.88**	(1.86)
TOURISM	-2.93	(3.45)	6.06**	(2.59)
IDENTITY	8.94*	(3.50)	-0.06	(2.65)
Predicted WTP	18.72	(0.42)	12.76	(0.38)
Constant	10.95	(5.85)	-0.36	(4.61)
Observations	485		471	
AIC	2683.86		2722.48	
BIC	2729.84		2768.19	
Log likelihood	-1330.93		-1350.24	

Table 2: Interval regression: Determinants of WTP

*** p < 0.01, ** p < 0.05, * p < 0.1.

Landscape Visualisation



Fig. 1: Loch Lomond view loss visualisation. Unmanaged = deteriorated lochside quality

Conclusions and future work

Relative to improving water quality, changes to lochside quality have important non-market economic impacts

Based on Scotland's 2.45 million households, the aggregate value per year of protecting lochside quality at Loch Lomond is £29,547,000 and £20,678,000 at Loch Leven

Economic analysis that focuses solely on water quality and excludes changes to waterside space may lead to suboptimal water resource management policies

Qualitative research may be useful for understanding why lochside quality is highly valued among non-users