

WATERSHED RESIDENTS' SURVEY

A social survey of residents within the Upper Granite Creek Watershed was conducted between December 15, 2009 and March 15, 2010. The survey was designed to gather information about watershed residents' knowledge of watershed and water quality issues; perceptions of water quality; attitudes and values about protection and restoration of local water ways; and environmental behaviors. A copy of the survey can be found in **Appendix B**. The goal of the survey was to identify gaps in public knowledge and to develop an outreach and education strategy (outlined in Chapter 3) to accompany the WIP and project implementation.

Delivery Modes

The survey was a self-administered questionnaire distributed by mail as an insert in the City of Prescott water bill, through Valpak of Northern Arizona, and through the internet using SurveyMonkey™ online software. The mail survey reached 21,000 households on the city's water/sewer service and 30,000 people through Valpak Neighborhood Trading Areas for Prescott (East, South, and West), which includes Skull Valley and Bagdad.

Data Analysis Methods

Survey data was analyzed by Eugene Schmidt, a retired statistician and a WIC volunteer. Mr. Schmidt has a background in data analysis for organizations such as Maricopa Community Colleges where he taught, Phoenix Children's Hospital, Maricopa Association of Governments, Salt River Pima Maricopa Indian Community, and, most recently, the City of Prescott Water Conservation Committee.

Scales, almost always from one to five, but also dichotomized such as for Gender (M/F), or questions eliciting a yes/no response, were correlated with each other, or more often grouped into aggregates of closely related survey items and then correlated with other aggregates. For example, survey items about protection were grouped and contrasted with items about restoration, producing two generalized aggregate measures. Other aggregates concerned commitment to, or knowledge of, waterway protection efforts. Other measures scaled importance of water quality for economic development or quality of life. Then comparisons could be made, for example of aggregated scoring of concerns about protection versus restoration, relative to the importance of water quality for economic development or quality of life. Because of the large sample size, differences cited were almost certainly each statistically significant, usually at high confidence levels.

Limitations

Because survey respondents were "self-selected" (i.e.; chose to complete the survey and return it), the data was subject to self-selection bias, or the distortion of the statistics based on how the sample was selected. In other words, one could speculate that those who chose to respond to the survey did so because they are already interested in and had knowledge about the survey topic. However, because the survey return was so great the effect of this bias on the statistical reliability of the results is negligible. The diversity in the responses to many survey questions further supports this.

Findings

Protection and/or restoration of waterways, and the values reflected in reasons for protection, were aligned in the analysis of the survey results with the knowledge, commitment and active involvement in environmental efforts demonstrated by individual respondents. Respondents' concerns and awareness of water quality threats, aligned with demographic characteristics such as education and income levels, as well as age, and particularly gender, were closely examined in the hopes of designing outreach efforts to broaden support for watershed improvement through education and awareness.

Those many residents who responded to the survey (numbering 1482) were mostly strong in favoring protection and restoration of water quality and ecological vitality of the creek and lake system. Variation in respondent knowledge and awareness of pollution sources was analyzed in conjunction with variability in commitment to learning more about the topic, willingness to pay a monthly fee to assist watershed protection and maintenance, and already established involvement in recycling, learning of household and community wide pollution sources, and following government and agency reports on water quality.

Protection and Restoration in Relation to Knowledge, Involvement and Commitment

A number of survey items questioned general attitudes on the importance of protection and/or restoration, often similarly worded but emphasizing one or the other. Thus while endorsement of both protection and restoration was typically coupled, they could also be contrasted where one or the other was rated a bit higher in importance. Protection was associated with ecological concerns such as for wildlife, as well as for water quality and environmental stewardship. Restoration was associated with pollution abatement or waterway improvement efforts, concern over water quality deterioration over time. Some other restoration items emphasized a sense of urgency in addressing pollution, so that in contrast to the general endorsement of protection, restoration with urgency reflected a "just fix it" emphasis. Females were more likely to favor Protection survey items and males to favor restoration items, with the "just fix it" emphasis. Restoration was more often associated with economic development rationales for water quality, and protection associated with quality of life and ecological rationales, such as for wildlife protection.

While protection and restoration are the primary themes resulting from the survey, crafting messages specifically to increase knowledge of local water quality problems, engagement in pollution control, and commitment to sustainable solutions are the means by which public support for watershed improvement efforts can be increased. The survey assessments of respondents' knowledge, involvement, and commitment showed strong, positive and discriminating correlations with ratings of pollution threats and also creek system benefits. Stronger endorsement of protection and restoration matched evidence of greater knowledge, involvement and commitment, far more so than demographic determinants like age, occupation and income. But also, knowledge, involvement and commitment were also found to amplify gender differences, especially the agreement with protection concerns by females compared to males.

Those who endorsed both protection and restoration, and also those who more regularly endorsed protection *over* restoration, scored higher on knowledge items from correctly identifying the watershed and a nearby creek or lake, to citing agency reports on water quality over media reports as a source of information, and reporting more knowledge demanding occupations and avocation interests. Similarly those endorsing survey items worded more toward prevention than repair of waterway problems had more knowledge-demanding occupations and interests, better knew their watershed, and were much more likely to rely on government or environmental reports than on media reports.

Willingness to Support a Watershed Fee

Asked whether they would be willing to pay a monthly fee to “support local watershed management activities”, and then asked to indicate the amount they would be willing to pay (through check boxes), respondents showed their instrumental support for watershed protection and restoration. A final question on the survey also explicitly questioned respondents’ commitment by asking if they were “interested in learning more about this project.” Yes or no responses to these questions, and the amount suggested by those willing to pay a monthly fee, formed the commitment measure. Respondents more positive on ecology concerns were more willing for a monthly fee and also to learn more about watershed improvement. Respondents more positive on economic reasons for increased protection and restoration were less willing for a fee and less willing to learn more. But these differences were not impressive until coupled with gender. Female respondents were more likely to be willing to pay a fee and to learn more, while also more often offering ecological concerns over economic reasons for waterway protection. Public support for watershed improvement is most likely to arise from a vanguard of women responding to protection and prevention arguments.

There was also evidence for those female respondents lacking commitment (unwilling to pay a fee), who were younger and with lower income, perhaps a rejection of an additional household cost, not a disregard for water quality. This last finding showed through clearly in other comparisons. For example, for females with either an ecology or economy emphasis to their concerns, a fee cost seemed to undermine commitment even when active and knowledgeable. Fees for watershed protection that are not presented as clearly progressive would undercut support from otherwise very supportive females.

Information Sources

Another commitment predictor for respondents was their declared source of information on water quality and watershed issues (Q7). Their responses showed very steep declines from reliance on government or environmental organization’s reports to reliance on media reports or personal observation, across all levels of fee endorsement, with lessened commitment and involvement indicator ratings. Those respondents who relied on media as a source of water quality information were less likely to favor a fee and less likely to agree to the broader selection of support indicators. There would appear to be those outside the reach of reliable information on water quality whose awareness and support could be increased because they do favor a fee, if only information were to find its way inside their sphere of knowledge sources. Information on

types of pollution threats in the waterways, their sources, and both public and individual corrective efforts need to come from many sources which should include the media, but also from outreach to influential groups, which might also receive media coverage.

Awareness of Pollution Sources

Respondents were asked to rate the twelve sources of pollution for their local impact. Analysis of the pollution ratings revealed a tendency for waste sources (leaking sewers, septic tanks, livestock manure, pet waste) and run-off sources (storm run-off from roads and roofs, lawn fertilizer or pesticides, commercial/industrial spills, construction site run-off) to be grouped with similar ratings. Within the sets of waste and run-off sources were additional differences in problem ratings for more obvious, perceivable and conceivable sources, or more demanding of imagination with apparently different reasons for diminishing or dismissing the sources as important problems. Beyond lower ratings (“Not a problem”, “slight problem”, “moderate . . .”) there were differences in proportions of “Don’t Know” or ratings left blank. When analyzed in terms of differences in ratings for those most knowledgeable, versus most committed (willing for a fee), or low on both knowledge and commitment, yet additional reasons for low ratings or non-ratings seemed to be suggested. Non-response options were greater for the six waste items, suggesting an aversion to contemplating, especially human waste sources, and especially for those lowest on both knowledge and commitment.

The “less obvious” set of sources was consistently seen as a greater local problem by more sophisticated respondents. These were those respondents most involved, committed, and concerned about ecology. The differences were largest and most consistent for the most committed to a monthly fee. The “more obvious” pollution sources were rated lower in importance, by those specifically not so concerned about pollution, and less likely to consider pollution “a problem that needs to be addressed”, not worse than ten years ago, and less important to promote economic development. The differences in the importance ratings of these two sets of pollution sources were not so much large as consistent across a range of other survey items assessing involvement and commitment. For other demographic measures, such as gender, education level, income, or occupation, the differences between the less and more obvious sources were not as great. In comparing those with a repair attitude to those with a prevent attitude, those who wanted repair (“just fix it), found all the sources, both more and less obvious, important. It seems likely that ecologically oriented respondents attributed greater importance to the less obvious sources because they wanted to learn more about them. Also likely is that less committed respondents indicated little concern about pollution threats that they “didn’t want to hear about”, such as septic and commercial sources of pollution.

Septic Tank Owners; Dog Walkers

Respondents with septic systems were 21% of those surveyed. Awareness of their septic system’s age was good (77%), with a strong majority reporting have performed recent maintenance, for either those with standard or alternative system types. Those with standard systems who also knew the age of their system were most likely to have maintained the system recently. The respondents with standard systems were significantly stronger than alternative system respondents on general ecological protection items on the survey. Alternative system

users scored lower than all respondents on ecology. Compared to respondents on the city sewer system, respondents with septic systems were more proactive (rainwater harvesting and composting) and more concerned about pollution.

Respondents with dogs were 40% of those surveyed, and 86% of those with dogs walked them regularly. Those who reported they always picked droppings while walking their dog were three to one a majority over those who reported they seldom, rarely or never picked-up. Dog walkers who regularly picked up after their dog were almost as likely to agree pet waste was an important pollution problem as those without a dog, but those who didn't pick up or didn't walk their dog saw the pollution problem from pet waste less important. All those who walked their dogs were more willing to pay a monthly fee for watershed management than those without a dog or who didn't walk their dog. All dog walkers were more concerned about the environment than those who didn't walk or did not have a dog. Fewer respondents with a septic tank and a dog picked up after their dog, but those who did pick up regularly were much more likely to have their septic system serviced recently.

Surprisingly, those who seldom picked up after their dog were younger, more active, with more education, more challenging occupations, interests, and better earnings. They also show more awareness of worsening waterway pollution, and claim they know what to do, and that individuals can make a difference in local water quality improvement. Those who didn't walk their dog and also those who picked up after their dog regularly were older and had higher income. A mixed picture on septic maintenance and appropriated collection and disposal of pet waste suggests an area in need of education and encouragement.

Conclusions

The mostly positive relationships between knowledge, commitment, awareness and ecological concern were taken to bode well for the planning and success of community education and awareness efforts, especially when focused on gender, education level, and information source differences. Knowledge and commitment tied to protection and pollution concern promise outreach receptivity among interest and activity groups such as garden clubs, hikers, activists, volunteer, or natural history groups.

Protection and restoration were both clearly endorsed by those responding to the survey, with the more knowledgeable respondents favoring protection a bit more than restoration. Support for restoration favored more by those wanting repair, wanting to “just fix it”, especially those viewing restoration as critical to local economic development. Females, especially those more knowledgeable, were the vanguard of protection and prevention concerns, while males, especially those with economic concerns favored more restoration and repair. The contingent of respondents who disliked social/community values as a reason for protection, represented the perspective of a small minority, compared to the wider favoring of waterway stewardship and ecological reasons for protection.

Commitment among respondents, measured by support for a monthly fee and indicators of active involvement, were the most evident correlate of protection and restoration both. While knowledge was the best predictor of whether a respondent favored protection, both public and

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individual action measures were strong predictors of both protection as well as restoration. Thus, public outreach emphasizing education and mechanisms for engaging the community might be most likely to strengthen attitudes favoring protection and restoration efforts.

Further details on the survey data, analyses, and findings are contained in the document titled “Watershed knowledge, perceptions, and preferences of residents in the Upper Granite Creek Watershed, Arizona.”