Ecological Economics 154 (2018) 107–116

Contents lists available at ScienceDirect

Ecological Economics

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

Evidence of a Shared Value for Nature

Lisa A. Wainger[a,*], Ryan Helcoski[b,1], Kevin W. Farge[b,2], Brandy A. Espinola[b,3], Gary T. Green[c]

[a] University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory, Solomons, MD 20688, United States
[b] University of Maryland, Sustainable Development & Conservation Biology Graduate Program, College Park, MD 20742, United States
[c] University of Georgia, Warnell School of Forestry and Natural Resources, Athens, GA 30602, United States

ARTICLE INFO

Keywords:
Nonuse value
Passive use value
Ecosystem services
Socio-demographic variability
Social media

ABSTRACT

Ecosystem service analysis aims to expand the accounting of human values for nature, yet frequently ignores or obfuscates a category of human values with potentially large magnitude, namely nonuse or passive use values. These values represent the satisfaction derived from the protection or restoration of species, habitats and wilderness areas, even if people never use them in any tangible way. The shunting of nonuse values to the background of ecosystem service analysis appears, in part, to be an attempt to avoid the perceived elitism of environmental values. To examine whether such values are the purview of the elite, we explore three types of evidence of who holds nonuse values. We find that when people are asked to 1) commit money via stated preference instruments, 2) respond to tweets, or 3) express opinions via surveys they demonstrate a significant willingness to protect and restore natural resources, regardless of their own use of those resources. Such values are represented in all socio-demographic groups that encompass race, ethnicity, immigration status, income, political affiliation, geographic location, age or gender, although the magnitude can vary among groups. The implications are that omitting nonuse values in ecosystem service analysis will tend to underestimate values, particularly for remote sites with limited use, and fail to represent important tradeoffs.

1. Introduction

Ecosystem service quantification and valuation is promoted for its ability to improve evaluation of tradeoffs among beneficiaries when allocating scarce natural resources. Many ecosystem service advocates seek a comprehensive approach to evaluating the effects on public well-being of changes made to natural resources (Costanza et al., 2014; de Groot et al., 2012) and these comprehensive approaches are supported by a thorough classification system of ecosystem services. Most commonly, that classification is based on the Millennium Ecosystem Assessment list of provisioning, regulating, and cultural services (Millenium Ecosystem Assessment (MEA), 2005), although multiple other classification systems have since been proposed (e.g., Haines-Young and Potschin, 2013).

Yet, comprehensive ecosystem service analyses, and the classification systems on which they depend, frequently ignore or obfuscate a component of value that economists consider critical to adequately assessing tradeoffs. The language of ecosystem services is almost exclusively built on human use rather than the appreciation that people have for protecting or restoring ecosystems that they will not use. Because such values can be large and widely shared, they are important for representing the personal loss that people perceive from environmental changes, particularly when benefits stem from preserving wilderness or species that have limited direct use. The appreciation of nature that is distinct from any type of use is called *nonuse values* or *passive use values* in economic and legal contexts, and it represents the intangible or psychic benefits (sensu Dobbins, 1993) that people derive from natural resources or environmental conditions (Freeman et al., 2014; Krutilla, 1967). Omitting such values from policy analyses can have negative consequences for maintaining the full scope of ecosystem functions that improve human well-being.

The case of the massive Exxon Valdez oil spill of 1989 in waters off Alaska demonstrates why these values can have important policy implications. Compared to the recent Deepwater Horizon spill, the direct losses to fishermen and tourist industries in this remote area due to the oil were low. Nonetheless, the Exxon Valdez spill created a substantial

* Corresponding author.
E-mail addresses: wainger@umces.edu (L.A. Wainger), helcoskir@si.edu (R. Helcoski), kevin.farge@tnc.org (K.W. Farge), bespinol@umd.edu (B.A. Espinola), gtgreen@uga.edu (G.T. Green).
[1] Present address: Smithsonian Conservation Biology Institute, Conservation Ecology Center, Front Royal, VA 22630, United States.
[2] Present address: The Nature Conservancy, Legal Data Resource Center, Arlington, VA 22203, United States.
[3] Present address: University of Maryland, Environmental Finance Center, College Park, MD 20742, United States.

https://doi.org/10.1016/j.ecolecon.2018.07.025
Received 6 January 2018; Received in revised form 24 July 2018; Accepted 31 July 2018

public outcry that included a widespread boycott of Exxon gasoline, due to the well-publicized damage to unspoiled ecosystems and charismatic species of birds, killer whales, otters, salmon and other species.

Economists used emerging methods of *contingent valuation* to value the harms that people perceived as a result of the damages to ecosystems and species (Carson et al., 2003), which revealed the large magnitude of the values due to the oil spill. However, the application of nonuse values in assessing natural resource damages was resisted by multiple industries, and the valuation methods were attacked as unreliable, primarily by economists working with oil companies (Maas and Svorenčík, 2017). Partly, as a result of the controversy, the lost value to the public (conservatively estimated at $2.8 Billion in 1990 dollars, for the US) was not directly applied in assessing fines, but did add pressure to consider nonuse values in the settlement and in policy changes.

Although Exxon funded the spill cleanup, paid punitive fines, and compensated commercial fishermen, landowners, Alaska natives and other private parties for damage caused by the oil, none of these payments reflected losses to the greater public from damage to these unspoiled ecosystems. However, a landmark ruling in *Ohio v US Department of the Interior* (US Court of Appeals 1989, 880 F.2d 432) shortly after the spill, affirmed that damage to natural resources can affect people who are not using the resources, and thus should be considered along with use values when federal agencies conduct natural resource damage assessments. This ruling enabled the inclusion of nonuse values as part of the justification for the $900 Million payment by Exxon for natural resource damages (US District Court, Alaska, 1991). The 1989 ruling established a preference for measuring natural resource damages as the cost of restoring or replacing the injured resources as the primary means for incorporating nonuse values. Further, the court preserved the potential use of contingent valuation in assessing monetary damages when restoration is impractical or restoration costs are disproportionate to the harm (discussed in Boyd, 2004).

In contrast to the federal government, private individuals were not granted standing to claim damages from loss of nonuse values (Exxon Valdez, 296 F. Supp. 2d 1071, 1090–91 (D. Alaska, 2004)),[4] which places the onus on government to act in the public interest. The government's ability to balance multiple interests is clearly strengthened by a full accounting of natural resource damages not only in setting monetary damages, but also in establishing the benefit-cost ratio (as calculated or perceived) of new laws and regulation. For example, double-hulled oil tankers, which had not been voluntarily adopted by most companies prior to the spill despite their ability to reduce risk, were required after the spill, among many other legislative changes made to reduce risk and hold companies accountable (Boyd, 2004; Committee on Oil Pollution Act of 1990, 1998).

1.1. Defining Nonuse Values

The ultimate lesson of the public and government responses to the Exxon Valdez oil spill is that damage assessments or ecosystem service valuations that do not include nonuse values can omit entire classes of beneficiaries and underestimate value of some ecosystem changes (Kling et al., 2012; Loomis, 2006). Thus, this case helps to demonstrate why economists consider nonuse values to be an essential complement to use values, when evaluating the total economic value of a change in the environment (Freeman et al., 2014). Nonuse value can be held for many types of goods and services, not only healthy ecosystems, and thus represent an inclusive category of a shared value among diverse people. If someone valued the protection of recreational fishing areas, even if no one in her household fishes nor expects to fish in the future, that would be a nonuse value.

Nonuse values are complex but represent any number of ethical, economic, and social concerns (Krutilla, 1967; Scholte et al., 2015; Spash, 2006; Stern and Dietz, 1994). Many terms are used to describe the sentiments underlying nonuse values, but economists often sub-divide them into *existence*, *bequest* and *altruistic* values (e.g., Turner et al., 2008), to represent the satisfaction that people derive from knowing ecological systems exist, are available for future generations, or are available to others who enjoy or depend on the resources (e.g., indigenous peoples).[5] The gain or loss in satisfaction depends on the magnitude of a change and, often, on the scarcity or substitutability of a good or service, which can vary substantially by context. Economists incorporate this satisfaction into overall *utility*, which is used to sum up the values that people derive from a change in goods or services, as determined by their individual likes and dislikes.

The term *intrinsic value* is often used interchangeably with nonuse values, but the economists' conception of nonuse value is not equivalent to nature's intrinsic value, as described by philosophers. In that literature, intrinsic value emerges from nature itself and is distinct from any *instrumental value* derived from human use or concerns (Callicott, 1989). The belief in nature's intrinsic value and similar value structures that have been described in anthropology, philosophy and psychology are strongly held beliefs. However, such values are difficult to apply to policy analysis because they fail to clarify the conditions under which people should alter or use natural resources to alleviate hunger or address other needs. To incorporate nature's intrinsic value in a quantitative decision support framework, one can consider intrinsic value to be a type of altruistic value. People can express their belief that nature benefits from being undisturbed, in order for that value to be weighed against other concerns (Randall and Stoll, 1983).

Despite a long history of legal support and use in policy (Carson et al., 2003; Johnston et al., 2017), nonuse values are not acknowledged in either recent inclusive ecosystem service analyses (de Groot et al., 2012) or valuation for environmental policy analysis (Interagency Working Group on Social Cost of Carbon, 2010). Ecosystem services are commonly valued in terms of market goods (e.g., wetlands increase home values), natural inputs to production (pollinators increase farmer profits), outdoor recreation (fishing, hunting and viewing), and human health and safety (e.g., how viewing nature improves health outcomes). Recent efforts to broaden ecosystem service measurement have deepened understanding of cultural services, but have largely ignored nonuse values (Daniel et al., 2012; Daw et al., 2015).

1.2. Questions Raised About Nonuse Values

Although economists have recognized nonuse values at least since the 1960s (Krutilla, 1967; Weisbrod, 1964), the measurement of these values are sometimes avoided in policy application for both methodological and philosophical reasons (e.g., Scodari, 2009). To measure nonuse values, investigators use *stated preference* techniques to estimate willingness to pay to increase a good or amenity or willingness to accept compensation for a loss. By definition, nonuse values cannot be quantified using data on actions and therefore these methods use surveys to elicit values (Carson et al., 1999; Freeman et al., 2014). Two common

[4] Full citation: Exxon Valdez, 296 F. Supp. 2d 1071, 1090–91 (D. Alaska 2004), vacated and remanded sub nom. In re Exxon Valdez, 472 F.3d 600 (9th Cir. 2006), opinion amended and superseded on denial of reh'g, 490 F.3d 1066 (9th Cir. 2007), vacated sub nom. Exxon Shipping Co. v. Baker, 554 U.S. 471, 128 S. Ct. 2605, 171 L. Ed. 2d 570 (2008), and vacated sub nom. In re Exxon Valdez, 490 F.3d 1066 (9th Cir. 2007), and vacated sub nom. Exxon Shipping Co. v. Baker, 554 U.S. 471, 128 S. Ct. 2605, 171 L. Ed. 2d 570 (2008).

[5] Some earlier categorization of nonuse values subdivided these values into existence, bequest and option values, where option value stems from wanting to maintain the right to use the resource in the future. However, in recent decades, option value has been classified as a use rather than nonuse value (Fisher, 2000).