



## Estimating Flagstaff Residents' Willingness to Pay for Forest Restoration in the Lake Mary and Upper Rio de Flag Watersheds: A Pilot Study

### Introduction

The quantity and quality of water from publically owned National Forests is highly dependent upon forest conditions and land management. Previous land management practices have predisposed forests to unhealthy conditions and uncharacteristically severe wildfires. Severe wildfire can lead to increased post-fire run-off, erosion, and sedimentation.

Ecological restoration helps to restore forest health and reduce the probability of catastrophic wildfire. Ecological restoration generally involves a combination of mechanical thinning and prescribed burning in order to restore health and resilience to forests. Maintaining forest health following restoration requires follow-up management such as prescribed or managed burning and monitoring.

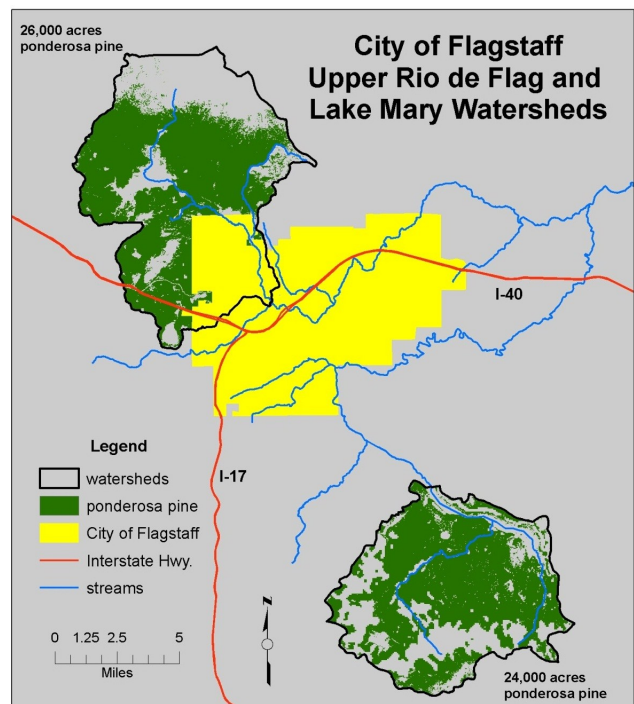
Without large-scale restoration, fire suppression and post-fire rehabilitation costs will continue to grow. In order to treat forests at the pace and scale required, the Four Forest Restoration Initiative (4FRI) was established with the goal to treat one million acres over 20 years. Unfortunately, the cost of restoration is a significant barrier to reaching this goal. Limited federal budgets impede the pace of restoration. However, numerous economic analyses confirm that it is more cost-effective to restore forests than to pay the full costs associated with severe wildfire. The ability to protect the water and watersheds of Flagstaff may depend upon whether beneficiaries (Flagstaff residents) are willing to help pay for restoration in order to obtain the benefits of improved watershed services.

### Purpose

The purpose of the study was to estimate the willingness to pay (WTP) of Flagstaff residents for forest restoration in the Lake Mary and Upper Rio de Flag watersheds. Both the Lake Mary and Upper Rio de Flag watersheds provide municipal water for residents of Flagstaff, Arizona.

### Method

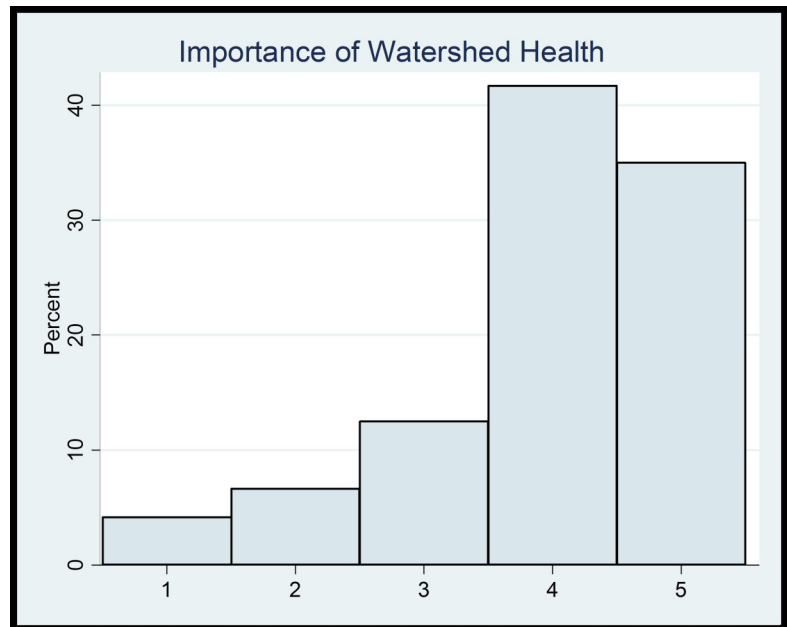
There were 490 surveys mailed to Flagstaff residents with 120 responses and 48 that were undeliverable, resulting in a response rate of 24 percent.



**Figure 1.** Map of the City of Flagstaff Upper Rio de Flag and Lake Mary Watersheds.

## Results

- **Wildfire prevention is a high priority to the residents responding to the survey.** The survey asked, “Considering the full range of issues you face, how important is wildfire prevention to you?” On a scale of 1 to 5, where 1 indicates “Not Important” and 5 indicates “Extremely Important” the mean response was 4.52, indicating that wildfire prevention is a high priority for respondents.
- **Watershed health is a high priority to the residents responding to the survey** (Figure 2). The survey asked, “Considering the full range of issues you face, how important is watershed health to you?” On a scale of 1 to 5, where 1 indicates “Not Important” and 5 indicates “Extremely Important,” the mean response was 3.97, indicating that watershed health is a high priority for respondents.
- Respondents were asked about their awareness of the link between forest restoration and watershed health. On a scale of 1 to 5, where 1 is “Not at All Aware” and 5 is “Very Aware,” the mean value was 2.9. **The results show that most of the respondents consider themselves at least “Somewhat Aware” of the link between forest restoration and watershed health.**
- Based on the survey results and a preliminary analysis, **Flagstaff residents are willing to pay an average of \$4.76 per month on their water bills to fund monitoring and maintenance of the forest restoration in the Lake Mary and Upper Rio de Flag watersheds.** This can result in a net annual benefit of approximately \$1.1 million. These results provide evidence that a potentially sustainable outlet for funding maintenance of forest restoration thinning is through charging beneficiaries (Flagstaff residents) for forest restoration.
- **When asked to indicate how concerned they are about the threats to the Lake Mary and Upper Rio de Flag Watersheds that include catastrophic fire, drought, flooding and global climate change, they were most concerned about wildfire and drought.**
- **Thirty-three percent of respondents were aware of the Four Forest Restoration Initiative prior to the survey.**



**Figure 2.** Graph displaying the importance of watershed health for Flagstaff residents.

## About the Study

This study was conducted by Dr. Julie M. Mueller, Assistant Professor, The W.A. Franke College of Business, with support and funding from the Ecological Restoration Institute, the Northern Arizona University Faculty Grants Program, the W.A. Franke College of Business, and the City of Flagstaff Utilities.

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