

Communicating Stormwater Best Management Practices in the Newfound Lake, NH Watershed

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Introduction to Newfound Lake Project Phase Two:

The Center for the Environment (CFE) at Plymouth State University has been involved in the Newfound Lake Watershed Master Plan project since 2008. A watershed plan is often a key component of managing water resources by providing a holistic framework to watershed communities for the application of management tools that meet water resources goals for the entire watershed. As watersheds typically cross town lines, the development of a watershed plan is a collaborative process involving multiple stakeholders.

In Phase I of the project the CFE conducted an initial survey to determine resident's values and desires for the future of the watershed and its environmental characteristics. This survey provided information for stewardship education by asking questions to determine the knowledge base of residents. A follow-up survey in 2009 determined if the watershed planning process resulted in changes in knowledge and the most effective steps to increase stewardship. The data from these studies helped explain the need for watershed planning and the connection between land use, watershed management, and water quality in Newfound Lake.

In Phase II of the project, the CFE has aided the Newfound Lake Region Association (NLRA) and other affiliated projects teams by utilizing existing survey data from Phase I to identify critical communications elements. By using concepts from Community-Based Social Marketing (CBSM), CFE helped gather information for use in developing communications to encourage participation in specific environmentally responsible behaviors to protect water quality.

Introduction to Community-Based Social Marketing:

Community-Based Social Marketing is based upon research in the social sciences that demonstrates that behavior change is most effectively achieved through initiatives delivered at the community level which focus on removing barriers to an activity while simultaneously enhancing the activities benefits. (*Fostering Sustainable Behavior*, Doug Mackenzie-Mohr, 1999) Community-Based Social Marketing involves four steps: 1) Identifying the barriers and benefits to an activity, 2) Developing a strategy that utilizes "tools" that have been shown to be effective in changing behavior, 3) Piloting the strategy, and 4) Evaluating the strategy once it has been implemented across a community.

(*Fostering Sustainable Behavior*, 1999) In Phase II of this project specific areas of the CBSM

framework are being utilized to help promote certain environmentally responsible behavior. As part of this project a major component was to identify target behavior used to promote stormwater Best Management Practices (BMPs) within the watershed. Research indicates that each form of environmentally responsible behavior has its own set of barriers and benefits. In this work, the barriers and benefits associated with participation in specific stormwater BMP were also identified to help most effectively promote the target behavior in the projects social marketing campaign.



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- 4) *Evaluating the strategy once it has been implemented across a community.*

(Fostering Sustainable Behavior, 1999)

Using this Report:

This report was compiled from qualitative data from thirty (n=30) interviews of key stakeholders residing in the Newfound Lake Watershed. The purpose of this data collection was to identify the perceived barriers and benefits to utilizing specific stormwater BMP respondents might use to protect water quality in the Newfound Lake Watershed. Interviews were conducted by phone and in-person during the winter months of December 2010 and January 2011. Key stakeholders included local selectmen, planning board members, members of the NLRA, members/staff from other local NGOs, certain invested business, etc. Interviews were set up to determine specific stormwater BMP that residents would be most likely to utilize. *See appendix for attached interview protocol used for this study.*

Results: Target Behaviors, Barriers and Benefits:

Using the data from these interviews, we were able to identify the top five stormwater BMP that respondents were most likely to use. Although numerous BMPs were identified, five environmentally responsible behaviors were frequently mentioned. The top five stormwater BMPs were: 1) Permeable Pavement/Surfaces, 2) Rain Barrels, 3) Rain Gardens,

4) Water Bars, and 5) Vegetative Buffers. The following section describes the perceived barriers and benefits to each of the top rated stormwater BMPs.

1) Permeable Pavement/Surfaces:

Perceived Benefits: The perceived benefits of the use of permeable pavement/surface on a resident's property related to minimizing the amount of on property stormwater runoff.

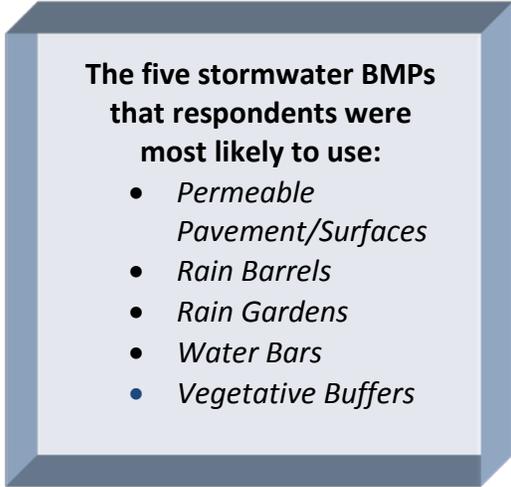
Specific benefits mentioned by respondents included the filtration of runoff, the prevention of washouts/erosion, and the improvement of water quality.

Perceived Barriers: The most commonly perceived barrier to the use of permeable pavement/surface on a resident's property was cost. The majority of respondents indicated that permeable pavement/surfaces were too expensive to install and manage. Other common barriers identified were the lack of knowledge to make an informed decision to install these types of technologies, and lack of motivation to utilize stormwater BMPs on their property as a whole.

2) Rain Barrels:

Perceived Benefits: The most commonly perceived benefit to utilizing rain barrels on a resident's property was the capture and reuse of stormwater. Other perceived benefits mentioned by respondents were the simplicity and low installation costs, and the prevention of erosion and runoff.

Perceived Barriers: The most significant barrier to utilizing rain barrels on a resident's property was the lack of knowledge about this BMP. Other barriers identified were the absence of gutters, installation costs, aesthetics and lack of motivation.



The five stormwater BMPs that respondents were most likely to use:

- *Permeable Pavement/Surfaces*
- *Rain Barrels*
- *Rain Gardens*
- *Water Bars*
- *Vegetative Buffers*

3) Rain Gardens:

Perceived Benefits: The perceived benefits of utilizing rain gardens on a resident's property included the reduction and infiltration of stormwater runoff. Other benefits mentioned by respondents were the low maintenance costs and the attractive aesthetics.

Perceived Barriers: The perceived barriers to utilizing rain gardens on a resident's property were the lack of knowledge and motivation. Numerous residents did not understand the technology well enough to make informed decisions to install rain gardens or they were unmotivated to start this type of project on their property. Other barriers identified, included property limitations, such as homeowner associations that have property restrictions, condominiums with limited land, and properties with steep slopes. Respondents mentioned that the initial cost of installation would be a factor when deciding whether or not to install this technology.

4) Water Bars:

Perceived Benefits: The perceived benefit from utilizing water bars on a resident's property was to prevent erosion from stormwater runoff by slowing and limiting water runoff through diversion of the flow at water bars.

Perceived Barriers: The most commonly perceived barriers to utilizing water bars on a resident's property are the lack of knowledge and motivation. Other top barriers indicated were property limitations such as homeowner associations that have property restrictions, condominiums with limited land and properties with steep slopes. Respondents mentioned that the initial cost of installation would be a factor when deciding whether or not to install this technology.

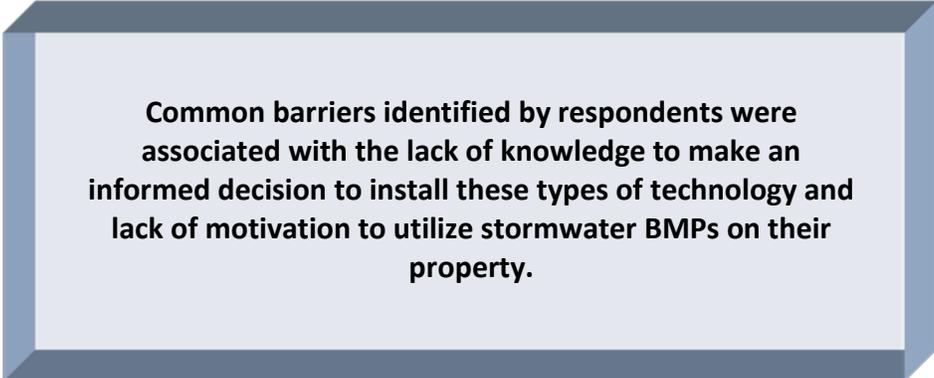
5) Vegetative Buffers:

Perceived Benefits: The perceived benefits of utilizing vegetative buffers on a resident's property were the infiltration of stormwater runoff. Other top benefits were the low maintenance costs, prevention of erosion, shoreline protection and the attractive aesthetics.

Perceived Barriers: The most commonly perceived barriers to utilizing vegetative buffers on a resident's property were the aesthetics and viewshed disruption. Other barriers were competing space uses (such as sandy beaches), and the lack of knowledge and motivation.

Conclusion

While behaviors need to be understood in their individual context, there are several consistent findings across the topics explored. Common barriers identified by respondents were associated with the lack of knowledge to make an informed decision to install these types of technology and lack of motivation to utilize stormwater BMPs on their property. Based on this information, the next step in this communications development process is to apply the tools identified in CBSM with the information collected to develop effective campaigns to stimulate behavior change to protect water quality by specifically addressing these barriers.



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Recommendations – Using Community Based Social Marketing Tools:

There are a variety of tools identified by the Community-Based Social Marketing (CBSM) framework that could be utilized in the Newfound Lake Region Association’s marketing campaign to help promote residents’ adoption of stormwaterBMPs. An important practice to note is that CBSM tools are used to help promote a single target behavior by addressing specific barriers to participation in it and identifying specific benefits of engaging in the practice. In this case, the barriers of lack of awareness of technical aspects of BMPs affecting their installation and an overall low level of motivation to install BMPs need to be addressed.

One social science tool that is gaining popularity in environmental fields is the use of norms, and these concepts can provide an empirically supported means to improve motivation to engage in environmentally responsible behaviors. The normative framing of messages, specifically using a reference group to establish accepted behaviors, has been used in the past to reduce the amount of excess laundry waste in chain hotels. By creating signage that advertises that other guests are reusing towels throughout their stay rather than receiving



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new ones, hotel guests seeing the signage are encouraged to do the same. Studies have shown that normatively framed messages are more effective at stimulating behavioral change than other message forms (such as those touting only water quality benefits, for example). When using norms, it is important to encourage a positive behavior rather than to discourage an environmentally harmful behavior, to cite a meaningful reference group, and to

use public commitments to improve follow-through to taking action. For example, in some social marketing campaigns specific people are identified for their positive contributions to environmentally responsible behavior in a public forum such as a regional newspaper. Using examples of “positive deviance” are part of the NLRA’s work that can provide a forum to create a solid connection with CBSM tools and techniques.

In the Newfound Lake region, normative framing of messages might be used best on the upcoming website and in other forums by lining it with existing data from the earlier studies of residents in the Newfound Lake Watershed. When focusing on the barriers to using stormwater BMPs identified in this report, a normative approach could be used to promote them by citing data illustrating the approval of practices to protect water quality from the regions residents, data available in the previous social science surveys conducted in the watershed.

In addition to these important reference group framings, other practices are useful for employing norms to achieve behavior changes to protect water quality. For example, publicly praising residents who have begun practicing BMPs is a powerful means of ensuring their commitment and encouraging others. This public praise could be accomplished by announcing certain residents on the upcoming website, listing their names in an ad space, praising their efforts in the local news (a strongly recommended action), and/or creating small signage for participant's lawns that indicates that they have chosen to participate in proactive stormwater management. For example, an ad asserting that, "The NLRA and their watershed neighbors thank the following residents for their commitment to ...". In combination, these tools can also be used to enhance the normative influences in efforts to encourage behavior changes to protect water quality.

In order to create an effective normative marketing campaign it may also be useful to identify what people in the community see as frames of reference. Community Leaders, heads of organizations, and key business leaders, are all examples of these opinion leaders whose support may be cited to encourage others. Combining these messages with other efforts, such as public recognition, typically improves their effectiveness.

Another social science tool utilized in CBSM campaigns is the positive use of a commitment strategy, which as mentioned previously can be combined with normative based efforts to stimulate change. Commitment strategies are used to help create a sense of community attachment to a project. This could be best accomplished by setting up a section of the website that allows residents to sign their name and pledge to utilize environmentally responsible behavior and stormwater BMPs on their property when at all possible, or by publicizing their commitment in other public forums.

Many respondents indicated that they had a limited understanding of many stormwater BMPs and were unaware of the methods required to use them properly on their own property. One recommendation to address these needs would be to provide easily accessible, web-based information pertaining to easy do-it-yourself stormwater BMPs. Great examples and information for many of the stormwater BMPs identified in the results of these interviews can be obtained through the online document published by the New Hampshire Department of Environmental Services (DES) titled, *The NH Stormwater Manual*, as well as many UNH Extension publications.

To most effectively address the knowledge barriers public examples and peer education would be excellent starting points. Publicizing not only those who are committed to BMPs, but also examples of what they did can model behavior to others, and in doing so provide a peer reference that may help address knowledge barrier. These efforts should be combined with information delivered in the aforementioned forums, and in combination represent empirically supported first steps to address knowledge barriers to employing BMPs.

Specific Recommendations for the Five Most Common Stormwater Best Management Practices (BMPs):

1) Permeable Pavement/Surfaces:

The major perceived barriers to utilizing permeable pavement/surfaces on residential properties were the financial cost, followed in popularity by lack of knowledge and motivation and issues related to maintenance. One recommendation for promoting this BMP would be to show (via the website) less expensive alternative permeable pavement/surfaces, and to provide other needed information. A demonstration project would also be a powerful way to address this barrier. Throughout the interviews, residents identified permeable pavement as “permeable asphalt”, not mentioning permeable surfaces such as crushed aggregate, open joint pavers, porous turf, porous concrete, etc. It is vital to encourage permeable surfaces which require minimal up front cost and maintenance to help reduce stormwater runoff on watershed resident’s properties.

2) Rain Barrels:

One of the top perceived barriers to utilizing rain barrels on a resident's property was the lack of knowledge of this technology. Other barriers identified were the absence of gutters, installation costs, aesthetics and lack of motivation. To help improve knowledge of this technology it is recommended to project simple "how to" diagram descriptions of rain barrels on the website and to direct watershed residents to the "[New Hampshire Homeowners Guide to Stormwater Management](#) (soon to be published by DES and posted on their website), and to consider organizing and/or creating workshops to convey this information. This will help residents fully understand the simplicity and effectiveness of this technology, and the hope is the information will spread. The use of public commitments and normative techniques would be a solid follow-up to the information efforts. Finally, Numerous residents identified that rain barrels would not be useful on their property due to the absence of rain gutters on their home. Since the installation of rain gutter increases the installation cost of rain barrels exponentially, it is important to recognize and adapt to barriers realistically beyond control. It is recommended that the effort be made to direct these residents towards other technologies such as drip line trenches and permeable stone aggregate to best address the barrier.

3) Rain Gardens:

The top perceived barriers to utilizing rain gardens on a resident's property was the lack of knowledge and motivation. In order to most effectively promote this technology it is recommended to identify and display multiple examples of rain gardens throughout the watershed, and to consider a similar series of actions as is suggested for rain barrels. This will help demonstrate the simplicity and effectiveness of this technology to reduce stormwater runoff.

4) Water Bars:

The top perceived barrier to utilizing water bars on a resident's property was the lack of knowledge and motivation as well as property limitations such as homeowner associations that that have property restrictions, condominiums with limited land and properties with

steep slopes. Respondents mentioned that the initial cost of installation would be a factor when deciding whether or not to install this technology. In order to effectively promote this technology it is recommended to demonstrate via the web site, workshops, and demonstration sites diagrams of proper placements of water bars. It would also be important to identify cost efficient materials to use as water bars to help defray the initial cost of installation.

5) Vegetative Buffers:

The top perceived barriers to utilizing vegetative buffers on a resident's property was the aesthetics and viewshed disruption. These may be perceived, more than "real" barriers so education may be an effective tool for encouraging this behavior. Other top barriers were competing space uses (such as sandy beaches), and the lack of knowledge and motivation. In order to address this perceived barrier it is recommended to compile a descriptive list of different plant species that could be utilized in vegetative buffers, and to show good examples via media and demonstrations. One idea might be an NLRA sponsored "BMP tour" where NLRA members open their properties to others to address misconceptions about this BMP and to establish normative influences on the use of buffers. This type of quasi-social event is often popular among lakefront homeowners who may enjoy sharing the beauty of their property with others. The plant species list should cater to viewshed limitation and should categorize plant species by mature growth height and size. Information should be posted via the website pertaining to spatial use of vegetative buffers so that other competing spaces (such as beaches) are not affected. The UNH Cooperative Extension has several programs and publications that can help achieve these goals.

Conclusion:

Conducting thirty (n=30) in-depth interviews with Newfound Lake watershed residents resulted in the identification of the five stormwater BMPs respondents are most aware of and would consider using. In addition, respondents identified potential barriers and benefits to utilizing these BMPs. By employing principles and tools from the Community Based Social Marketing framework a course of action to best promote these stormwater Best Management Practices has been recommended. Using the perceived barriers as a

structure for the social marketing campaign the use of norms, commitments, other social science tools, and existing data can be used to more effectively promote the use of stormwater BMPs in the Newfound Lake Watershed to protect water quality.

- What could the NLRA or local government do to help residents participate more frequently in these types of activities (utilizing water quality best management practices)?
- Are there any other questions or comments?