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Calibrating Dissimilar Payment Vehicles in Contingent Valuation Studies: An Example of Reducing Hydrilla in Two North Florida Spring-Fed River Systems – A Preliminary Analysis

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ABSTRACT

In contingent valuation (CV) studies, the willingness-to-pay (WTP) estimate is influenced by the construction of the survey instrument. One key component of the instrument, the hypothetical payment or payment vehicle (PV), is of particular importance and its choice may influence the likelihood of strategic behavior on the part of participants. It is the desire of any CV practitioner or policy maker to avoid strategic behavior and elicit unbiased WTP responses. This is best accomplished by choosing PVs that are both familiar and believable to survey participants. Furthermore, the PV should avoid controversy and by its nature remind the participant of their household budget constraint.

Policy makers wish to compare the WTP to reduce the presence of the invasive aquatic weed *Hydrilla verticillata* by 50% in the Wacissa River, a spring-fed system with free public access. A comparable nearby river system (Wakulla Springs) has gated fee-access. Three hundred visitors of these two systems were randomly sampled during the summer of 2012. Visitors to the free-access system were asked their WTP for hydrilla reduction using a utility-PV CV. Visitors to the gated system were asked the same question but one half were presented with a gated-PV CV and the balance were presented with the utility-PV CV. The results provided a conversion index that allowed policy makers to directly compare WTP across the two systems.

INTRODUCTION

Hydrilla (native to South America) is naturalized and invasive in the United States following a release in the 1960s from aquariums in Florida waterways near Miami and in Crystal River and grew rapidly though out the state of Florida (Langeland,1996) . By the early 1970s, hydrilla was established in water bodies of all drainage basins throughout the state. By 1988, authorities were spending about \$7 million annually in attempts to control about 6,000 ha of waterways (Schmitz 1991) . The attempts to control hydrilla are to mitigate and control the harmful impacts of hydrilla, public and private agents have attempted to eradicate the invasive in several areas.

OBJECTIVES

- The overall goal of this multi-year research was to estimate the economic value of controlling the level of hydrilla infestation in two freshwater spring systems in north Florida: Wakulla Springs and the Wacissa River. More specifically the objectives were to:
- Develop the appropriate economic survey instrument for the Wakulla Springs and Wacissa River systems.
 - Sample the recreational users of these two systems to determine the value they placed on reducing the presence of hydrilla from these waterways.
 - Develop a hypothetical demand function for reducing hydrilla density by 50%.
 - Develop probit choice model to characterize the information of party group attributes that determine the WTP for reducing hydrilla density.



Commonly current hydrilla density



Hydrilla density reduced by 50%

METHODOLOGY

The survey instrument was design to elicit information about recreational use and develop a hypothetical demand function for modeling the value of reduced hydrilla density. The instrument was divided into three sections:

First came the introductory section, which set the tone for decision making and budget allocation. It reminded the interviewee of potential substitutes for this hypothetical good, establishing a budget constraint.

Second, the demographics section, where information such as party size, length of stay, gender, age, and site-based activities was collected.

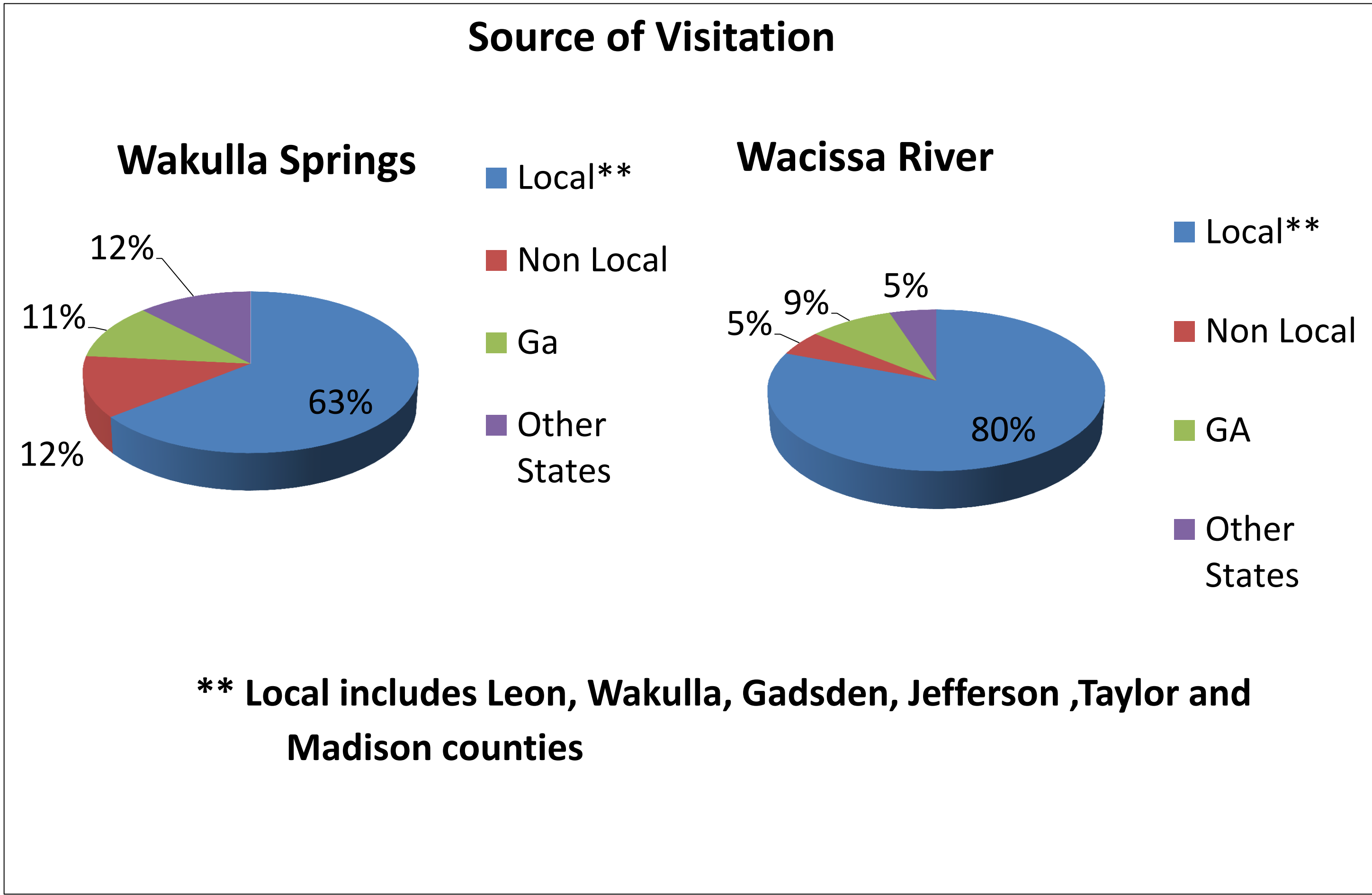
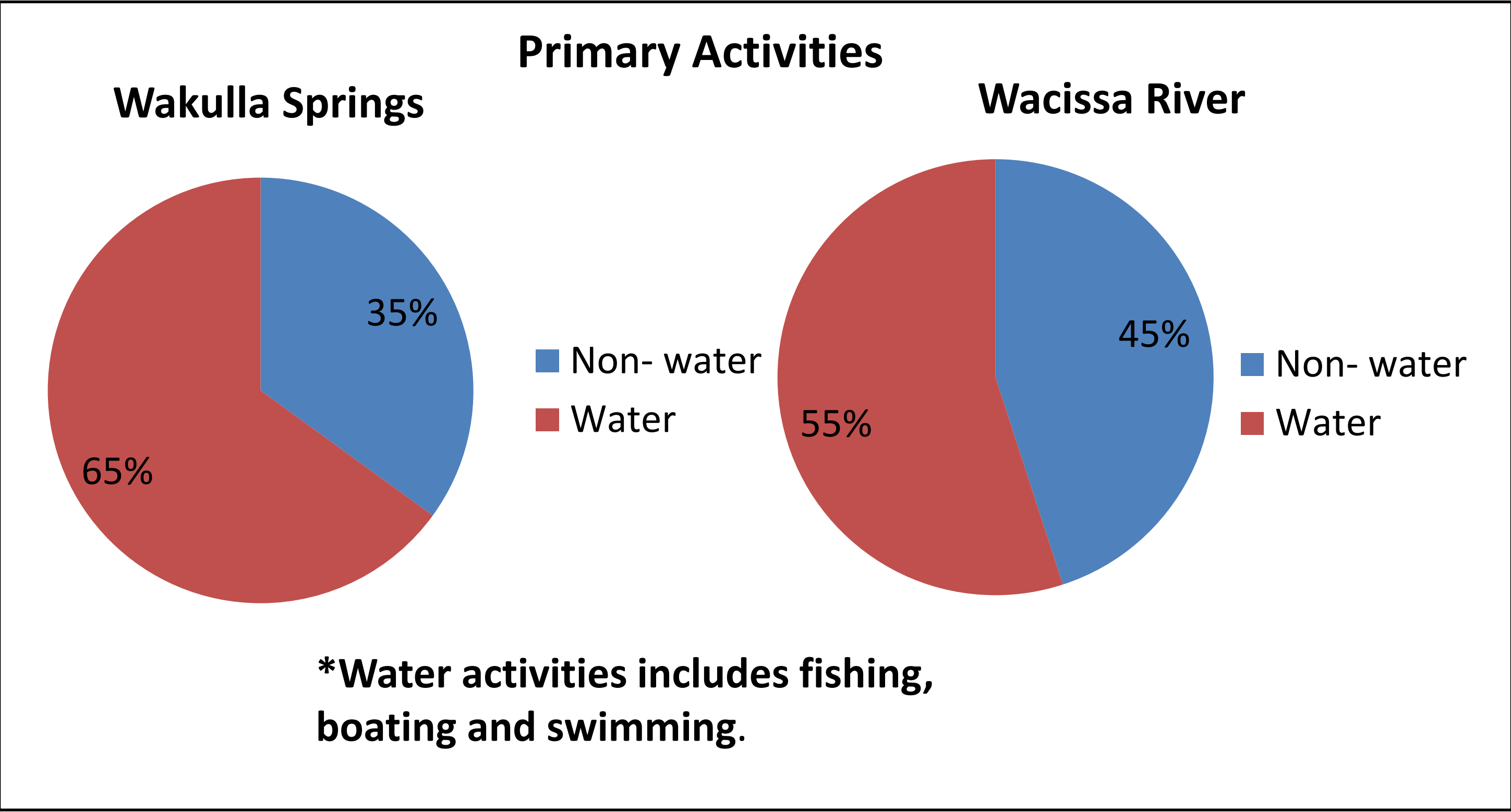
The third and final section, described the hypothetical amenity and its price. The hypothetical amenity was detailed along with a program for its implementation, including the contingent method of payment. Individuals were presented with a choice to purchase this amenity (50% reduction in hydrilla density) for a specific price. The price ranged from \$1 to \$10 for those who were presented the gate fee method of payment and from a \$0.50 to \$5.00 monthly surcharge for those who were presented with a utility bill method of payment. The resulting price quantity comparing was use to develop a demand function for reducing hydrilla density. both linear and ln,ln models was considered. A sample of 315 recreational users of these two sites were interviewed from July 4, 2012 to September 3, 2012.

PRELIMINARY RESULTS

Average willingness to pay per site

Site	Utility Bill (Per month)	Gate Fee (Per trip)
Wakulla Springs	Avg=\$1.63 Std=0.15 (n=109)*	Avg=\$3.76 Std=0.30 (n=106)
Wacissa River	Avg=\$1.49 Std=0.15 (n=102)*	

*Significantly different at 95% level



Results from the Wakulla Springs utility bill PV were converted and scaled to match the Wakulla Springs gate fee data. They were then used to estimate demand in both linear and ln, ln functional forms. The Wacissa River utility bill PV data were likewise converted to a gate fee. For Wakulla Springs, the results of the demand analysis from the converted data were compared to those from the gate fee outcome and found to not differ significantly. The two Wakulla Springs data sets were then combined into one dataset and compared back to the Wacissa River converted data set. These two results did not differ significantly.

Coefficients of Demand for Wakulla Springs: Gate Fee PV vs. Converted Utility Bill PV, by Functional Form		
Source	Linear	Ln,ln
Wakulla Springs Gate Fee	-0.54*	-3.81
Wakulla Utility PV converted to Gate Fee	-0.20**	-6.92*

Coefficient s of Demand by Study Site: Combined Wakulla vs. Wacissa River, by Functional Form		
Source	Linear	Ln,ln
Wakulla Springs combined	-0.19*	-5.24**
Wacissa Utility PV converted to Gate Fee	-0.34*	-4.69*

*Significant> 99%
** Significant> 90%.

CONCLUSION

- Respondents from both study sites and PVs have a significant and positive WTP for reducing hydrilla density
- The demand for reduced hydrilla density behaves as expected: significant and negatively slope
- The coefficients of demand based on a gate fee PV do not significantly differ from those based on a converted and scaled utility bill PV.
- Likewise, demand for hydrilla removal does not vary between study sites

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