



Short communication

Toward estimating the value of stewardship volunteers: A cost-based valuation approach in King County, Washington, USA



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ABSTRACT

Urban forestry professionals are increasingly challenged to find cost-effective strategies for resource conservation and management. Many organizations partner with citizen groups to host events that enlist volunteers to perform stewardship tasks like tree planting and trail maintenance. These volunteer programs incur costs to both the managing agency and partners, such as staffing, tools, and transportation. Volunteers contribute uncompensated time and expertise. Little is known about these contributions, yet citizen stewards and host groups represent an important human dimension of urban forest management. Using a survey administered to volunteers and host organizations at restoration events in King County Parks, WA, USA, we developed a cost-based approach to estimate the value of stewardship activities that occurred in the spring field season of 2011. Expenditures included volunteer and event host time and direct cost of traveling to and from events, on-site labor, equipment, and preparation costs. Results suggest that contributions made by volunteers and hosts are significant; the combined costs associated with the 17 sampled events was approximately \$35,700. These efforts represent a small subset of the more than 1000 volunteer environmental stewardship activities that take place annually in King County.

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Introduction

In the face of limited and declining fiscal resources for urban forest management, managers and organizations are actively seeking lower-cost solutions to achieve conservation goals. Volunteer stewardship activities can play a significant role in ecological recovery and management (Frumkin, 2003). Many cities enlist volunteers to implement stewardship activities as part of their strategy. In urban areas, volunteers can be critical, both in terms of garnering community and political support and completing projects that tend to be large in number, small in scale, and widely dispersed across large geographic areas (Wolf et al., 2011). In assessing the research needs of urban forestry professionals in the Pacific Northwest, Wolf and Kruger (2010) found that cultivating volunteers and citizen stewards was one of the most pressing issues. Recent research in New York City, Chicago, Baltimore, and Seattle, all USA, suggests that using volunteers is a particularly effective strategy in urbanized areas where citizen action may be more ubiquitous than previously recognized (Andersson et al., 2007; Svendsen and Campbell, 2008;

Wolf et al., 2011). In the King County metro area in Washington State (which includes Seattle), more than 600 environmental stewardship organizations employing over 100,000 annual volunteer hours have been identified (Brinkley et al., 2010). The sheer volume of volunteer hours suggests that the collective impact of activities may be substantial from both social and ecological perspectives (Wolf et al., 2011).

The purpose of this study is to estimate the value of volunteer contributions at environmental stewardship events using costs associated with participation as a proxy for that value. Volunteers are not a free resource, yet published work to accurately quantify the contributions associated with hosting and participating in volunteer efforts is scant. Few organizations record or estimate the value of volunteer work to their own organization (Mook et al., 2005). Handy and Srinivasan (2005) found that factors such as cost to organizations in recruiting and managing volunteers are rarely accounted for or included in budgeting or accounting processes. Moskell et al. (2010) examined motivations and strategies for stakeholder engagement in urban forestry, but did not address the value of contributions. Information on the costs of participating in restoration is often lacking because of the resources required for data collection and analysis (Guinon, 1989; Zentner et al., 2003; Robbins and Daniels, 2012).

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Volunteers at stewardship events perform a wide assortment of tasks, from event management to strenuous field work. The skill level associated with volunteer work varies from unskilled to highly skilled. Many studies have noted the difficulty in determining an appropriate wage to apply to volunteer activities across all types of work (Brown, 1999; Pho, 2004; Handy et al., 2008; Bowman, 2009). Leete (2010) proposed selecting a wage rate that most accurately reflects the actual work being performed by each volunteer. A replacement cost wage is equivalent to the hourly rate the volunteer would earn if being paid to complete the same task (Brudney and Nezhina, 2011). Some organizations, including the City of Seattle, simply apply a uniform dollar value to volunteer hours spent on-site. The Independent Sector (IS) is a widely cited source that publishes one average hourly wage rate for each state to estimate a value for volunteer time (Independent Sector, 2011). Although easy to apply, uniform rates do not adequately account for the variety of tasks associated with volunteer activities. In our research, no studies were found that included contributions like time spent traveling to and from a worksite, tools and equipment, or efforts of host organizations that sponsor volunteer field events.

Method

We adapted existing methods into a cost-based approach, drawing from nonprofit management and recreation research. Techniques employed here combine aspects of travel cost methods (Parsons, 2003) used widely to value recreation sites, replacement cost approaches to value onsite labor, and market valuation methods to estimate the value of materials, equipment, and preparation time. This methodology was applied to facilitate comparing costs across different activities and events and allow for standardized cost reporting for volunteer stewardship events held in King County, Washington in Spring 2011. Results represent our initial implementation of this cost-based system.

Data were obtained from a survey designed and implemented by Forterra, a non-profit group that conducts ecological restoration events across Western Washington. The survey was implemented between April and June of 2011 at restoration events occurring within the 26,000 acres owned and managed by King County Parks, an organization that relies heavily on volunteers to achieve stewardship goals. In 2010, more than 8500 volunteers provided 57,400 hours of service at 460 events on Parks lands, such as removing invasive plants, planting trees, and maintaining hiking trails (King County Parks, 2012).

King County works in conjunction with local non-profit organizations and community groups to plan and host events. Events are often hosted by a staff person from the County or another organization. Recruitment of volunteers happens through both formal and informal channels. The County posts a calendar of events, but community organizations also spread announcements through emails, newsletters, and word of mouth. Volunteers arrive at the event and are given a short welcome, an overview of the site and work to be completed, a tool demonstration, and a safety talk. A host or an experienced volunteer demonstrates the task for the day, such as invasive plant removal. Volunteers are then divided up and sent to work. The event ends with a gathering of participants for lunch and a discussion and review of the day's accomplishments. Typically the work accomplished is highly visible, representing a section of forest with invasive species removed, new trees planted, or trails maintained.

Our analysis began by administering the survey at volunteer events. A random sampling strategy was applied in two steps. First, 17 out of 35 total planned volunteer restoration events were randomly selected. Then the survey was administered to randomly selected individuals by on-site intercept. Events were usually

held on weekends and averaged 24 participants, but attendance varied widely from two to 80 volunteers. Overall, 164 volunteers were surveyed out of 421 total volunteers. In addition, 14 host organizations were surveyed, completing 27 surveys. Hosts were individuals responsible for recruiting and managing volunteers onsite and carrying out events. These included King County Parks, and a variety of secondary organizations supporting event activities like "Friends Of" groups, Washington Trails Association, and corporate sponsors like Starbucks and REI. Depending on the event size, there were typically one to four paid staff in attendance; their roles were to direct work activities, ensure safe practices and initiate and conclude events. Paid staff was surveyed as hosts. The 17 sampled events focused on invasive plant removal (9 events), potting and nursery work (3), trail work (3), and mulching projects (2).

The participation cost is the sum of all costs required to attend or host the event and can be expressed as:

$$\begin{aligned} \text{participation cost} &= \text{vehicle cost} + \text{travel time cost} \\ &+ \text{on-site time cost} + \text{equipment cost} + \text{preparation cost.} \end{aligned}$$

Vehicle cost is the per-mile cost of operating a car; travel time cost is the cost of round trip travel time. Here, we assume that trips are single purpose; that is, volunteers leave home, travel to the restoration site, engage in the activity, and return home. Both vehicle and travel cost calculations require first determining distance travelled. To protect privacy, respondents were not asked for their home address, so travel distances were estimated using reported home zip codes. Geographic coordinates of each event were imported into ArcMap 10 GIS software and multiple point distance analyses were performed using the Point Distance tool. The distances from each participant's home zip code centroid to the event site were summed to calculate the total distance travelled. Straight line distance was used as opposed to street grid because of the difficulty in determining routes without home addresses.

For respondents arriving by car, round-trip distances were multiplied by \$0.515 per mile to arrive at a vehicle cost. This rate is used by the federal government for mileage reimbursement (United States General Services Administration, 2012). Estimating travel time required assumptions about the speed of travel. Although two volunteers walked and one took a bus, the survey indicated that 98 percent of volunteers and all hosts arrived by car. Travel speeds were assumed to be 3 mph for walking, 25 mph for bus, 25 mph for cars travelling less than 10 miles and 45 mph for cars travelling greater than 10 miles. Round-trip distance was divided by the assumed speed to estimate the total time spent in transit for volunteers and hosts. Using this approach, we estimated that volunteers traveled nearly 3700 miles to attend the 17 sampled events; hosts traveled 735 miles.

Since event duration was known, the next step was to estimate each respondent's travel and on-site time cost. Event organizers typically tally volunteer hours onsite; sign-in sheets are used for reporting, tracking, and budget purposes. We used a replacement cost approach to assign a wage rate based on each respondent's reported level of experience as a restoration volunteer or host. The State of Washington publishes prevailing wage rates for public works contracts (Washington Department of Labor and Industries, 2011). The Landscaping or Planting Laborer job classification most closely mirrors the work performed by restoration volunteers. L & I distinguishes between apprentice-level and journey-level when determining prevailing wages. Apprentice laborers are paid in a series of steps based on hours of experience. Accordingly, volunteers who reported 1–1000 hours of experience were assigned a wage of \$13.40 per hour; those with 1001–2000 hours were assigned \$14.30 per hour, 2001–3000 hours were assigned \$15.19 per hour, and 3001–4000 hours were assigned \$16.98 per hour. The

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