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Title: Measuring the Total Economic Value of Restoring Ecosystem Services in an Impaired River Basin: Results from a Contingent Valuation Survey

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Abstract:

The objective of this paper is to determine how much local residents of the highly polluted South Platte River (near Denver, CO) were willing to pay through a higher water bill to increase five ecosystem services that could be improved along a 45-mile stretch of the river. These services were dilution of wastewater, natural purification of water, erosion control, habitat for fish and wildlife, and recreation. The contingent valuation method was used in this study to determine an individual's willingness to pay (WTP), or consumer surplus, for the improvements. The contingent valuation method is capable of capturing two passive, or non-use, values not accessible using the hedonic pricing or travel cost methods. These values are the "existence value," or an individual's WTP to know that a particular environmental quality is being preserved, and "bequest value," or an individual's WTP for preservation today so future generations will be able to enjoy the particular environmental quality.

The estimated mean WTP per household was \$21 per month, or \$252 annually. When applied to all households in the 45-mile stretch of river, the WTP for all households together is \$71.148 million dollars. Even using more conservative estimates that assumed some people had no WTP based on their responses to the survey, the totals were still \$29.171 million (for 41% of households willing to pay the mean) and \$18.54 million (for 26% of households willing to pay the mean).

The US Department of Agriculture's conservation reserve program pays farms to idle their farmland to reduce erosion to improve water quality that deteriorates from runoff. In order to create the necessary ecosystem improvement in the willingness to pay question, 300,000 acres would have to be rented at \$41 per acre, which totals \$12.3 million dollars. Even the most conservative estimate of WTP covers this cost with \$6.24 million left over to purchase water to increase the instream flow. When water purchase cost is based on a price of \$30 per acre foot for 37,820 acre feet, the total cost of \$1.13 million still leaves a surplus of about \$5 million to use for various on-site restoration projects. Thus, the WTP for households along the South Platte River easily covers the costs necessary for full ecological restoration and improvement.