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ANALYSIS

The impact of the bird flu on public willingness to pay for the protection of migratory birds

Roy Brouwer, Pieter van Beukering, Elena Sultanian*

Institute for Environmental Studies, Vrije Universiteit, De Boelelaan 1087, 1081 HV, Amsterdam, The Netherlands

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ABSTRACT

In this paper, we present the results of a unique time series analysis of contingent values and models for migratory bird protection based on an identical contingent valuation (CV) survey carried out over a three year time period since the first bird flu outbreak in 2003. Although there exists no scientific evidence for a direct relationship, migratory birds are believed to play an important role in spreading the bird flu virus worldwide. The time series analysis allows us to test the temporal stability of stated preferences for migratory bird protection and at the same time examine indirectly the possible impact of increased media attention and public awareness levels regarding the bird flu. We test the impact of the bird flu on public willingness to pay (WTP) for migratory bird protection in the final 2005 survey whilst accounting for procedural variance introduced by sequencing and question ordering-effects, but we are unable to demonstrate a direct negative relationship. A novelty of the study presented here is that respondents in the CV surveys are given the opportunity to pay an annual money amount or a one-time-off lump-sum. Annual WTP values appear to be significantly higher than one-time-off WTP values, suggesting a negative implicit discount rate. Self-selection bias is an important reason for the observed differences. We find that respondents who agree to pay annually differ significantly from respondents who wish to pay a lump-sum in terms of their underlying preferences and motivations towards migratory bird protection.

1. Introduction

Bird populations of many long-distance migrants are declining at alarming rates (BirdLife International, 2004). The reasons for declining populations of migratory birds are complex and not well understood. In general, the loss and overexploitation of habitats are considered as the most important reason for the observed decline. In the past two decades, efforts to protect birds and their habitats across Europe have resulted in a recovery of some of the threatened migratory birds, such as geese, spoonbill, stork and purple heron. For other migratory birds, such as ruff, black-tailed godwit, blue-headed wagtail and cuckoo the situation has worsened (BirdLife International, 2004).

Additional measures are required to enable an effective protection of these species. The use of economic instruments and market mechanisms has been proposed as an effective way for biodiversity protection in general (OECD, 2004) and to deal with the deterioration of migratory bird populations more particularly (Sultanian, 2005). The introduction of market-based instruments for the protection of biodiversity reflects a shift in public policy over the past decades towards a more economic approach in which both costs and benefits of biodiversity protection are taken into account (OECD, 2004).

* *Corresponding author*. Tel.: +31 20 5985608.
E-mail address: roy.brouwer@ivm.vu.nl (R. Brouwer).

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In this paper, we assess the public benefits associated with migratory bird protection by asking people for their willingness to pay (WTP) in a simulated economic market for a migratory bird protection program in the Netherlands following the contingent valuation (CV) method. About 300 to 500 million birds migrate every year to and from the Netherlands (LWVT-SOVON, 2002). We test the temporal stability and reliability of estimated contingent values and models for migratory bird protection over a period of three years, based on an identical CV survey carried out in the years 2003, 2004 and 2005. The time series analysis allows us to test the temporal stability of stated WTP for migratory bird protection and test the possible effect of increased media exposure and public information levels regarding the bird flu over this period of time. For this purpose, a number of additional questions were included in the 2005 CV survey to assess the extent to which public knowledge of and concern about the bird flu affects stated WTP for the migratory bird protection program. Since the first outbreak of the highly contagious bird flu (Avian Influenza A (H5N1) virus) in Asia and Europe (WHO, 2005), migratory birds are in the news in a negative way. Migratory birds are considered important carriers of the bird flu and therefore perceived as dangerous. In different European countries, including the Netherlands, the role of migratory birds in spreading the virus is studied. Additional measures have been imposed to protect domestic birds and poultry from exposure to migratory birds by screening them off and keeping them inside (European Commission COM(2005) 171 final).

Besides analyzing the temporal stability and the impact of the bird flu on stated preferences, a number of other methodological tests are carried out in our study, focusing on differences between annual and one-time-off donations for migratory bird protection (the limited amount of CV literature in the domain of bird protection suggests such a difference), anchoring of stated WTP on current contribution levels to environmental and nature protection organizations (such a test is absent in the existing bird valuation literature), sequencing and ordering effects of the inclusion of questions about current levels of donations and the bird flu before and after the WTP question (such tests are absent in the existing bird valuation literature).

The remainder of this paper is organized as follows. The next section provides a brief overview of the existing migratory bird valuation literature. Section 3 presents the general survey design, including the sampling procedure and the sample population characteristics, and the methodological issues addressed in this study. Section 4 discusses the test results and Section 5 presents the estimated CV model for migratory bird protection. Finally, Section 6 concludes.

2. Economic valuation of migratory birds

The application of the CV method to migratory bird protection is limited. The study presented here is one of the very few studies on this specific issue so far. The time series analysis presented in this paper is unique. The first study that looked specifically at WTP for migratory birds (Hammack and Brown, 1974) examined the marginal value attached to waterfowl by US Pacific Flyway hunters through a mail survey. Marginal values for shooting one additional waterfowl per day varied between US$ 2.4 and US$ 3.4 (price level 1968). Boyle et al. (1994) elicited US household WTP for the protection of six species of migratory waterfowl (mallard ducks, pintail ducks, white-fronted geese, snow geese, and greater sandhill cranes). Contrary to theoretical expectations, they found that respondent's average WTP for a policy to protect 2000 migratory birds from dying from oil spills (US$ 80) is as large as that to prevent 20,000 (US$ 78) or 200,000 birds from dying (US$ 88) (price level 1993). This insensitivity of WTP values to the magnitude of the proposed level of protection, referred to as '(in)sensitivity to scope', and the absence of decreasing marginal WTP for additional protection evoked a lot of discussion (e.g. Arrow et al., 1993) and resulted in many new CV studies (in other areas than bird protection) and re-examination of existing CV studies (e.g. Smith and Osborne, 1996; Carson, 1997).

A limited number of CV studies exist where specific bird species are valued in economic terms through CV. Rubin et al. (1991) and Hagen et al. (1992) investigated US households' WTP for the protection of the endangered northern spotted owl and its habitat, finding economic preservation values ranging between US$ 35 (price level 1987) and US$ 144 (price level 1992) per household per year. In a meta-analysis of threatened and endangered species including four bird species, Loomis and White (1996) find economic WTP values for the Mexican spotted owl, whooping crane, redcockaded woodpecker and bald eagle ranging between US$13 (redcockaded woodpecker) and US$70 (Mexican spotted owl) (price level 1995). Contrary to the results found by Boyle et al. (1994), Loomis and White (1996) show that WTP for rare and endangered species is sensitive to the magnitude of the proposed change. Finally, average WTP found in two CV studies carried out in Scotland looking at the conservation of internationally rare breeding birds and wild gees (Hanley and Craig, 1991; MacMillan et al., 2004) range between US$ 14 and US$ 36 (price level 2004).

3. Survey design

3.1. *Questionnaire design*

The survey questionnaire consists of four interrelated sections, including nineteen mainly closed-ended questions. The first section refers to questions about respondents' general environmental attitudes and behaviour (e.g. environmental awareness, perception of environmental issues, membership of environmental protection organizations and monetary donations). The second section asks respondents about their familiarity and information level regarding migratory birds in the Netherlands and threats to migratory bird populations (e.g. familiarity with 10 different migratory bird species measured on a Likert scale). Section three introduces the migratory bird protection scheme and the WTP questions (including reasons why respondents are or why they are not willing to pay). Additional information, including pictures, is provided about the ten birds mentioned before and it is emphasized that some of them, such as the ruff, the yellow wagtail and the purple heron, are endangered species. Missing from our study are tests of sensitivity to scope by varying bird protection levels.

First respondents are asked whether or not they are willing to pay at all and offered the opportunity to pay monthly,