Ecological Economics 146 (2018) 397–407

Contents lists available at ScienceDirect

Ecological Economics

journal homepage: www.elsevier.com/locate/ecolecon

Analysis

Exploring a Gap between Australia and Japan in the Economic Valuation of Whale Conservation

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ABSTRACT

Wildlife conservation is an important part of environmental policy; in the case of whales, we must consider the balance between two uses: whaling and whale watching. This study provides an economic valuation of whale conservation using stated-preference choice experiment data collected from anti-whaling populations in Australia and Japan. Using a mixed logit model, we find higher economic valuation for a ban on whaling than for conventional protection actions in Australia. Despite the popularity of whale watching, limiting protections for species that are observed during whale-watching tours do not necessarily increase valuation. In contrast, we do not find a policy favored among the anti-whaling Japanese, who are in the minority and are significantly different from the general population in socio-demographic terms. Nonetheless, protection focusing on endangered whales is utility increasing for both countries. Overall, the results show a significant difference even among the anti-whaling populations of the two countries, suggesting a high bar for reaching international consensus over whaling. Lastly, the results from a latent class model also suggest that the level of demand for whale conservation in Japan could match the Australian level by proclaiming the importance of conserving endangered species and providing information on whales.

1. Introduction

Biodiversity is an important element of various aspects of human life, including securing food, improving human health, providing a dynamic environment, and stimulating economic development by promoting diverse industries. However, the rapid deterioration of biodiversity has escalated in recent years, and biodiversity conservation has become increasingly important in public policy. The International Union for Conservation of Nature (IUCN) has assessed almost eighty thousand species, > 20% of which have been classified as threatened, according to the IUCN Red List criteria (IUCN, 2016). There have been global efforts to resolve the issue of declining biodiversity, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) was recently established both to provide policy makers with scientific knowledge and to evaluate the current status of biodiversity and related ecosystem services. Although there have been improvements in biodiversity protection, there are barriers to further progress because of conflicts that often arise among and within industries and countries with different environmental and economic interests and preferences.

Whale conservation is receiving increased attention because many populations of whale species are categorized as endangered (IUCN, 2014). Although the demand for environmental protection, particularly for endangered species, and the conservation of biodiversity has continued to grow, disagreement over whale conservation has developed into a relatively serious international conflict. In 1982, the International Whaling Commission (IWC) issued a moratorium on commercial whaling. However, some IWC members, including Japan, Iceland and Norway, have continued to engage in whaling; Japan claims that its whaling is conducted for the purposes of scientific research, and Iceland and Norway engage in legal whaling while exercising either reservation or objection to the moratorium. These whaling countries contributed to the hunting of more than eight hundred whales in 2013 (IWC, 2013). The increased tension related to whale protection can be partially attributed to the rise of the whale-watching industry and related tourism activities and the recent deterioration of the whaling industry caused by declining demand for whale oil and meats (Bailey, 2012; Cisneros-Montemayor et al., 2010).

Since the stances and decisions of countries should be closely related to their people's preferences, developing preservation strategies

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https://doi.org/10.1016/j.ecolecon.2017.12.002
Received 6 October 2016; Received in revised form 16 October 2017; Accepted 1 December 2017
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requires an understanding of how the issues are perceived. There is a rich literature on the economic valuation of biodiversity loss. These studies rely on the stated preference method because the total economic value of many important species involves both non-use and non-consumptive components. Researchers have studied various target species using survey data that focus on specific species, particularly those that are threatened and endangered (Bandara and Tisdell, 2004; Bulte and van Kooten, 1999; Eagle and Betters, 1998; Johnston et al., 2015; Kotchen and Reiling, 2000; Lew et al., 2010; Richardson and Loomis, 2009; Wallmo and Lew, 2016, 2011). However, valuation studies of marine systems and marine species are relatively limited compared to the research on terrestrial systems (Lindhjem and Tuan, 2011; Ressurreição et al., 2011; Richardson and Loomis, 2009).

In the relatively limited studies on the evaluation of marine mammals, researchers have often compared the valuations of different target species or the values of the same species among different population samples. Hageman (1985) conducted one of the earliest valuation studies of marine mammals, using survey data collected from California households in 1984 to compare the economic value of conserving various species, including the bottlenose dolphin, northern elephant seal, gray-blue whale, and sea otter. The study found that gray-blue whales had the highest valuation. Similarly, Samples and Hollyer (1989) used household data collected in Hawaii and found that valuation of the humpback whale was higher than that of the monk seal. Loomis and Larson (1994) found that if the target species are held constant, visitors value whales more than residents do; in addition, respondents valued a positive change in whale stocks of 100% more than a 50% change, although the marginal value decreases with an increase in whale stocks. Whereas previous studies have focused on differences in valuations between specific species of whales and other marine mammals (e.g., species of dolphins and seals), no study has compared preferences regarding preservation strategies (Brown et al., 1996; Bulte and van Kooten, 1999; Hageman, 1985; Hageman, 1986; Loomis and Larson, 1994; Samples et al., 1986; Samples and Hollyer, 1989; Wilson and Tisdell, 2003).

More recent literature on valuation has used a choice experiment format (Johnston et al., 2015; Lew, 2015; Lew et al., 2010; Wallmo and Lew, 2016, 2011). Choice experiments mitigate the response bias caused by “yea-saying”, which is different from the traditional stated preference method (Brown et al., 1996; Ready et al., 1996; Wallmo and Lew, 2011). This format also enables researchers to simultaneously examine the different attributes of a good in a single study. For example, Wallmo and Lew (2016, 2011) calculated three estimates of willingness to pay (WTP) to protect different species in a survey and found a spatial variation in values of protecting various threatened and endangered marine species (Wallmo and Lew, 2016). A review study by Lew (2015) suggested that an original survey should be designed to calculate the WTP estimate that closely reflects the environment of a possible future policy.

In this study, we depart from standard stated preference literature by not only measuring how much people are willing to pay to protect a specific target species—i.e., whales—but also identifying favorable attributes of conservation policy. These attributes are presented as a combination of the means of protection and the characteristics of whales that may affect people's incentive to support conservation. We use original survey data collected in Australia and Japan of anti-whaling populations in both countries. This sampling enables a unique international comparison of policy evaluation by whale conservationists in two countries with contrasting official stances on whaling at a national level.

We estimate WTP for whale conservation strategies with various policy attributes using data from a stated preference choice experiment (SPCE). The SPCE allows us to estimate the marginal value of policies with different attributes, which in turn enables us to determine the policy attributes that generate the greatest value among a particular sample. We use a mixed logit model that accounts for preference heterogeneity. The results reflect positive marginal utility for policy choices that increase protection for whales in the sample pools of both countries. In addition, we use a latent class model to analyze the sources of preference heterogeneity in the valuation of whale conservation. The samples from both Australia and Japan are divided into the categories of relatively higher WTP and lower or negative WTP. Furthermore, we use a logit/multinomial logit model to analyze the impact of various demographic characteristics and environmental attitudes on the likelihood of a respondent belonging to a particular category.

The general sentiment regarding whaling in Australia and Japan is deeply divided; most Japanese support whaling, whereas Australia is attempting to halt whaling and strengthen whale conservation (Wakamatsu et al., 2017). As a result, Australia, as an anti-whaling country, recently questioned whether Japan's whaling activity in the Antarctic qualifies as “scientific research” in the International Court of Justice (ICJ). Although the court ruled against Japan's whaling program in 2014, Japan resumed whaling with a new program after a temporary suspension following the judgment. The dispute over whether Japanese research whaling is “scientific” has continued outside of the court, particularly in publications (Brierley and Clapham, 2016; Clapham, 2015; Morishita, 2016). Past proposals, including a market quota on whaling (Clark and Lamberson, 1982; Costello et al., 2012; Gerber et al., 2014; Iliff, 2010), failed to resolve the dispute over whaling, which is often characterized as deadlocked (Costello et al., 2012; Mazzanti, 2001). Moreover, there is no consensus among scientists on whether the market provides incentives to conserve whales (Simmonds and Fisher, 2012; Smith et al., 2014; Veríssimo and Metcalfe, 2012).

Our empirical evidence indicates that overall, anti-whaling Australian respondents have a higher WTP for additional protection policies than do the anti-whaling Japanese respondents. The gap in the valuations, even among the anti-whaling populations in the two countries, suggests the difficulty of achieving international consensus about whale conservation. However, we also find that there is a small but potentially growing number of Japanese who are willing to pay as much as the Australians to terminate whaling. Moreover, regardless of country, people with environmentally friendly attitudes and more knowledge about whales tend to have a higher likelihood of belonging to the category that places a higher value on additional protection.

The remainder of this paper is organized as follows. Section 2 provides the details of the survey data and estimation methods. Section 3 presents the empirical results of the WTP estimates and attributes that affect preference heterogeneity. Section 4 discusses policy implications and concludes.

2. Materials and Methods

We conducted nationwide, Web-based surveys in Australia and Japan in February 2016.[1] For consistency, the questionnaires and Web tools were developed simultaneously in English for Australia and in Japanese for Japan and were essentially identical.[2] The respondents were pre-screened based on gender, age, and residential region[3] to produce representative samples of each country's general population. Additionally, to improve data quality, observations with irregular response times were eliminated.[4] The final sample contained 2254 Australian and 5100 Japanese respondents. For our analysis, we restricted

[1] A third-party contractor, Nikkei Research, administered the surveys in both countries using its extensive panel and that of its Australian partner.

[2] The only difference was in the definitions of the status quo in the choice experiment; these explanations were to continue with the ongoing effort to protect blue whales in Australia and to continue with no protective action in Japan.

[3] The criteria regarding residence applied only to the Japanese survey sample.

[4] An observation was removed if the respondent completed the survey by spending 30% less time than the average of all of the respondents whose completion times fell between the 10th and 90th percentiles of the full sample distribution.

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