

This calculation implies a total WTP to reduce impingement and entrainment losses of \$4.07 to \$7.83 and non-use WTP of \$3.44 to \$6.52 per household residing in the counties abutting affected water bodies. If a 32.4 mile radius is used in these calculations, the implied WTP values to reduce all I&E losses range from \$5.63 to \$23.43 and non-use WTP range from \$5.61 to \$21.83 per household residing in the 32.4 mile-radius area. All values are provided in 2002\$.

2. Future Steps in Analyzing Nonuse Values

In addition to the nonuse valuation approach summarized in the preceding sections, EPA is also exploring and soliciting comment on alternative methodologies for estimating nonuse benefits for the Final rule.

a. Nonuse and Use Values: Literature Review

In response to public comments regarding the analysis of non-use values in the proposed rule, the Agency continues to review and summarize surface water valuation studies that estimate non-use and total use values for water resources. The purpose of this review is to report on the range of nonuse values for water resources in the economic literature, to compare estimates of use and nonuse values for

users and nonusers, and explore the feasibility of deriving nonuse values based on these comparisons.

Based on comments received, EPA is re-evaluating past studies and their applicability to this rule. These studies summarized and compared nonuse and use values (e.g., Fisher and Raucher's (1984) and Brown's (1993)). The Fisher and Raucher's (1984) comparison of nonuse and use values relies on eight contingent valuation studies of benefits of improved water quality published from 1974 to 1983. This analysis served as a basis for developing the 50 percent rule used for estimating non-use benefits in the proposed rule analysis. Brown (1993) conducts a similar assessment of nonuse and use values that relies on 31 contingent valuation studies published from 1980 to 1992.

EPA is also identifying a set of new studies that may contain information about the relative magnitude of use and nonuse values for aquatic resources affected by this rule. As of the publication of this NODA, EPA is reviewing 18 surface water valuation studies that meet a set of criteria for suitability and reliability (e.g., the resource amenities valued in the study must be water bodies that provide recreational fishing, U.S. populations are surveyed in the study, research methods in the study are supported by literature). As a consequence of these

criteria, EPA has identified fewer applicable studies than Brown (1993). These studies use either stated preference or a combination of stated and revealed preference techniques to elicit nonuse and use values associated with aquatic habitat improvements (see document "Comparison of Nonuse and Use Values from Surface Water Valuation Studies" (See DCN 5-1011)). These studies vary in several respects, including the specific environmental change valued, the types of values estimated, the magnitude of the change, the geographic region affected by environmental changes and survey administration methods. EPA is qualitatively analyzing these studies and interpreting relevant characteristics to determine their relevance for the analysis of nonuse values resulting from this rule.

These 18 valuation studies provide 27 observations of use and non-use values associated with various aquatic habitat improvements, because six studies generated more than one nonuse value estimate. A list of the studies being considered by EPA is provided in Table X-43; Appendix A in the document "Comparison of Nonuse and Use Values from Surface Water Valuation Studies" (See DCN 5-1011)" that accompanies this NODA presents key information from each study compiled by EPA.

TABLE X-43.—EXAMPLES OF STUDIES THAT PROVIDE INFORMATION ABOUT USE AND NONUSE VALUES

Author	Year	Title	Source
Clonts & Malone	1990	Preservation Attitudes and Consumer Surplus in Free Flowing Rivers.	In: Social Science and Natural Resource Recreation Management, Joanne Vining, editor. Westview Press, Boulder, CO. pp. 301-317.
Croke <i>et al</i>	1986-87	Estimating the Value of Improved Water Quality in an Urban River System.	Journal of Environmental Systems. Vol. 16, No. 1. pp. 13-24.
Cronin	1982	Valuing Nonmarket Goods Through Contingent Markets.	Pacific Northwest Laboratory, PNL-4255, Richland, WA.
Desvousges <i>et al</i> ...	1983	Contingent Valuation Design and Results: Option and Existence Values.	In: A Comparison of Alternative Approaches for Estimating Recreation and Related Benefits of Water Quality Improvements. U.S. Environmental Protection Agency, Economic Analysis Division, Washington, D.C.
Huang <i>et al</i>	1997	Willingness to Pay for Quality Improvements: Should Revealed and Stated Preference Data Be Combined?	Journal of Environmental Economics and Management Vol. 34, No. 3. pp. 240-255.
Kaoru	1993	Differentiating Use and Nonuse Values for Coastal Pond Water Quality Improvements.	Environmental and Resource Economics. Vol. 3. pp. 487-494.
Lant & Roberts	1990	Greenbelts in the Cornbelt: Riparian Wetlands, Intrinsic Values, and Market Failure.	Environment and Planning. Vol. 22. pp. 1375-1388.
Magat <i>et al</i>	2000	An Iterative Choice Approach to Valuing Clean Lakes, Rivers, and Streams.	Journal of Risk and Uncertainty. Vol. 21, No. 1. pp. 7-43.
Mitchell & Carson ..	1981	An Experiment in Determining Willingness to Pay for National Water Quality Improvements.	Preliminary Draft of a report to the U.S. Environmental Protection Agency. Resources for the Future, Inc., Washington, D.C.
Olsen <i>et al</i>	1991	Existence and Sport Values for Doubling the Size of Columbia River Basin Salmon and Steelhead Runs.	Rivers. Vol. 2, No. 1. pp. 44-56.
Roberts & Leitch	1997	Economic Valuation of Some Wetland Outputs of Mud Lake.	Agricultural Economics Report No. 381, Department of Agricultural Economics, North Dakota Agricultural Experiment Station, North Dakota State University.
Rowe <i>et al</i>	1985	Economic Assessment of Damage Related to the Eagle Mine Facility.	Energy and Resource Consultants, Inc., Boulder, CO.