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**INTERGRATED MODELING AND ECOLOGICAL VALUATION:
A FRAMEWORK FOR THE SEMI-ARID SOUTHWEST**

David Brookshire*, D. Goodrich, C. Broadbent, M. Dixon, A. Brand, J. Thacher, K. Bnenedict, K. Lansey, J. Stromberg,
S. Stewart, M. McIntosh, D. Kang

ABSTRACT: Conservation of freshwater systems is critical in the semi-arid Southwest where groundwater and flood regimes strongly influence the abundance, composition, and structure of riparian (streamside) vegetation. At the same time these systems are in high demand for competing human use. To address this conflict, natural scientists must evaluate how anthropogenic changes to hydrologic regimes alter ecological systems. A broad foundation of natural science information is needed for ecological valuation efforts to be successful. The goal of this research was to incorporate hydrologic, vegetation, avian, and economic models into an integrated framework to determine the value of changes in ecological systems that result from changes in hydrological profiles. We developed a hydro-bio-economic framework for the San Pedro River Region (SPRR) in Arizona that considers groundwater, stream flow, and riparian vegetation, as well as abundance, diversity, and distribution of birds within a protected area encompassing the San Pedro Riparian National Conservation Area (SPRNCA). In addition, we developed a similar framework for the Middle Rio Grande of New Mexico (MRG). The non-market techniques of Choice Modeling (CM) and Contingent Valuation (CV) were conducted for each site. There are five research components for this project: (1) scenario specification and the hydrologic model, (2) the riparian vegetation model, (3) the avian model, (4) methods for displaying the information gradients in the survey instrument, and (5) the economic framework. Our modeling framework began with the identification of factors that influence spatial and temporal changes in riparian vegetation on the two rivers. We used the construct of "current conditions", as a basis for making spatial predictions of vegetation change and avian populations in both river systems through linked modeling frameworks. Preliminary results will be discussed.

* Professor, Dept of Economics, MSC05-30601, University of New Mexico, Albuquerque, NM 87131 UISA, Phone: 505-277-1964, Fax: 505-277-9445, Email: brookshi@unm.edu