

**Understanding homeowner reactions to rain gardens: focus group
reviews of the Maplewood Rainwater Garden Projects**

Research conducted in cooperation between the City of Maplewood, the Maplewood Nature Center and the Wisconsin Department of Natural Resources under support from EPA grant number.....

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Introduction

The following report has been constructed from data gathered from two focus groups, held on Tuesday, May 21, 2002, at the Maplewood Nature Center in Maplewood, Minnesota. The focus groups were organized as a cooperative venture between staff from the City of Maplewood and the Wisconsin Department of Natural Resources. The focus groups served a dual purpose: they allowed the City of Maplewood to review recent stormwater projects involving rain gardens and they gave the Wisconsin DNR an opportunity to investigate how homeowners respond to the option of having a rain gardens on their property. The Wisconsin DNR came to Minnesota for this investigation because there is as yet no comparable group of homeowners in Wisconsin.

Very little if any research has been conducted on the topic of how homeowners react to rain gardens. This paucity of research is a direct consequence of the fact that such gardens are so new. The only relevant research of which we are aware does not specifically address rain gardens (Nassauer, 1993). It speaks to how people perceive of different plant community arrangements. It may be useful for designing types of gardens to offer to homeowners. But it does not address the kinds of constraints our research has identified, with the exception of a slight overlap on the issue of people's relation to plants (whether or not they are gardeners in our case, "knowledge of indigenous plant communities" in Nassauer's case).

By contrast, the homeowners from which the present focus groups were drawn had direct experience with rain gardens being installed in their neighborhoods as part of larger projects encompassing road reconstruction and stormwater re-engineering. These neighborhoods were already fully developed long before the present projects were undertaken. Therefore, the rain

gardens at issue here are retrofits. This fact has both positive and negative aspects. On the negative side, much of the interest in rain gardens has focused on the feasibility of their installation in *new* developments. The results of the present study of rain garden installations in *existing* developments therefore will be limited in their applicability to new developments. On the positive side, the fact that the earliest widespread installation of rain gardens has occurred as retrofits may indicate a promising pathway for getting this new technology on the ground and through practical trials. Furthermore, our recent research indicates the existence of a variety of challenging barriers to the installation of rain gardens in new developments. Therefore, it would seem well-advised for research to go where the action is.

The strength of the present focus groups is that they bring to the table people who have had first-hand experience with rain gardens. That experience includes deciding whether to have such a garden, hands-on experience installing and tending the gardens, as well as practical interactions with the municipality—the City of Maplewood—that oversaw the project. Such interactions—whether with a municipality or other organized entity—are a crucial part of any attempt to bring rain gardens into operation in anything more than piecemeal fashion. The practical importance of such interactions adds to the value of the present research. Because the present report is intended in part to help the City of Maplewood improve its future performance on such projects, the analysis of this interaction has mainly addressed the strengths and weaknesses of the city’s program. The assessments of the city’s performance contained here are based on the judgments of city residents. Needless to say, these judgments may be more or less accurate. But regardless of their accuracy, they represent an indispensable perspective.

The first focus group was composed of residents who opted to have a rain garden

installed (hereafter referred to as “gardeners”). The second focus group was composed of those who refused a garden (hereafter “non-gardeners”).¹ Though the report is not organized around these separate groups, the comments of gardeners are distinguished from those of non-gardeners throughout.

The value of homeowner choice

By and large, the City of Maplewood let residents decide for themselves whether they would have a rain garden. There was general agreement (across gardeners and non-gardeners alike) that leaving the choice to homeowners was a valuable element of the program for several reasons. First, it brought a greater sense of buy-in among those who chose to have gardens. Second, residents roundly agreed that the gardens required too much homeowner care to be left to an unwilling homeowner. There were some exceptional instances in which homeowners got a garden either against their will or as a result of default in making a choice. Focus group participants claim that the result is an obvious lack of motivation, observable in delayed and low-quality planting, as well as lax maintenance. It was suggested that if a garden simply has to go in where it is unwanted, then use only low maintenance plants or leave it as a more familiar grassy swale. It was also suggested that the best approach is to avoid such situations altogether by working as hard as possible to get some definitive answer from every homeowner (1-33:22, 68:47).²

¹There is one exception: one gardener accidentally attended the group of non-gardeners.

²This and all subsequent citations are to time points in the original audio data. The first number indicates whether the data is from the first or second focus group. The second number indicates the time point in the audio data.

“Choice” functioned in these projects on more than one level; in addition to the choice of whether to have a garden, those who opted for a garden were presented with the choice of garden type: shade, low-maintenance, butterfly, etc. This second level of choice was also greatly appreciated by those who opted for gardens, especially those who already enjoyed gardening (1-10:34).

Predicting who will opt for a rain garden

Although leaving to residents the choice of whether to have a garden might appear to make impossible an initial prediction as to where and how many gardens would be installed, the focus groups indicate that at least three characteristics of residents may be relatively good predictors of who will opt for a garden: age, attitudes towards gardening, and whether a resident has a water problem on his or her property.

Age - Regarding age, there was an obvious difference in average age between our two focus groups, with the non-gardeners being on average noticeably older. This observation must, of course, be subject to the qualification that the focus groups were not designed to determine whether residents’ age predisposed them one way or another. This is a question suited to be answered by a survey. Nonetheless, the differences in average age between the focus groups was striking enough to warrant the importance of age as an initial hypothesis. Furthermore, one reason why older residents would be less inclined to opt for a garden is relatively common sense, and in fact came up repeatedly: older residents are disinclined to shoulder the additional maintenance entailed by a garden (2-7:11,35:41,37:04,39:34).

Attitudes toward gardening are also apt to be useful tools to predict who will opt for a

garden. Most of the participants in our group of gardeners characterized themselves as gardeners. What is more, they pointed to their avidity for gardening as one of the main reasons they opted for a garden (1-12:50).

Water problems—Lastly, residents who have experienced persistent water problems on their property—such as standing surface water or basement wetness—are apt to accept a rain garden. These are people who would likely be ready participants in almost any program. Among the focus group participants who had such problems, there was a sense of desperation that *something* be tried, a desperation having grown out of their own unsuccessful attempts to deal with such problems (1- 14:07).

Methodologically speaking, these three factors affecting residents' choices—age, attitudes towards gardening, and experience of water problems—bear emphasis because they are potentially accessible pieces of data that could be used in early planning stages to forecast the extent of acceptance of rain gardens in specific projects. It should be noted, however, that the Maplewood projects did not undertake such an assessment, nor should the present focus group experience be taken as establishing the on-the-ground workability or usefulness of such a preliminary prediction. It is noted here in a *hypothetical* spirit, as a *potential* tool whose practical merits can only be gauged by actual trial. In addition, even were such a tool workable, it should be kept in mind that the resulting prediction would be *preliminary*, not only in the sense of being prior to the actual choices of residents, but also preliminary in the sense of *prior to any presentation of the gardens that might modify how residents assess them*. And as the next section notes, the focus groups reveal potentially fruitful means of convincing residents to opt for a garden.

Who wants a rain garden: a fixed constraint?

The City of Maplewood chose by and large to leave to homeowners the decision of whether to have a rain garden. As we have seen, focus group participants agreed with this approach for several reasons. However, homeowner choice thereby affects an important parameter in the engineering of a community stormwater system. Consequently, it bears emphasis that the question, “Who wants a rain garden?” should not be regarded as a question with an unalterable answer. A municipality contemplating stormwater system utilizing rain gardens could pose this question at the outset of a project and then ask that its engineers work within the confines of homeowner preferences. This approach may be a mistake. The focus groups indicate that in many instances residents are not initially aware of several points of view that might influence their choice, such that to pose the choice to them from the outset would squander the opportunity to expand the points of view impinging on homeowners’ choices. The focus groups indicate several of the vantage points that should be cultivated. These points of view share the general goal of getting participants to think beyond their own properties, to view their decision in relation to a shared problem.

The Maplewood projects in fact took some steps toward enlarging the perspective of homeowners, notably by communicating to residents that infiltrating water locally would beautify the community and save the city money by reducing charges the city must pay for the volume of stormwater it contributes to the Battle Creek watershed. One focus group participant recalled this appeal, but thought it too distant to affect homeowner choices (1-77:53). However, participants found more persuasive the ideas of “helping your neighbor” and getting rid of standing water in the neighborhood (1-77:32).

The idea of helping your neighbor has deep roots in American practice and religious teaching. Of course, rain garden planners shouldn't assume that a spirit of helping one's neighbor is always and everywhere present. However, exchanges between Maplewood focus group participants indicated that what was often lacking was not a neighborly spirit but an understanding of how stormwater moved through the neighborhood, causing problems for some and sparing others. Those without water problems indicated being unaware of how water leaving their property affected others (1-74:12). In short, a neighborly spirit—even if present—is of little effect *unless residents understand how their decisions have consequences for their neighbors*.

This lack of understanding was exhibited both directly—when focus group participants acknowledged having not known what their neighbors suffered—and indirectly when participants discussed their decisions about a rain garden *solely in terms of whether they experienced problems on their property* (2-28:31,37:54). Another way of putting this point is that when residents understand the shared nature of the problem, they are more apt to regard the choice of whether to have a rain garden less as an individual choice. This observation is in no way meant to imply that individual choice be curtailed, only that individuals should be helped to make their choice in light of the shared aspects of the problem. One participant seems to have seen “her” choice from such an extended or community point of view (1-32:08).

The elimination of standing water was noted as another community-level reason for participation in the garden program. Standing water on or next to the street was seen as damaging it and standing water anywhere was seen as breeding mosquitoes throughout the neighborhood (1-78:58). Both gardeners and non-gardeners agreed on the value of eliminating standing water.

On the subject of standing water, although the non-gardeners by definition did not have rain gardens installed on their properties, many still had some form of ditch or grassy depression. These ditches are apparently not draining as well as the rain gardens; only the non-gardeners complained of standing water as a problem persisting even after the project was completed (2-49:41,53:09).

A final reason why who wants a garden should not be regarded as having a fixed answer is the fact that hardly any of the focus group participants had any prior knowledge of rain gardens (2-19:51), and consequently had not had occasion to develop specific attitudes towards them. However, even when officials enjoy such a blank slate of prior experience, residents are still apt quickly to see the proposal of a rain garden in terms of something they already do know. Hence the strong tendency among both gardeners and non-gardeners to evaluate whether to have a rain garden on the basis of whether they saw themselves as gardeners and in terms of the work they associate with gardens generally, whether or not they had specific experience with a rain garden. Another instance of seeing the new idea of a rain garden in terms of something with which residents were already familiar was a fear that using rain gardens meant going back to roadside ditches, which had apparently been in use at an earlier time in one of the communities (1-15:45).

Each of the above points is noted as a potentially useful means to convince residents to choose to have a rain garden. They are ways of responding to what appears to be a common mode of reasoning against having a rain garden: I don't have a water problem, so I don't need a garden. This perspective should not be surprising, people are likely to think in terms of their own property, not only for the obvious reason that they care most about what happens in their

basement but also because they may simply not be aware of the problems suffered by others. To the extent that the educational efforts undertaken at the outset of a project can cultivate a greater appreciation of the problems of others or of the community as a whole, the perspectives from which choices are made about rain gardens can become less individual even as they continue to be made by individuals. Lastly, a broadening of the perspective of individual choices might be most economically pursued if targeted at residents most likely to refuse gardens as identified by the three criteria mentioned earlier.

Living with a rain garden

The unique value of these focus groups is to tap into the experience of residents who have actually lived with and cared for a rain garden. Although none of our participants yet had more than a few years of such experience, they already have issues to report. The three main issues that surfaced were floating wood chips, maintaining the garden edge, and challenges associated with the slope of the gardens.

The problem of wood chips floating when the gardens fill—leaving a “bathtub ring” of chips when the water recedes and requiring that they be raked back in—has already been recognized by the city and has been solved through the use of *shredded* as opposed to *chipped* wood.

The issue of maintaining the garden’s edge was brought up as an important determinate of how the gardens look, as well as a technical challenge, especially when that edge is located where the garden slopes steeply, making mowing at the edge difficult (1-23:03; 2-47:18). When the issue of maintaining the garden edge came up, there was much exchange of tentative ideas

among gardeners, indicating that they are very much still learning how to manage this aspect of the garden. In any case, it appears clear that the steeper the sides of the garden, the more pronounced these maintenance issues become. How, whether and to what extent to minimize the steepness of garden sloping is beyond the scope of the present research, but may be an important area for subsequent study, perhaps by those knowledgeable of the technical functioning of the gardens. Aside from these specific issues, residents who have lived with the rain gardens report that they do not take any more care than other types of gardens (1-49:53).

Although non-gardeners do not live with a rain garden in the sense of having to maintain one on their property, they do have to live with them as functional and aesthetic components of their neighborhood. The non-gardeners concede that the rain gardens function well (2-14:19, 48:53,50:58); most storm water problems have been eliminated and the gardens appear to perform as designed. However, non-gardeners are quick to criticize the gardens as eyesores, either because they are poorly maintained or because they collect trash. At the same time, they admit admiring some of the better maintained gardens (2-36:05) and that the gardens are not the only place litter collects (2-19:13). In any case, non-gardeners are not alone in criticizing poorly maintained gardens; gardeners share this concern. And participants from both groups agree that judgment should be withheld on the look of the gardens until some of the planting have time to mature.

City performance

Overall, the city was roundly commended for how smoothly the whole process was conducted, especially how the city communicated with and treated residents during the process.

This opinion was shared by gardeners and non-gardeners alike (1-28:49,57:46,70:40; 2-15:44,16:18,61:56,62:49). One participant praised the city in the following terms: “When I call down there, I get results. I’m very grateful to Maplewood...I can’t say enough about the engineers at Maplewood”

On the modes of communicating with residents

The city communicated with residents through mailings and community planning meetings. Focus group participants agreed that both these means of communication should be continued, each offering distinct benefits (1-71:18). Deep appreciation was also expressed for on-site visits made by city staff to help diagnose site-specific problems and to explain how the gardens would function (1-71:45). Focus group participants found the City of Maplewood responsive on virtually all counts.

Confusion over voting procedure

Though the planning meetings were deemed useful, participants expressed confusion about the voting procedures that occurred at the community planning meetings, votes they understood to bear on whether the project as a whole would occur at all (2-24:41,65:24). This confusion was not adequately probed during the focus group sessions both because the focus groups were directed to issues immediately surrounding the rain gardens and because the moderator was not familiar with these general voting procedures as conceived by the city. Yet the issue was accompanied by sufficient emotion that it is noted here as one to which the city might want to address itself in the future. It should also be noted that this confusion only arose

among the non-gardners.

One constructive suggestion was made regarding the planning meetings; these meetings might be supplemented by smaller group meetings on the model of the focus group sessions. Participants in the focus groups appear to have appreciated the opportunity for extended discussion offered by the focus group setting.

Initial presentation of rain gardens to residents

Focus group participants reported that the garden brochures, the planning meetings and the invitations to visit completed projects were all useful ways to be introduced to the gardens. Of course, not all municipalities will have the luxury of completed projects at hand for residents to see. But when such an option is available, residents appear quite eager to see an actual installation. If there be a shortcoming to such site visits, it is that residents are apt to appraise what they see only in aesthetic terms, for they are unlikely to visit during foul weather when the gardens are doing their work. Nor are they likely to appreciate the functional aspects of the gardens if they visit them unaccompanied by someone knowledgeable about their functioning. Because functional misunderstandings of the gardens appear prevalent (these misunderstandings are detailed below), the question arises whether casual visits to existing gardens might not usefully be replaced or supplemented with guided tours, during which a functional appreciation of the gardens could be cultivated along with an aesthetic assessment. Of course, organizing such tours is an additional logistical task. Perhaps they could be scheduled prior to the community meetings about the projects. Or perhaps they could be “guided” in a looser sense; explanatory signs might be posted or brochures circulated that “guided” residents through the

functional aspects of the gardens.

Keeping residents informed of what to expect

The rain gardens in Maplewood were installed during a period of road reconstruction. Such reconstruction unavoidably causes many headaches for homeowners, disrupting parking and access to one's home, tearing up the front edge of yards, generating dust and mud, etc. As unavoidable as are these side-effects, our focus group participants broadly agreed that the City of Maplewood did an outstanding job of keeping residents informed of the progress of the project (1-9:58) and in minimizing side-effects to the extent possible. So, for instance, the city was commended for watering down the roadbed to minimize dust and worked with residents to accommodate specific needs. The workmen were also praised for being considerate to residents (1-9:00).

However, with specific regard to the raingardens, one important area of expectation management appears to have been overlooked; some residents were shocked when they saw how deep were the garden excavations (1-22:19; 2-30:02). It appears that when residents envision the rain gardens, they envision them as they will appear in their final state, which is to say as relatively shallow depressions. But as the proper functioning of the gardens requires preparation of the area beneath the garden several times deeper than the final depression, some residents were aghast at the discrepancy between the shallow depression they had imagined and the yawning hole being dug in their front yard. In fact, one focus group participant who had initially opted for a garden changed his mind upon seeing the excavation (2-30:02). This was the only focus group participant who definitively changed his mind about the garden during the course of

the project.

Aid with the gardens

Those who chose gardens appreciated the various stages at which they were aided by the city, including (i) the selection of appropriate plants for their situation (1-10:42), (ii) aid in putting in plants (1-11:03), and (iii) the presence of a master gardener on planting day (1-60:13). They generally felt “there was lots of help” (1-36:03). The gardeners also found that the whole planting process was well organized and that they were kept informed where necessary (1-59:59,60:31). They also liked the range of gardens offered and the quality of the plants supplied, though some found the plants on the small side.

A suggestion was made that during the first summer following planting, guidance be offered during weeding in order that residents solidify their ability to distinguish garden plants from weeds. The problem here seemed to be a combination of inadequate experience with the plants concerned, as well as the small size of the original plants, making them more difficult to distinguish from emergent weeds (1-11:14).

Because so many of the non-gardeners said that it was the *maintenance* of a garden that deterred them from having one, they were asked a hypothetical question: “Would you have opted to have a garden had the city undertaken maintenance?” Some non-gardeners claimed they would have changed their decisions, others would not. This was the second of two hypothetical questions posed to non-gardeners. Recall that non-gardeners reported that water drained poorly from their grassy swales. They were asked whether they would have opted for a garden had they known that it would likely drain better than a grassy swale. *None* of the non-gardeners said this

information would have changed their decision. This difference is an indication of the greater weight of maintenance issues; non-gardeners would surely have been happy to get rid of standing water and avoid moving muddy grass, but that benefit simply was not enough to overcome the anticipated burden of maintaining a garden.

Communicating how the gardens are to function

As has already been noted, the City of Maplewood was broadly credited with communicating well with residents about all manner of issues. Yet even such well-managed communication clearly broke down in one major respect: communicating an understanding of how the gardens were to function. Points of misunderstanding included the following: the operation of the overflow drains, the sizing of the gardens (2-44:16,51:33,70:05), residence time of water in the gardens (2-30:22,48:09), the systematic connectivity of the gardens (1-39:46,41:20), etc.

The operation of the overflow drains was clearly the point of greatest confusion (1-20:26,73:38). Gardeners and non-gardeners alike found the elevated drain pipes violated common sense (1-20:26; 2-4:25,5:23,12:42); they expected a drain to be at the lowest point so the water would run out, as a bathtub or sink drain. The evident problem is that residents were interpreting the garden drains under a false analogy: the analogy is not with the main drain at the bottom of a sink or tub, but with the overflow drain located along the upper slope of a sink or tub. The presence and operation of such overflow drains in everyday living is likely overlooked by many, and so the false analogy to the main, bottom drain is quite understandable.

The functional misunderstanding was in some instances accompanied also by aesthetic

dislike of the garden drains; being elevated, the drains are plainly visible and detract from the beauty of the gardens. The combination of misunderstanding and dislike of the drain poses the question of whether a different type of overflow drain design might address both problems at once: would it be possible to locate the drains flush with the ground, somewhere along the rising slope of the garden where it would serve its overflow function? The benefit of such a design would be not only to eliminate the drain as an eyesore, it would also put the drain in a position analogous to the customary position of an overflow drain in sinks or tubs, perhaps also making it easier for residents to correctly understand the drain's intended function. Whether by redesign or by more explicit and insistent explanation, the focus groups indicate that this misunderstanding ought to be addressed.

The quality of sod

A very common complaint was that the sod supplied by the city was of poor quality. This complaint was voiced by gardeners and non-gardeners alike (1-26:42; 2-2:16,8:34, 15:26, 16:37). The sod was said to be full of crab grass and other weeds, and its installation sometimes left gaps and unevenness.

Although the sod might seem a relatively unimportant matter in reconstruction projects of such scope, it was nonetheless a significant source of dissatisfaction. Sod is after all a conspicuous finishing touch. Furthermore, one participant noted that he had been assured that his lawn would be "at least as good as it was before or better". Violating such expectations deepened the dissatisfaction.

The potluck

Although some gardeners reported being too busy during planting day to attend the potluck, those who were able to attend (including non-gardeners) very much enjoyed the experience, especially getting to see neighbors they had not seen for a long time.

Future research: the problem of homeowner turnover

Only one of our gardens did not actually choose to have the garden; she inherited it when she purchased the property. This class of persons will, of course, grow over time. And even though our single garden “inheritor” had much too narrow a base of experience to speak for this future group, several points arose that indicate some of the directions in which future research and planning will need to venture to address the specific challenges this group will present.

Such garden inheritors are more prone to misunderstand how the rain garden is supposed to operate on his or her property and how it is integrated into the community system of water management. So for instance, our garden inheritor misunderstood the intended function of the overflow drain; she did not understand that the drain was elevated intentionally so as to operate only when the water reached a designated level. She was not alone in this misunderstanding (pointing again to the general need to help residents understand how the gardens are to function). Nevertheless, this type of misunderstanding is surely more likely to arise among those who only come into connection with a garden by way of a home purchase. Concern was also raised that a new homeowner may not be as inclined to maintain a rain garden as the prior owner who expressly opted to have it (2-40:00). Even if they are inclined to maintain it, lack of

understanding of the garden's functioning may make new owners more liable to replace original plantings with plants unsuited to the growing conditions of the garden.

This brief list of issues that will arise with homeowner turnover must be regarded as largely incomplete and speculative. All that is sure is that this issue will loom progressively larger and will likely require new research efforts.

Conclusions

Prior to the present research, the City of Maplewood had already demonstrated the feasibility of installing rain gardens into existing communities. This achievement is already an important finding for those concerned with practical ways to increase stormwater infiltration.

The Maplewood projects relied on voluntary acceptance of such gardens. The present research has helped determine what characteristics determine such acceptance: age, attitudes towards gardening, and whether a resident has a water problem. The first two of these constraints are beyond the influence of a municipality. Older residents in particular seem quite firm in their unwillingness to undertake maintaining a rain garden, not because they find them unattractive (they often do), not because they doubt the gardens' efficacy (they concede they work), but because they know the physical limitations of age and are determined not to overextend themselves. However, it was found that the last constraint is not fixed to the extent that residents can be encouraged to think beyond their own properties to shared problems, especially those impinging directly on their neighbors. How effective such an effort might be can only be determined by future attempts.

The decision in Maplewood to leave so much to homeowner choice did create a variety

of logistical tasks, tasks which the city staff reportedly met with careful organization and open communication. Yet the persistence of misunderstandings, especially with respect to functional aspects of the gardens, points the way to remaining challenges. Among these challenges will be how to educate future homeowners about the gardens and to enlist their willingness to care for them. Our present research was only able to deal with this issue in the most preliminary and speculative of fashions.

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