Storm Drain Stenciling to Build Stormwater Awareness in NH's Estuarine Communities

A Final Report to

The New Hampshire Estuaries Project

Submitted by

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New Hampshire Estuaries Project

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Executive Summary

Storm drain stenciling is a community-based activity during which volunteers paint stenciled messages on the street next to stormwater grates indicating where the water entering those storm drains discharges. One of the biggest threats to water quality nationwide is stormwater runoff which enters storm drains and flows untreated to local water bodies. The purpose of this project is to educate stenciling volunteers, neighborhood residents and passers-by about the environmental connection between neighborhood streets and local waterbodies.

During the two year period that this project spanned, 12 storm drain stenciling projects occurred in 7 different communities in coastal New Hampshire. During that time, over 600 volunteers contributed over 700 hours participating in projects that resulted in approximately 1330 grates being stenciled. A number of newspapers reported on the projects and one stenciling project was incorporated into a stormwater video produced by a coalition of towns working to spread the word about stormwater pollution. Partly because of the US Environmental Protection Agency's (EPA) Stormwater Phase II requirements, storm drain stenciling is anticipated to remain a popular activity for increasing stormwater awareness in communities. Stormwater awareness through storm drain stenciling is Action Item WQ-19 under the Issue of Water Quality Outreach for the New Hampshire Estuaries Project (NHEP) Water Quality Action Plan and is identified as Highest Priority.

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Introduction

Storm drain stenciling is an outreach tool that has been used around the country to help draw attention to the fact that most storm drains lead directly to locally important waterbodies. Many stormwater contaminants originate from homes, yards, streets and driveways. Some contaminants are deliberately disposed of in storm drains. Many neighborhood residents are under the impression that storm drains are part of the sewer system in their towns and that contents of the storm drain flow to treatment plants where contaminants are removed. Contrary to popular belief, most storm drains are not connected to municipal treatment systems and citizens who would never knowingly dump contaminants into a local water body are contributing contaminants to a local water body. Storm drain stenciling also provides a way to specifically identify little-recognized pollution sources that enter storm drain systems from homes, such as pet waste, automotive fluids, excess fertilizer, pesticides, detergents, yard clippings, litter, and sediments.

Storm drain stenciling projects are usually coordinated by a sponsoring organization, in this case NH Sea Grant, and carried out by community volunteers in conjunction with local Departments of Public Works (DPW). They usually cover several adjacent neighborhoods at any one time. The target audience for this action is residents of estuarine watershed towns particularly those who participate in the actual painting of the messages and those who read them or read about them. Participants are likely to include members of civic organizations, scouts, schools, or clubs. This project anticipated working with at least 300 participants over two years to stencil approximately 1000 storm drains in any of the 43 estuarine towns of New Hampshire (NH) wishing to participate.

Project Goals and Objectives

Goal:

Reduce pollutant inputs into the stormwater system, thereby reducing water quality degradation in New Hampshire's coastal waters.

Objectives:

- Residents and volunteers will indicate an increased knowledge about where local storm drains discharge.

- Volunteers will indicate an increase in knowledge about the origins of polluted runoff.

- Residents and volunteers will indicate reduced use of the storm drain system for yard and household waste disposal.

Methods

Each stenciling project requires the participation of a group of volunteers and the cooperation of the local DPW. The first step is recruiting volunteers and locating communities that wish to have their storm drains stenciled. School children above 4th grade and civic or service groups are frequent volunteers. *See Appendix A.*

In a typical storm drain stenciling project, 20-50 volunteers paint messages such as "Don't Dump – Drains to Bay" at designated storm drains in town. Volunteers, usually in teams of two or three, spread out throughout the neighborhood to clean around the storm drains and paint the stencil. Meanwhile, other volunteers distribute doorhangers in stenciling neighborhoods identifying who they are, what they are doing, ways to protect water quality and where to properly dispose of household and yard waste. *See Appendix B.* The activity usually requires several hours to complete.

The local Department of Public Works usually provides the paint, street sweeping (if possible), safety cones, information about correct disposal of household hazardous waste for that town, a map of the storm drain system when possible and guidance on where to locate the project. The volunteer coordinator often takes responsibility for contacting the media as well as recruiting volunteers and setting up teams. The project coordinator usually provides the stencils, paint brushes, vinyl gloves, customizes the flyer for that town; secures permission from municipal departments to conduct the activity; maintains communication among volunteers and town officials; conducts a presentation on watersheds and nonpoint source pollution to volunteers to provide a context for the activity; and evaluates the activity. The Enviroscape model was used in most of the introductory presentations to help volunteers understand where water pollution comes from and how it is runs off land. In the case of a large adult group, a Powerpoint presentation was created and used. *See Appendix C.*

Results and Discussion

Over a two year period, 12 storm drain stenciling projects were conducted in 7 different communities in coastal New Hampshire. During that time, over 380 youth volunteers and 220 adult volunteers contributed over 720 hours to being educated and educating others about polluted runoff. A number of newspapers reported on the projects and film taken of one stenciling project was incorporated into a stormwater video produced by a coalition of towns working together to spread the word about stormwater pollution. *See Appendix D & E.*

Since each stenciling project involves fairly similar activities, the following results and discussion are meant to describe noteworthy aspects of each community's project that might differ from the usual. They are listed in loosely chronological order. See Table I for more quantitative detail.

Table I

Community	Volunteers	Project Dates	Spry/ Brsh	Youth	Adlt/Tn	Grates	Doorhangers	Vltr Hours
Portsmouth	Middle School	6/19/01	B	30	5	35	?	15
Exeter	High School & ERLAC	5/4/2002	B		27	28	40	18
Portsmouth	Middle School- 8th	5/24/2002	B	44	9	48		27
Portsmouth	New Franklin School – 4th	5/29/2002	B	40	11	40	100	33
Somersworth	Middle School – 5th	5/30-6/1/02	S	120	32	250	400	99
Durham	4H teens	6/26/2002	S		43	115	100	129
Dover	Summer elementary	8/8/2002	B	10	2	7		6
Hampton	H Academy Jr. High – 7/8th	10/17/2002	S	19	10	106	100	95
Exeter	Phillips Exeter Academy	4/16/2003	S		9	158	70	25
Exeter	Rotary presentation	5/5/2003						50
Exeter	Rotary & High School	5/10/2003	S		26	173	120	72
Somersworth	Middle School – 5th	6/13,16,17/03	S	120	26	267	270	93
UNH campus	4H teens	6/25/2003	S		26	103		62
		TOTALS		**383**	**226**	**1330**	**1200**	**724**

Explanation of terms:

Community – refers to the town or entity in which the stenciling project took place.

Volunteers – refers to the origin of the stenciling group.

Project dates – refers to the actual day(s) of stenciling. All groups participated in an introductory lesson about stormwater pollution prior to the stenciling event.

Spray/Brush - refers to whether the group used spray paint or brushed the paint. This decision influences the number of grates a group is able to stencil. Spray paint typically takes less time, but lasts a shorter duration.

Youth - refers to the number of volunteers under high school age. Youth teams are always accompanied by adult volunteers at the rate of 1 adult/2-5 youth.

Adult/Teen – refers to the number of volunteers at or above high school age. These volunteers typically do not require an adult to accompany each stenciling team.

Grates – refers to the number of grates reported stenciled by the volunteers.

Doorhangers – refers to the number of doorhangers distributed by the volunteers.

Volunteer hours – refers to the number of hours contributed by each group of adults or teens participating in the project. Their contributed hours are used to fulfill the match requirement of NHEP's grant program. *See Appendix F*.

Exeter:

Aside from a project coordinator, each stenciling project requires a volunteer coordinator and a public works staff member from the community. These roles are critical to the success of each project. The town of Exeter had the distinct advantage of having a public works staff member, Phyllis Duffy, interested enough in conducting storm drain stenciling that she applied for and received an NHEP grant. Although most DPWs are eager to collaborate on stenciling projects, Phyllis was able to go "the extra mile". Because of Phyllis, we were able to conduct stenciling projects in Exeter on weekends, provide bottled water and t-shirts for volunteers, represent the stenciling project at local festivals, conduct 3 different projects in town and cover many of the high pedestrian traffic areas. Phyllis supplied some of her own stencils which allowed my supply to be used for other projects. Phyllis was also ready and able to collaborate with me in a presentation to 50 members of the Exeter Area Rotary Club. She was able to represent the town's perspective on stormwater issues to this important group of community business leaders.

Exeter's 62 teen and adult volunteers stenciled a total of 359 grates and donated 115 hours to being educated and educating others about polluted runoff. They used both brush and spray paint for different projects. Exeters volunteers came from the Exeter High School, coordinated by Sue Olson, Phillips Exeter Academy coordinated by Mark Trafton and the Exeter Area Rotary coordinated by Bob Mitchell and Rob McGregor.

Photo 1

Photo 2

Portsmouth:

Portsmouth has the good fortune of having two teachers who regularly incorporate information about the local environment into their curricula – one at the elementary level and one in the middle school. These teachers, Ann Smith and Ruth Larkin, include storm drain stenciling in their Spring lessons that center around the South and North Mill Ponds. Both of these coastal urban ponds are affected by polluted runoff and have been the focus of a number of community based efforts to reduce pollution. In 2001 a small group of 8th grade students took on some of the coordination aspects with assistance and created their own doorhangers, wrote an article, and contacted the media.

Portsmouth's mostly student volunteers stenciled 123 grates total through various projects. The accompanying adults donated about 75 hours to being educated and educating others about polluted runoff. Unfortunately, another stenciling project was planned for spring of 2003, but was cancelled because of rain. The Portsmouth teachers have chosen to use brush paint in the past mainly because of the use of younger students and a restricted area of travel for the older students. Portsmouth DPW has had less intense involvement in these projects than some other communities because the projects have been largely teacher-led and cover only a limited number of the city's storm drains.

Somersworth:

Somersworth is one of New Hampshire's most densely populated communities and is specified in the Memorandum Of Agreement with NHEP as an especially important community for this educational activity. Somersworth is another community whose DPW and city engineer, David Foster, have been very involved in the stenciling project. They have been particularly helpful by planning suitable neighborhoods for stenciling, providing maps of the neighborhoods for each stenciling team, providing human power to assist teams on the ground and driving around during the activity to be helpful to volunteers. Somersworth also has a middle school teacher, Leslie McRobie, who coordinates the single largest group of student volunteers - 120 fifth graders! The project typically spans 3 days and requires the recruitment of the largest number of adult volunteers which she and her colleagues have consistently accomplished.

Somersworth's mostly student volunteers stenciled 517 grates in the past two years! The accompanying adults, mostly teachers and parents, donated 192 hours to being educated and educating others about polluted runoff. Each year, each fifth grade teacher has also given up one class period each for the students to participate in an in-classroom, activity-based lesson about polluted runoff prior to the stenciling day.

Photo 3

Durham:

Stenciling projects in Durham have also had the strong support of an active DPW. Mike Lynch, was one of the first DPW Directors in the area to express an interest in stenciling. Unfortunately a project was planned early on in the life cycle of the grant and had to be cancelled because of sudden changes for the volunteer coordinator. However, another opportunity presented itself in the summer of 2002 during the 4-H Teen Conference. The teens typically do service activities during one day of their week-long conference. Durham DPW helped determine appropriate areas for the teens to stencil and supplied materials and support on one of the hottest stenciling days on record!

A group of 43 teens and chaperones attending 4-H Teen Conference at the University of New Hampshire (UNH) stenciled 115 grates. The teens and their chaperones donated about 129 hours to being educated and educating others about polluted runoff.

The Durham project was unique in that it was filmed and became part of the Stormwater Coalition's video, *Stormwater Runoff: There is No Away*. The stenciling segment of the storm water video has been shown on television and at public events, such as hockey games held at UNH's Whittemore Center.

Dover:

A small project occurred in Dover as a result of an inquiry by a couple of teachers involved in summer enrichment programs at Dover Middle School. The students were young (2nd and 3rd grade), so I was reluctant to do a stenciling project off site. Nonetheless, the young students participated in educational activities about polluted runoff and stenciled grates in the school parking lot. The two adults and ten children stenciled 7 grates.

Hampton:

Seniors at Winnicunnett High School are required to do a service project as part of their Senior Seminar. I was contacted by one of the students who had learned about storm drain stenciling from the newspaper. He was interested in the possibility of making a stenciling project part of his Senior Seminar. After several meetings, phone calls and inquiries, we created a plan by which he, Mike Hopkins and a classmate, Ryan Buddenhagen would coordinate a stenciling project to be carried out by Junior High School students. Fortunately, Hampton Academy Junior High has an Enrichment Coordinator, Cheryl Rotondo, who was very enthusiastic about the idea. Cheryl was instrumental in recruiting students and gaining the support of other teachers who would be affected by the stenciling project. I worked with Mike and Ryan to do the coordinating role that I usually do for the project.

With some guidance, Mike and Ryan were able to accomplish a project with a select group of student volunteers and additional adults to stencil 106 grates. Because of the large number of hours they invested in the coordination of the project, Hampton's adult and teen volunteers contributed about 95 hours to the project.

Another project was scheduled for Hampton for spring of 2003, but had to be cancelled because of rain. That project had already attracted the attention of New Hampshire's Department of Environmental Services and an environmental consultant who was working with Hampton on their stormwater management plan. Both professionals were invited to the planned event.

University of New Hampshire (UNH):

The University of New Hampshire qualifies as an MS4 in terms of EPA's Stormwater Phase II. As such, the University is responsible for complying with the 6 requirements of a stormwater management plan, two of which refer to public education and involvement. During the late Spring of 2003, I was contacted by the University's Director of Environmental Health and Safety, Brad Manning, who was on a committee to work on their stormwater plan. He was aware that I was coordinating stenciling projects in Seacoast communities and invited me to meet with committee members to develop a stenciling project. Since college students were no longer on campus we needed a group of volunteers to carry out the stenciling. From past experience, I knew the 4H Teen Conference would be meeting in late June at the campus and offered the service project to the Teen Conference coordinators.

The stenciling project we carried out on UNH's campus was like no other in the quality of maps that were available for the stencilers and the professional investment from various University departments in the project. The maps were the result of dedicated GIS work, done by Peter Tardie, who is mapping the University's stormwater system. Satellite images of photographic quality showing each grate were distributed to the volunteers on stenciling day. *See Appendix G.* As with many communities, stenciling is one component of a broader University plan that will include other education and outreach activities. Twenty-six teen and adult volunteers stenciled 103 grates. Professional time contributed to this project likely exceeds 60 hours.

Photo 4

Evaluation results:

While there is a body of evaluation information from other states about the impacts of storm drain stenciling, our own evaluation was not what we anticipated. We originally planned to conduct short surveys of residents, volunteer coordinators and DPW partners. Because of the barriers indicated below, I now anticipate surveying project partners from many communities, but residents in only one community that had several stenciling projects. According to research conducted at the University of Wisconsin[1] on the effects of storm drain stenciling, the following results can be expected.

1. Stenciling projects increase awareness that storm drains discharge to nearby waterways.

2. Stenciling projects are more influential than television, direct mail, conversations with neighbors or agency representatives in raising awareness of general storm water issues. Newspaper coverage of stenciling events increased awareness more than the stenciled messages themselves.

3. The presence of a message raised awareness of storm drains in a broader area than just the intended neighborhood. "In fact, 67 % of the residents surveyed in the unstenciled neighborhood thought they had seen a stenciled message near their home despite the absence of stenciled storm drains in their area."

We experienced a number of barriers to conducting our own resident surveys. These included:

- Creating a survey tool that was specific enough to provide relevant information and generic enough to be available up to the last minute when most stenciling projects are confirmed because of weather. The cost of printing surveys with specific geographic references and return dates is lost if the project is cancelled.

- Concern that the campaign might not have a large enough impact because most of the stenciling projects were single day events confined to several neighborhoods and we would not know until that day if a reporter would cover the event.

- Creating a survey that was easy, motivating and relevant for residents to return considering a limited storm water education campaign.

Because projects have been conducted up to the time of this report, the formal surveys of project coordinators and DPWs will have to be conducted in the coming months. Phyllis Duffy of Exeter and I are talking about conducting a resident survey in Exeter because there have been a number of stenciling projects there possibly resulting in a more iterative effect.

Conclusions

Coordination, early planning, flexibility and partnerships are integral to successful storm drain stenciling projects. The project coordinator, the volunteer coordinator and the public works departments all contribute to creating an effective event. Staff members of departments of public works are not outreach or education specialists. They welcome partnerships with educational institutions to fulfill the requirements of Stormwater Phase II. Potential volunteer coordinators are often seeking a community-based service project, but do not necessarily have the time, funds or expertise to design the project and carry it out. The project coordinator has the ability to bring the parties together and manage the details of executing the stenciling project.

Flexibility is important because it helps projects meet curricular, community, regulatory, or capacity needs of the partners and volunteers. With enough prior planning, stenciling projects can be adapted to meet some of those needs. See community descriptions in the Results and Discussion section of this report.

Because of its hands-on, concrete educational value, the existing impact research, and EPA's Stormwater Phase II requirements, storm drain stenciling is anticipated to remain a popular activity for increasing stormwater awareness in coastal communities.

Recommendations

For project coordinators:

1. Provide plenty of time ahead of the first stenciling season for recruiting volunteers.

We had a hard time recruiting volunteers initially and had to request an extension to the grant in order to fulfill the numbers of volunteers we had identified in our proposal. Recruiting volunteers is time consuming and most volunteer coordinators need months of planning in advance. Many of our most willing volunteers are recruited from previous project participants.

2. Consider evaluation audience and methods carefully. See discussion of Evaluation Results above. If considering mail-in replies, prepare to use business reply return when possible.

3. Storm drain stenciling in the Northeast is greatly affected by weather.

The stenciling season in northern New England is short and always subject to last minute changes. The weather must be dry and above 50 degrees F in order for the paint to dry. Prepare the volunteer coordinator to have alternative plans and plan a raindate whenever possible.

4. Be open to unexpected opportunities!

We were able to reach an audience, a Rotary Club, that we might not ordinarily reach by pursuing a project with them once notified that they were seeking a service project. In response, a short Powerpoint presentation to educate them about the stenciling program and recruit volunteers was developed. This presentation could be used in the future as an additional recruitment tool.

5. Have an article and photographs handy to give to local media.

Even though a reporter has been notified about the project, they may or may not be able to cover the story. Many local papers are happy to print an article that is already written if the project coordinator provides it.

For communities:

6. Seek partnerships with educational institutions to assist with outreach, education and public involvement requirements of Stormwater Phase II requirements.

7. Remember the point!

To many public works staff members, the activity will seem like a less-than-efficient way to get a street painting job done. It is! The point is not limited to having the storm drain stenciled. It would probably take DPW staff members less time to paint the messages themselves. On the contrary, the purpose of the activity is to get the message across via the activity itself, the ripple effect among volunteer family members and neighbors, and any news coverage. Stenciling is part of a larger stormwater management effort which also includes mapping the stormwater system, communicating with the press, having appropriate disposal services for household waste, etc.

8. Good maps are critical.

Volunteers need to know exactly what area they are responsible for and where to go. When possible, maps of the grate locations are particularly helpful. Such maps help determine how many volunteers, how much time and what quantity of supplies are needed to cover a particular area.

For volunteer coordinators:

9. If working with youngsters, preassign them to an adult volunteer in teams.

10. Ask adult volunteers to arrive at the site early for training.

11. Take advantage of your media contacts if you have them.

References

1. Packer, Pamela and Robin Shepard. 1999. Storm Drain Stenciling: Impacts on Urban Water Quality. University of Wisconsin Cooperative Extension. Madison, WI

Appendices

A. Recruitment flyers for teachers attending Science Teachers Conference and direct mail.

B. Examples of doorhangers.

C. Powerpoint presentation on Storm Drain Stenciling delivered to Exeter Area Rotary members.

D. Examples of newspaper articles

E. Stormwater Coalition's video jacket cover, *Stormwater Runoff: There is No Away*.

F. Volunteer documentation

G. UNH GIS storm water system map