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Recovery of Threatened and Endangered Marine Species

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Abstract

The existence of some degree of regional heterogeneity in willingness-to-pay estimates for environmental goods is commonly acknowledged. The benefit stream from policies impacting threatened and endangered species may differ locally, regionally, or among particular population segments, making spatial variation in threatened and endangered species values vital to analyse in a policy setting. In this study, we report WTP estimates based on a choice experiment with stated preferences for eight different marine species that are threatened or endangered. WTP is calculated at two different spatial scales using a spatially embedded sample of nine U.S. Census areas and a random sample of more than 5000 U.S. households. We compare species values between regions and between each region and the entire United States statistically to see if there are any differences. Our findings just three of the eight species exhibit differences, and there is little spatial variation between national values and values computed from regionally embedded samples. There is more variety between regions, and all species show a substantial difference in at least one comparison between regions. Our findings should be of great importance to the marine management community given that policy analyses involving vulnerable and endangered marine species might frequently be regional in scope or may disparately influence different regions.

Keywords: Heterogeneity; Marine; Community; Species; Knowledge

Introduction

The only way to determine non-consumptive use and non-use economic values for public goods like threatened, endangered, or At-Risk (TER) species is currently through the use of stated preference techniques like contingent valuation and stated preference choice experiments. Non-consumptive use value for these animals relates to the financial gains people might make from seeing, photographing, or studying the species in the wild. The advantage people may receive from a species even if they never see or interact with it is referred to as non-use value engage with it. Some examples of species-related non-use values include the advantages of protecting the species for present and future generations, as well as the advantages of just knowing that the species exists. For the sake of clarity, we refer to economic benefit measures that account for both non-consumptive use and non-use as "non-consumptive values" throughout this work. Agencies tasked with assessing the costs and benefits of regulatory activities might utilise these benefit indicators in analytical and policy contexts. Non-consumptive values, for instance, may be used in the U.S. to identify important habitat for species listed under the Endangered Species Act (ESA) and to assess species recovery efforts. In Canada, it is possible to employ non-consumptive values to determine the government must "examine regulatory and non-regulatory options to maximise net benefits to society as a whole" in order to classify a species under the Species at Risk Act, the Canadian version of the U.S. ESA. In addition to the analyses of In cases involving the assessment of natural resource damage and in achieving the goals of management paradigms like ecosystem-based management, which mandates the assessment of the full range of ecosystem impacts when considering alternative policies, species listings and non-consumptive values can be used [1].

In their analysis of economic efficiency under modelling scenarios that take into account the financial advantages of the endangered Steller sea lions' recovery, Sanchiric provide a clear illustration of the significance of this. Economic benefit information associated with TER marine species has been emphasised as a frequently missing but crucial piece of information with respect to ecosystem management, despite the fact that non-market valuation research related to environmental amenities, including studies focused specifically on TER species, has grown significantly over the past 20 years. Most studies have emphasised large or charismatic species like whales, seals, sea lions, and sea turtles when calculating the economic benefits of promoting, protecting, or preserving TER marine species. Salmonid species that are well-known or prominently featured are included in many studies, but there are few estimates for less well-known marine animals or marine plants. While very thorough of the existing research at the time, one of three species valuation meta-analyses that include a summary of some of these studies omits values from several more recent studies on TER marine species. For TER species, non-consumptive values are typically represented [2, 3].

Regarding willingness-to-pay for a certain level of improvement, in the population of the species or to stop extinction. The TER WTP for upgrading the Beluga whale's status can reach up to $ 256 for marine species, with estimates for the majority of marine species ranging between $ 10 and $ 1001. Although potentially informative, it is often impossible to compare WTP values across research to determine whether one species is more economically valuable than another because of the differences across investigations. Even within a single study, respondent heterogeneity or regional variation may affect the WTP for a single species. The second is geographical context is depicted in Giraud and Valcic. In order to calculate WTP for recovering the embedded samples, threatened Steller depending on whether the spatial sampling scale was local, state, or national, their findings revealed a significant variance in WTP. Everyone agrees that WTP computed using expressed preference methodologies frequently exhibits spatial heterogeneity. Despite the fact that spatial variation has been addressed

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in a variety of ways, the majority of research relies on the assumption of distance decay, according to which WTP for an environmental good decrease as the distance between the person and the good rises. There is evidence of a distance decay effect for goods like national parks and ecosystem conservation, according to earlier studies. Significant improvements to river water quality, albeit many of these are driven by use values. When examined on a national level, other studies looking at Great Barrier Reef non-use values have found no proof of distance degradation [4-6].

There is no reason to anticipate a distance decay effect, according to some authors, for things like TER species values where non-use values are anticipated to predominate. Loomis studied WTP for protecting the Mexican spotted owl and 62 other threatened and endangered species found close to the U.S. states of Arizona, Colorado, Utah, and New Mexico in an explicit test for a distance decay effect in TER species values. He discovered that home WTP is quite low beyond 1500 kilometres of the spotted owl range for residences located up to 2500 kilometres distant WTP for the 62 other species' protection accounted for around 40% of local household values. WTP for the California spotted owl were significant in the same investigation at a distance of 1000 miles from the species habitat. The relationship between WTP hot/cold spots and WTP patchiness has also been studied in relation to spatial variation for TER species. Hot spot analysis, in its most basic form, identifies geographical clusters of high and low values by separating regions of high and low density for a particular occurrence. To establish whether the geographic clustering pattern is statistically different from one resulting from random chance, differences between hot (cold) clusters and the surrounding values are investigated [7].

Discussion

Different spatial scales might be used to conduct the analysis. The number of cold places for the Upper Willamette River Chinook salmon and the Puget Sound Chinook salmon varied from zero at small sizes to over 80 at a large one, according to the only study conducted to date on hot/cold regions for TER marine species. a distance of 1170 kilometres. The hotspots for salmon and six other TER marine species follow a similar trend, according to the scientists. Notably, none of the TER marine species included in the study show any signs of distance deterioration in values. A distance of 1170 kilometres. The hotspots for salmon and six other TER marine species follow a similar trend, according to the scientists. Notably, none of the TER marine species included in the study show any signs of distance deterioration in values. Using geographically embedded samples is a third framework for investigating spatial variation [8]. Two studies have looked at WTP for TER marine species in this situation thus far. In a study focusing on the preservation of Steller sea lions, Giraud and Valcic discovered that as the geographic scale of the sample increased, the non-consumptive values for protecting the species, found in waters off the coasts of Alaska, British Columbia, and the West Coast of the U.S., grew larger. The greatest WTP estimates were from a sample of American households, next from an embedded sample of Alaskan houses alone, and finally from an embedded sample of Alaskan Boroughs that comprise crucial habitat for Steller sea lions. Wallmo and Lew, however, discovered There are no differences between the WTP calculated from a sample of American households and an embedded sample of American households on the west coast for recovering eight different TER marine species, including species that are only found in rivers in southern California and species that are found everywhere else [9].

Conclusion

Understanding geographic variation in the values of TER marine species is crucial in the context of policymaking because "applying national values may result in an incomplete analysis when populations local to the resource face a disproportionate cost/benefit from the policy." In this study, we give values for eight distinct TER marine species, including the southern resident killer whale Orcinus orca, the hawksbill sea turtle Eretmochelys imbricate, at two distinct spatial scales, humpbacks estimate WTP: (a) randomly selecting more than 5000 American households, and (b) sampling nine U.S. Census areas. Then, in order to ascertain whether species values are statistically different among households in various parts of the U.S., we compare WTP across regions for each of the eight species [10].

Conflict of Interest

The authors declare no conflict of interest.

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