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Erosion & Sedimentation Control Law

A report to the
121st Maine Legislature



Cumberland and Kennebec County Soil and Water Conservation Districts compiled this report under the direction of the Maine Department of Environmental Protection

January 2004

Acknowledgments

Thank you to all who assisted with the Erosion & Sediment Control law survey:

Maine Department of Environmental Protection
Portland Water District
Kennebec County Soil and Water Conservation District
Cumberland County Soil and Water Conservation District

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Executive Summary

The Erosion and Sedimentation Control Law (E&SC Law) requires that a person who conducts an activity involving filling, displacing or exposing earthen materials (except for agricultural fields) take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource. Erosion control measures must be in place before an activity begins, and remain in place and functional until the site is permanently stabilized. For property with a chronic erosion problem resulting from human activity undertaken before July 1, 1997, the law will apply on and after July 1, 2005, if the property is subject to erosion of soil or sediment into a protected natural resource, and located in the watershed of a body of water most at risk (as listed in Ch. 502 of DEP rules). Such property must be properly stabilized to prevent further erosion. All other property subject to such erosion of soil or sediment into a protected natural resource must be stabilized by July 1, 2010.

The 116th Maine Legislature directed the Maine Department of Environmental Protection (MDEP) to evaluate the past and projected compliance of the E&SC Law and to provide recommendations regarding staffing requirements to ensure compliance with this law. To evaluate current and past compliance, staff from the MDEP, Kennebec Soil and Water Conservation District, and Cumberland County Soil and Water Conservation District surveyed 810 construction sites located in 88 municipalities throughout Maine from May to October of 2003. The use of Best Management Practices (BMPs), and their effectiveness, as well as other characteristics of each site were recorded.

Construction Sites were deemed in **compliance** with the E&SC Law if:

- they had BMPs properly installed on-site, and
- there was no evidence of soil movement off-site.

Construction sites were deemed **not in compliance** with the E&SC Law if:

- there was evidence that soil had moved off-site or
- BMPs were improperly or not installed, and there was a potential for soil to move off-site.

Findings:

This survey found that 56% of all of the construction sites surveyed were in compliance with the E&SC Law at the time of the survey.

Other findings:

- **Construction Type:** Residential construction (54%) and "other" types of construction (53%) were less likely to be in compliance than commercial (62%) and road construction (67%).
- **Size of Construction:** The smaller the site, the more likely for it to be in compliance with the E&SC Law.
- **Slope of Construction:** The flatter the site, the more likely for it to be in compliance with the E&SC Law.
- **Proximity to Natural Resource:** Sites that were close to a natural resource were less likely to be in compliance (53%) compared to sites that were far from a natural resource (59%), even though the closer sites were more apt to use BMPs.
- **Type of Natural Resource:** Sites near a freshwater wetland were less likely to be in compliance (31 %) compared to sites near lake resources (69%).

Future Compliance:

Based on watershed surveys in four “most-at-risk” lake watersheds, in which 363 sites with significant erosion were found, it was estimated that there are over 3000 sites with chronic erosion problems in "most at risk" watersheds. These sites will be subject to enforcement of the E&SC Law as of July 1, 2005.

Recommendations:

Education & Outreach: Improve Public Education. The survey findings indicate that more needs to be done to educate the public about soil erosion. The Department has spent nearly \$200,000 through the Federal Nonpoint Source Grants Program since 2000 on a campaign to build public awareness about the problem of soil erosion. However, the Department needs to continue or increase its efforts, including information about the E&SC Law requirements. To accomplish this, the Department should:

- Buy media time to get message out, as resources allow;
- Publish a brochure and make it available through town offices and equipment rental locations; and
- Enlist support of other organizations, including municipalities, through the stormwater program, Soil & Water Conservation Districts, and citizen groups such as lake associations.

Training & Technical Assistance: Increase the number of certified contractors and evaluate the need for mandatory certification. The Department estimates that 10% of excavation contractors are currently certified on the use of proper erosion control practices through its voluntary Contractor Certification Program. This past summer’s survey showed that sites where certified contractors are employed are much more apt to be in compliance with the E&SC Law. Over 90% of sites with certified contractors were found to be in compliance. The majority of sites without certified contractors were found to not be in compliance. The Department should continue to offer annual training opportunities to contractors involved in earth-moving work. The Department should also evaluate whether the program should become mandatory at some point in the future.

Enforcement & Compliance: Focus compliance on 5 “most-at-risk” watersheds each year. The Department should continue to track compliance activity associated with the E&SC Law. The Department should target at least five of the “most at risk” watersheds annually for more targeted education and outreach work, municipal code enforcement officer training and follow-up inspections, including both new development and chronically eroding sites.

Introduction

The Erosion and Sedimentation Control Law (E&SC Law), Title 38 MRS §420-C has been in effect since 1997 (see Appendix A for full copy of law).

In 1998, the Maine Legislature amended the E&SC Law by including the following language:

A person who owns property that is subject to erosion because of a human activity before July 1, 1997 involving filling, displacing or exposing soil or other earthen materials shall take measures in accordance with the dates established under this paragraph to prevent unreasonable erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8. Adequate and timely temporary and permanent stabilization measures must be taken and maintained on that site to prevent unreasonable erosion and sedimentation. This paragraph applies on and after July 1, 2005 to property that is located in the watershed of a body of water most at risk as identified in the department's stormwater rules adopted pursuant to section 420-D and that is subject to erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8. This paragraph applies on and after July 1, 2010 to other property that is subject to erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8.

As part of the same legislation, the following report requirement was established: By January 15, 2004, the Department of Environmental Protection shall submit a report to the joint standing committee of the Legislature having jurisdiction over natural resources matters regarding compliance with the Maine Revised Statutes, Title 38, section 420-C. The report must evaluate past and projected compliance with the erosion control laws and may include recommendations regarding staffing requirements necessary to ensure compliance with section 420-C.

The following report looks at erosion from two sources—erosion associated with construction occurring between May and October of 2003 throughout the state of Maine and chronic erosion issues in watersheds most at risk for development.

MDEP contracted with the Cumberland and Kennebec Soil and Water Conservation Districts to carry out a survey that would look at BMP use and compliance with the E&SC law.

Best Management Practices

The compliance survey was designed to evaluate the use of “Best Management Practices” (BMPs) on construction sites throughout Maine.

Construction site BMPs are designed to prevent soil from eroding into a water resource and generally fall into two categories: erosion control and sediment control BMPs.

Best Management Practices or BMPs: Conservation measures that have been determined to be the most effective and practical means of preventing or reducing erosion and nonpoint source pollution.

Erosion control BMPs prevent soil particles from being dislodged by the force of raindrops, or simply keep soil from moving off site and into a resource. Sediment control BMPs keep soil particles that have already started to move from moving further by intercepting and retaining them at the down gradient side of disturbed or unprotected areas.

Each site was inspected for the presence of BMPs commonly used on construction sites. The following information is provided to instruct the reader on commonly used BMPs.

A **sediment barrier** is a temporary barrier installed across or at the toe of a slope.

- Its purpose is to intercept and retain small amounts of sediment from disturbed or unprotected areas.
- Sediment barriers may consist of filter fence, straw or hay bales, a berm of erosion control mix, or other filter materials.



Silt fence

Properly installed **hay bales** should be placed in a trench, backfilled, and then secured in place with stakes.

The picture at left shows **silt fence** that has been properly “keyed in”, which requires digging a trench, inserting the toe of the silt fence in the trench, and then backfilling.



Hay bales

Temporary mulching is the application of plant residues or other suitable materials to the soil surface.



This picture shows a roadside ditch that has been lined with temporary mulch.

- Its purpose is to prevent erosion by protecting the exposed soil surface and to aid in the growth of vegetation by conserving available moisture, controlling weeds, and providing protection against extreme heat and cold.
- Mulches can also protect the infiltration rate of the soil, prevent soil compaction, and provide a suitable microclimate for seed germination.
- Hay is used most commonly, but erosion control blankets or erosion control mix are also effective mulches.

Erosion Control Mix is a new concept that works best if the source material is from woody debris and elongated in nature. The material needs to contain a small portion of soil to add stability and strength.



Erosion control mulch is applied here as a permanent mulch that will be a long-term cover to provide good buffer around a disturbed area.

- As a sediment barrier, erosion control mix detains and filters water.
- As a temporary mulch, it provides a reliable stabilization measure on disturbed areas and works well for over wintering stabilization.
- As a permanent mulch, erosion control mix can be used as a permanent ground cover, or left to naturalize. It is not designed to support grass vegetation, but legumes or woody vegetation may be established to add stability.

Vegetation can be used for temporary or permanent site stabilization.

- Vegetation is used for temporary site stabilization by stabilizing disturbed areas that will not be brought to final grade for a year or less and to reduce problems associated with mud and dust production from exposed soil surface during construction.
- Permanent vegetative cover can be established on disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil, to reduce damages from sediment and runoff, and to enhance the environment.



This ditch has been lined with grass to provide a permanent vegetative cover.

Other forms of erosion and sediment control BMPs used on construction sites are; geotextiles and erosion control blankets, manufactured soil reinforcement measures, temporary check dams, riprap slope stabilization, and/or vegetated buffers.

Further information concerning this subject may be obtained from the *Maine Erosion and Sediment Control BMP Manual*, March 2003, Maine DEP, <http://www.state.me.us/dep/blwq/docstand/escbmps/index.htm>.

So what is erosion? Soil erosion is the detachment of soil particles and loss of soil from an area by the action of water, ice, gravity or wind. While natural erosion has been occurring constantly at a slow rate since the earth was formed, accelerated erosion can occur because of disturbances by people. In order to prevent erosion, or to control it when it does occur, it is important to understand the sequential processes involved: raindrop impact, sheet flow, rill and gully formation.



Raindrop erosion occurs when raindrops fall and their impact dislodges soil particles and splashes them into the air. The dislodged soil particles can then be easily transported great distances by the flow of surface runoff.

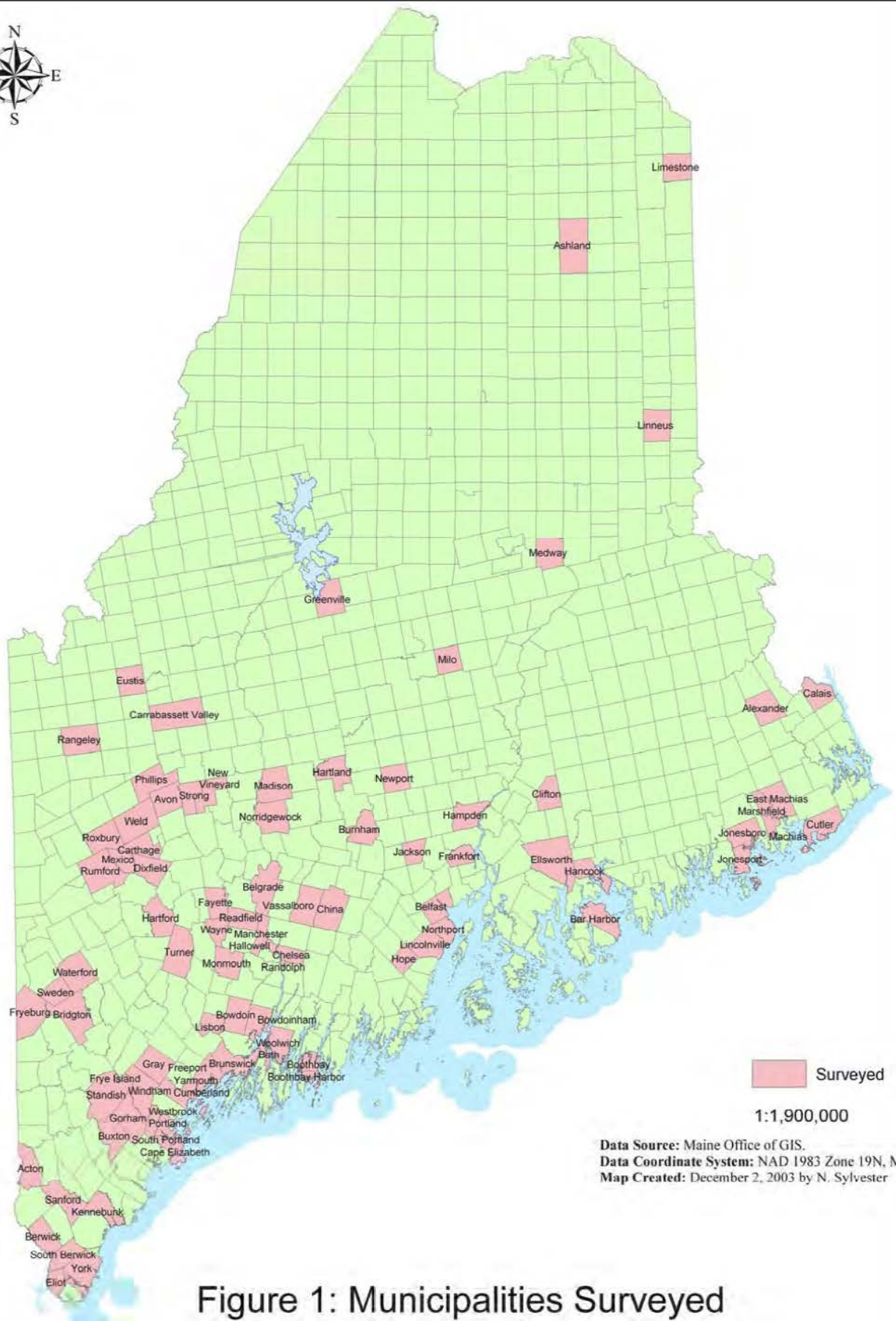


Sheet erosion occurs when the action of raindrop splash and runoff remove a layer of exposed surface soil. The water moves as broad sheets over the land and is not confined to small depressions.



Rill and gully erosion occurs as runoff flows and concentrates in rivulets cutting several inches deep into the soil surface. These grooves are called rills. When rills are not repaired, gullies develop.





Compliance Survey Methodology

In 2003, the Maine Department of Environmental Protection (DEP) contracted with the Kennebec County Soil & Water Conservation District (KCSWCD) and the Cumberland County Soil & Water Conservation District (CCSWCD) to assist in conducting a survey of land use activity in order to determine compliance with the E&SC Law.

The survey was conducted from May through October 2003 and involved staff from the DEP's Division of Land Use Regulation and Division of Watershed Management, staff from KCSWCD and CCSWCD, as well as staff from the Portland Water District. Surveyors were assigned two to four towns and were instructed to spend approximately one day per town. All totaled, 810 construction sites in 88 municipalities (see Figure 1 opposite page) were surveyed.

The survey was designed to gather the information needed to determine whether each site was in compliance with the E&SC law. General information such as the type, size and slope of each site was recorded. The use of BMPs on each surveyed site was rated as:

- appropriate use
- needs improvement
- improper use
- BMPs not applied
- BMPs applied after the fact

In some instances, surveyors did not select one of these options, so these have been recorded as no answer.

BMP effectiveness was rated as:

- negligible soil erosion
- some erosion, but not off-site
- minor soil erosion off-site
- soil movement into resource.

Again there were instances where surveyors did not select one of these options, so these have been recorded as no answer.

All surveyors who were enlisted to assist with this process were provided with survey forms (Appendix A) and instructions (Appendix B). Surveyors either drove each road in the assigned town or contacted the Code Enforcement Officer for a list of permitted projects and addresses.

Compliance Survey Results

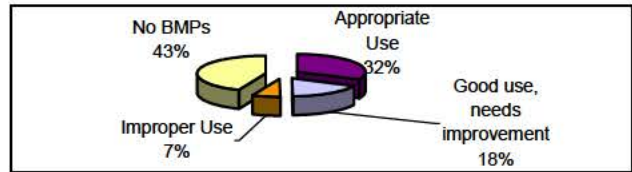
The following details the highlights of this survey. A more comprehensive account of the data can be found in tabular form in Appendix C.

- A total of 810 construction sites were inspected.

BMP USE

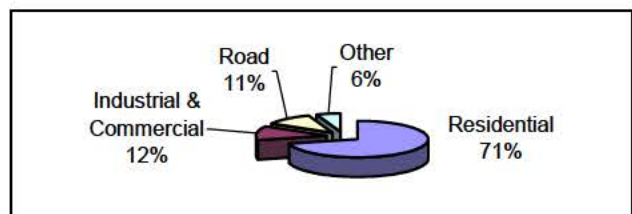
Overall BMP Use

- 43% of all sites had no BMPs in place.

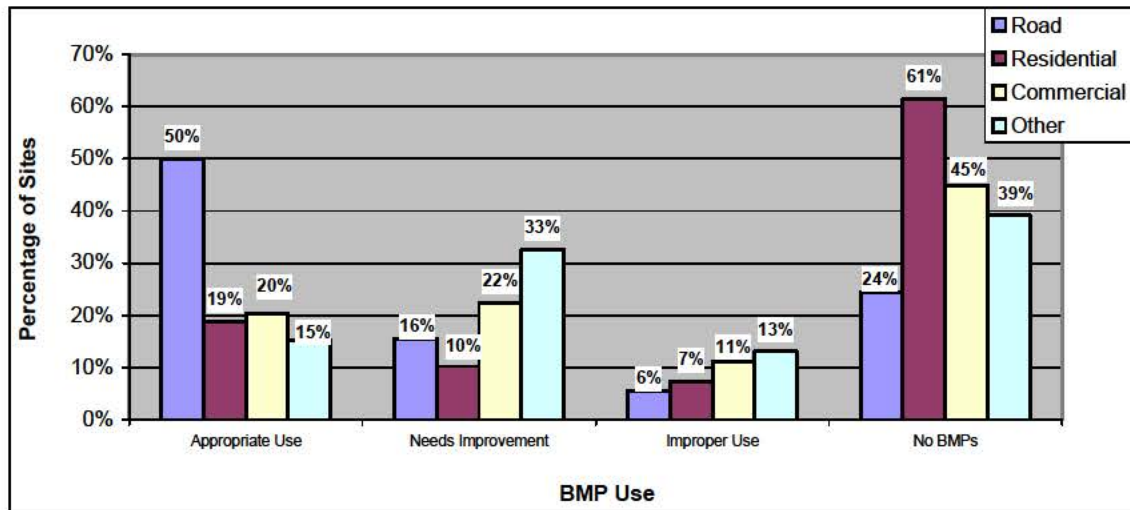


Type of Construction Site

- 71% of the construction sites were residential
- 12% were commercial or industrial
- 11% were roads
- 6% were “other” project types



Construction Type



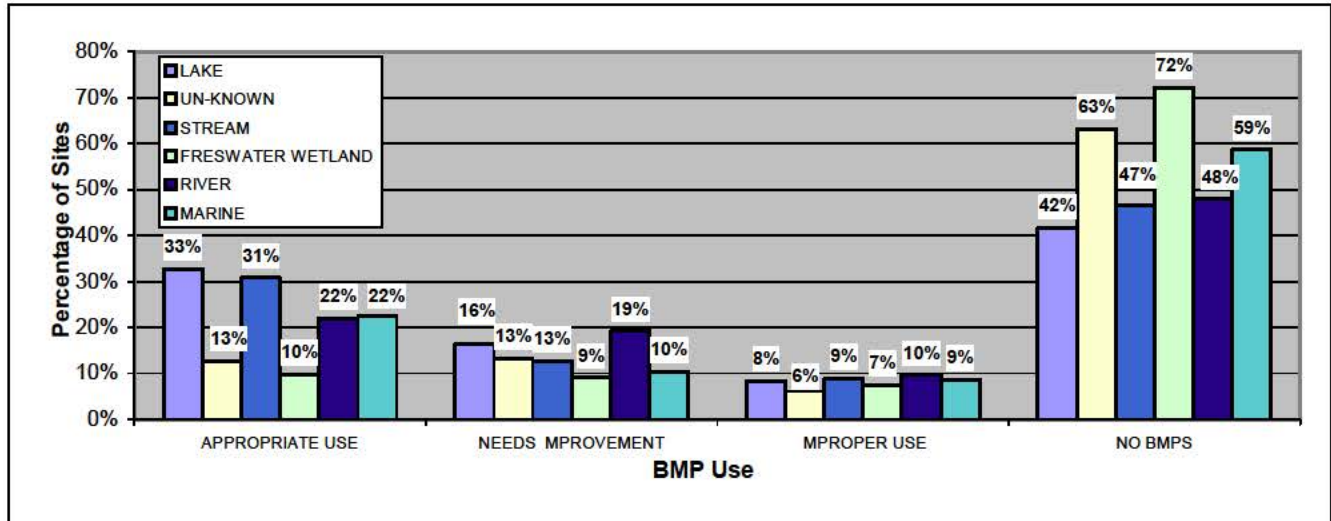
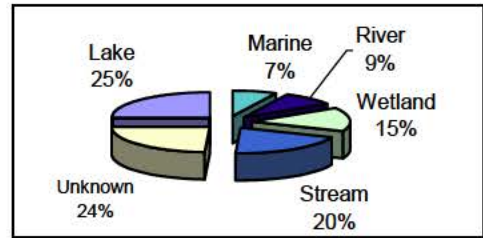
- Road sites (50%) were more likely to have used BMPs and used them correctly, then the other types of surveyed sites.
- BMPs were least likely to be used on residential sites; 61% of these sites had no BMPs in place.

Size of the construction site

- 12% of the surveyed sites were greater than one acre.
- 26% of the sites were 10,000 square feet to one acre.
- 32% of the sites were less than 5,000 square feet.
- 40% of all surveyed sites were 5,000 to 10,000 square feet.
- Sites greater than one acre were more likely to have used BMPs than the smaller sites.

Watershed Type

- The type of natural resource watershed that sites were located in varied, as can be seen in the pie chart at right.



- There were a higher percentage of sites without any BMPs found on sites that were near a freshwater wetland (72%) or where the natural resource was unknown (63%).

Proximity to a Natural Resource

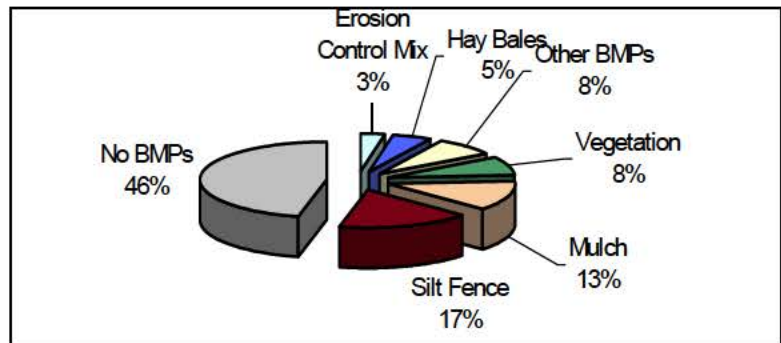
- Proximity to the natural resource showed that the closer the construction site was to the resource, the more likely it was that BMPs were used.

Slope of Site

- 66% of the flat sites did not have BMPs in comparison to 47% of both the moderate and steep sites.

Types of BMPs

- Where BMPs are used, silt fence and mulch are the most popular.



Pictured at left is an improperly installed silt fence. The bottom four inches of the fence should have been “keyed in,” such that a trench should have been dug out, the toe of the fence installed in the trench, and then backfilled.


COMPLIANCE


Construction Sites were deemed in **compliance** with the E&SC Law if:

- they had BMP's properly installed on-site, and
- there was no evidence of soil movement off-site.

Construction sites were deemed **not in compliance** with the E&SC Law if:

- there was evidence that soil had moved off-site or
- BMPs were improperly or not installed, and there was a potential for soil to move off-site.

	<h3>Compliance</h3> <ul style="list-style-type: none">• Ditches are designed to carry water, so they are sloped to convey water.• The ditch pictured at left has temporary check dams and mulch to prevent erosion.• Thus, measures have been taken to prevent unreasonable erosion of soil or sediment into a protected natural resource, which makes this site compliant with the E&SC law.
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<h3>Non Compliance</h3> <ul style="list-style-type: none">• Ditches are designed to carry water, so they are sloped to convey water.• The ditch pictured at right does not have any BMPs in place.• Thus, no measures have been taken to prevent unreasonable erosion of soil or sediment into a protected natural resource, so this site is noncompliant with the E&SC law.	
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Overall Compliance

- Out of the 725 surveyed sites¹ where there was enough information to determine compliance, 56% (408 sites) were in compliance.

Construction Type

- Compliance ranged from 53 to 67% of the surveyed sites based on the type of project (i.e., road, residential, commercial or other).
- Compliance on other construction type (53%) and residential (54%) were the lowest and commercial (62%) and road (67%) the highest.

¹ There were 85 survey reports that did not provide enough information to determine if the site was in compliance. Thus, these have been excluded from all analysis of compliance, but this data is presented in tables in Appendix D.

Size of Construction

- Sites that were less than 5,000 square feet were in compliance 69 % of the time.
- Sites 5,000 to 10,000 sq ft were in compliance 50 % of the time.
- Sites 10,000 sq ft to one acre were in compliance 51% of the time.
- Sites greater than one acre were only in compliance 52 % of the time.

Slope of Construction

- Flat sites were in compliance 85% of the time.
- Moderately sloped sites were in compliance 37% of the time.
- Steeply sloped sites were in compliance 35% of the time.

Proximity to Natural Resource

- 53% of sites that were close to a natural resource were in compliance.
- 59 % of sites that were far from a natural resource were in compliance.

Type of Natural Resource

- 31 % of sites near a freshwater wetland were in compliance.
- 69 % of sites near lake resources were in compliance.

The picture at right depicts a common scene throughout Maine—soil eroding off a residential development site.

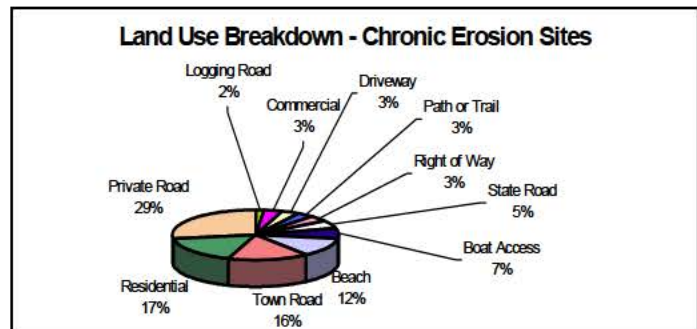


Projecting Future Compliance

In 2005, sites that were disturbed prior to July 1, 1997 will become subject to the E&SC Law in “most at risk” watersheds as established in DEP’s stormwater rules (DEP Rule Chapter 502). There are 234 lakes listed as most at risk in Chapter 502. In addition, there are two streams and seven coastal wetlands listed as “most at risk.”

In order to project future compliance with the E&SC Law, watershed survey data¹ was evaluated for four lakes² that are designated as most at risk.

- The watershed size of these lakes ranged from 1.7 to 13.3 square miles.
- The range of chronic erosion sites per watershed was 0—35 sites, with an average number of 16 chronic erosion sites per watershed.
- Assuming the sample of lakes evaluated is representative of the entire population of the 234 “most at risk” lakes, and also assuming that none of these sites have been fixed, the estimated number of sites that will be out of compliance as of July 1, 2005, will be over 3,000.



Since 1989, 49 (21 %) of the 234 lake watersheds deemed most at risk have had a survey conducted to identify erosion sources from the direct watershed. Many lake and pond associations carry out watershed surveys as a first step towards correcting erosion issues throughout their watersheds. Thus, many of the watersheds surveyed identified chronic erosion sites have implementation work planned, if not already completed. This would lower the number of eroding sites in those watersheds.



Typical chronic erosion site

This is steeply sloped private, gravel road that dead ends into a boat launch to a lake. The gullies pictured here are a typical scene every spring. Also typical are the multiple loads of gravel that are applied each year to make this road accessible to the homeowners.

¹ Watershed survey methodology—The primary purpose of watershed surveys is to identify, document and prioritize existing sources of polluted runoff, particularly soil erosion. Surveys are conducted by volunteers with the help of trained technical staff. Volunteers are trained on survey techniques and erosion identification during a two-hour classroom workshop. Following the classroom training, the volunteers and technical staff spend the remainder of the day in the field documenting erosion on the roads, shoreline, streams, and foot trails in their assigned sectors using cameras and standardized forms. The volunteers then work together to complete their sectors. Technical staff conduct follow up examinations of sites to verify data accuracy.

All documented sites are rated for their relative impact to water quality. Impact is based on slope, soil type, amount of soil that is eroding and proximity to water or ditch. Low impact eroding sites are those with limited soil transport off-site. At medium impact sites, sediment is transported off-site, but does not reach a high magnitude. High impact sites have significant erosion that flows directly to a ditch or water body.

For the purposes of projecting future compliance with the E&SC law, only high impact sites were evaluated.

² Crystal, Forest, Little Sebago Lakes and Panther Pond—all in Cumberland County.

Voluntary Contractor Certification Program

The Nonpoint Source Training and Resource Center's Voluntary Contractor Certification program (VCCP) was developed in 1997 as a non-regulatory, incentive-driven program to broaden the use of effective erosion control techniques by earth moving contractors. The program's primary purpose is to create an incentive for Maine contractors to become educated in erosion control BMPs and to prevent nonpoint source pollution from their construction activities. The secondary purpose of the program is to recognize contractors who make an effort to educate themselves in erosion control practices and implement these measures while providing an incentive for others to continue their education efforts.

The program requires that contractors complete two day-long courses in erosion control practices. The courses include information on the reasons why using erosion control practices is important as well as information on the siting, installation and maintenance of best management practices. In addition, new and innovative erosion control techniques and erosion control planning are also presented.

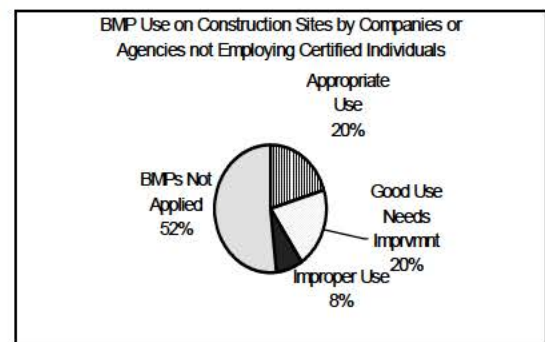
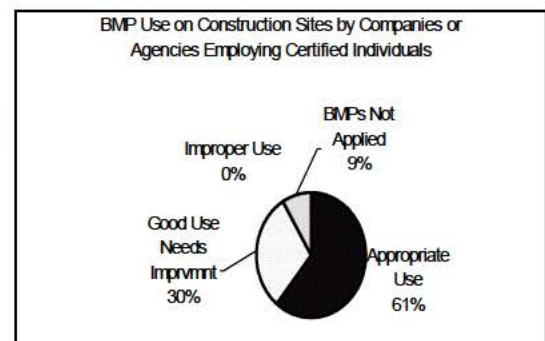
Statewide, there are approximately 800 companies who are involved in earth moving work (excavation, landscape and general contracting firms etc.) and the program has reached or trained approximately 1000 individuals, or approximately 10%, of all contractors working in Maine. After 5 years, the program is still in its infancy and with time and more visibility, more contractors should be exposed to the importance of soil erosion prevention and become certified.

The survey did ask for information on the name of the contractor for each site, if known, in order to determine how many sites did employ a certified contractor. The excavation contractor was identified for 220 sites, of which, 23 were conducted by certified contractors, or companies that employ certified contractors.

Of those 23 sites completed by companies or agencies employing certified individuals, 14 sites or 60.8 % had appropriate use of best management practices and 7 sites or 30.4% had good use but needed some improvement. Only 2 or 8.6% had not applied any best management practices.

Of the 197 sites completed by companies or agencies who did not employ certified individuals, 40 sites or 20.3% had appropriate use of best management practices and another 40 sites or 20.3% had good use but needed some improvement. The remaining 117 sites or 59.3% had either improperly used, or not applied any best management practices.

While the number of data records is limited, what data we do have clearly indicates that the use of companies employing certified individuals results in greater compliance with the E&SC Law than employing companies who do not.



Enforcement

Department Enforcement & Field Services (E&FS) staff, along with municipal code enforcement officers, have authority to enforce the requirements of the E&SC Law. When the law went into effect in 1997, no additional staff resources were provided for the program. As a result, the authority to enforce the E&SC Law has been used to a very limited degree by Department staff due to competing priorities. Data has not been collected on how often code enforcement officers have used this authority, but the number is also assumed to be very low due to other priorities. Except for sites visited in association with the survey, E&FS staff have only stopped at sites in response to complaints, or at sites that are deemed to already be impacting a water resource, or clearly have a high probability of impacting the resource due to close proximity or steep slopes.

E&FS staff responded to 920 complaints in the past year, including 128 that had an alleged violation of the E&SC Law. Of those, 4 were resolved through a consent agreement that involved a monetary penalty; 58 (45%) were resolved informally, meaning the landowner was advised of needed corrective action, which was subsequently taken; and 62 were found to not be in violation.

The Department has not proposed to change its policy in enforcing the E&SC Law. It will continue to prioritize sites for action based on a field assessment of potential impact to a water resource.

Education and Outreach

The survey findings indicate that more needs to be done by the Department to educate the public about soil erosion. This is not a new revelation, however.

The Department has, since 1995, taken several approaches to educate the public about soil erosion as part of its Nonpoint Source Pollution Program (see appendix D). In developing these approaches, the Department obtained the services of professional marketing consultants. Approaches to collect data have included phone surveys and focus groups. The first study, which began in 1995, showed that soil erosion was not considered to be an issue by the public. In 2000, the Department started an awareness campaign focused on soil erosion, using federal grant money from the Nonpoint Source (319) Program. In 2001, a number of communities were selected for a trial campaign. Several marketing approaches were used to inform the public about soil erosion, including direct mailing of post cards, newspaper advertisements and radio advertisements. After four weeks, a phone survey was conducted which showed a 12% increase in awareness of soil erosion as an issue. A further study was conducted in 2002 and repeated in 2003. The 2002 data also showed an increase in the public's awareness (see appendix D for results). Whether this awareness will lead to long-term changes in public behavior in reducing soil erosion has not yet been determined.

The Cost of Doing Erosion Control

Contractors have often indicated that when incorporating erosion control measures into a bid proposal, the increased final cost will price them right out of the bidding. The lowest bids routinely have no erosion control measures included in the proposal.

Well aware of this discrepancy, the Maine Department of Transportation began a new bidding process a few years ago that takes all of the erosion control measures out of the bidding process. Then contractors have to submit a separate proposal for the erosion control plan. Thus, every applicant is evaluated on a similar playing field. This survey showed that there is a greater rate of compliance

with DOT roadside projects than any other construction project. Therefore, it serves as a great testament to the success of this approach.

As long as it doesn't rain, erosion control measures may be considered superfluous and contractors will often gamble on the hope that it will not rain. One will often get the job done before the rain causes major damages; however, with the rain, the erosion and loss of soil can be quite costly and will take away from a contractor's benefit. The understanding that the up-front expense and time of installing the necessary erosion control measures will prevent many aggravations and expenditures during the duration of the project has not yet registered with contractors or their clients.

Conclusions

What the E&SC survey did tell us

- An overall compliance rate of 53% indicates that there are a number of unmet needs in regards to implementing the E&SC law.
- Residential (single-family lot) development is the most predominant type of development occurring in Maine.
- Residential sites are the least likely to use BMPs than any other type of construction site.
- BMP use near natural resources is good (70% of sites less than 75 feet from a natural resource had BMPs). However, freshwater wetlands are either not recognized as a valuable resource, or not recognized, with no BMPs on 72% of the sites near freshwater wetlands.



Residential site with no BMPs in place—a typical scene throughout Maine.

What survey didn't tell us

- Since sites were only visited once, the survey was a snapshot in time. In most cases, the one visit did not take place during a rain event, so the survey did not measure the actual performance of BMPs.
- The survey did not ask about soil type. Soil type factors into both erodibility and potential sedimentation of a resource.
- The survey did not give a breakdown between the use and effectiveness of individual BMPs. Surveyors were instructed to indicate all the various BMPs in use on a site, but then both BMP use and BMP effectiveness were general to the entire site (see survey data sheet—Appendix B).
- Lastly, the survey could not ascertain why landowners and contractors did not use BMPs. The survey was not designed to discern whether the lack of BMPs on some sites was due to ignorance on the part of the contractor or landowner, or was an intentional omission.

Education & Outreach

The survey findings indicate that more needs to be done to educate the public about soil erosion. The Department has spent nearly \$200,000 through the Federal Nonpoint Source Grants Program since 2000 on a campaign to build public awareness about the problem of soil erosion. However, the Department needs to continue or increase its efforts, including information about the E&SC Law requirements. To accomplish this, the Department should:

- Buy media time to get message out, as resources allow;
- Publish a brochure and make it available through town offices and equipment rental locations; and
- Enlist support of other organizations, including municipalities, through the stormwater program, Soil & Water Conservation Districts, and citizen groups such as lake associations.
-

Training & Technical Assistance

- The Department should continue to promote the voluntary Contractor Certification Program and should continue to offer annual training opportunities to contractors involved in earth-moving work. The Department should also assess the success of this program based on the rate of compliance with the E&SC Law on sites where a Certified Contractor is employed and evaluate whether the program should become mandatory at some point in the future.
- The Department should continue to provide technical assistance to municipal Code Enforcement Officers through formal training workshops and annual one-on-one field visits.

Enforcement & Compliance

- The Department should continue to track compliance activity associated with the E&SC Law. The Department should target at least five "most at risk" watersheds annually for more targeted education & outreach work, municipal code enforcement officer training, and follow-up inspections.

Maine Legislature Title 38: WATERS AND NAVIGATION
Chapter 3: PROTECTION AND IMPROVEMENT OF WATERS
Subchapter 1: ENVIRONMENTAL PROTECTION BOARD
Article 2: POLLUTION CONTROL

§420-C. Erosion and sedimentation control

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in section 480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken and the site must be maintained to prevent unreasonable erosion and sedimentation.

A person who owns property that is subject to erosion because of a human activity before July 1, 1997 involving filling, displacing or exposing soil or other earthen materials shall take measures in accordance with the dates established under this paragraph to prevent unreasonable erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8. Adequate and timely temporary and permanent stabilization measures must be taken and maintained on that site to prevent unreasonable erosion and sedimentation. This paragraph applies on and after July 1, 2005 to property that is located in the watershed of a body of water most at risk as identified in the department's storm water rules adopted pursuant to section 420-D and that is subject to erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8. This paragraph applies on and after July 1, 2010 to other property that is subject to erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8.

This section applies to a project or any portion of a project located within an organized area of this State. This section does not apply to agricultural fields. Forest management activities, including associated road construction or maintenance, conducted in accordance with applicable standards of the Maine Land Use Regulation Commission, are deemed to comply with this section. This section may not be construed to limit a municipality's authority under home rule to adopt ordinances containing stricter standards than those contained in this section.

E&SC Compliance Survey

Date: _____

Town: _____

Inspector: _____

Road/street: _____

UTM Northing _____

Reference point: _____

UTM Easting _____

1. How was site discovered?

- Through town permit
- State permit
- Chance drive by
- Complaint
- Other _____

2. What kind of project?

- Road
- Residential site
- Commercial development
- Industrial
- Other _____

3. What stage of construction?

- Early
- Middle
- Late

4. Slope of disturbed area?

- Flat
- Moderate _____
- Steep _____

5. What size of disturbance?

- < 5000 sq.ft.
- 5000 sq.ft. – 10000 sq.ft.
- 10000 sq.ft. – 1 acre
- >1 acre

6. What resource does it drain to?

- Lake
- Stream
- River
- Marine
- Freshwater Wetland
- Unknown

Follow-up contact needed?

With Property owner: _____

With Contractor: _____

Comments: _____

7. Proximity to resource?

- < 75 feet
- 75 – 250 feet
- > 250 feet

8. Kind of BMPs used?

- None
- Hay bales
- Silt fence
- Mulch
- Erosion Control Mix
- Vegetation
- Other _____

9. BMP Use?

- Appropriate Use
- Good Use but Need Improvement
- Improper use
- BMPs Not Applied
- BMPs Applied After the Fact

10. BMPs effectiveness?

- Negligible Soil Erosion
- Some Erosion But Not Off-Site
- Minor Soil Erosion Off-site
- Soil Movement Into Resource

11. Level of inspection

- Walked site
- Street survey

12. Spoke with owner/contractor?

- Yes
- No

E&SC Compliance Survey Instructions

Submit all forms to Mary Breton or Marianne Hubert. Add any information that could be helpful.

When to stop: Fill in a survey form for projects that are under construction. If a backhoe or any other heavy equipment is needed, it is a construction site. Chronic erosion problems don't qualify. Farm fields and gardens don't apply.

Project location:

Be as specific as you can for the project's location, town, road, distance to intersection, point of reference, etc. Name the project if known. Include the GIS coordinates if available.

1. How was site discovered?

Identify how the project was discovered.

2. What kind of project?

To the best of your knowledge identify the kind of project

3. What stage of construction?

- **Early:** site is grubbed and foundation is being dug or done
- **Middle:** Structures are being constructed, and the access drive/parking is fully stabilized with gravel
- **Late:** Project is constructed and final grading/paving is underway

4. What is the slope of the site

The slope surrounding the development is what is indicative for erosion potential. The slope may either be disturbed or still standing with natural vegetation. Identify approximately the slope ratio (2:1, 3:1).

- The project is mostly **flat**, erosion would be minimal.
- The project is **moderately** sloped (approximately 3:1) vegetation can healthily grow, if not stabilized, rill erosion would occur. Can be identified if when standing at the base of the slope, at eye level, the slope would be some 15-20 feet away.
- The site is **steep**, vegetation would not grow easily, erosion could be massive. Can be identified if when standing at the base of the slope, at eye level, the slope would be some 5-10 feet away.

5. What size of disturbance?

- **< 5000 sq. ft.**, the project is not very big, as in road side work (20 ft wide by 250 ft long)
- **5000 sq. ft. – 10000 sq. ft.**, size of a basketball court, this would be equivalent to a small house lot being developed with little disturbance for lawn or landscaping
- **10000 sq. ft. – 1 acre** The project would be a large house lot with a great amount of disturbance of lawn or for a small commercial site.
- **> 1 acre** – Size greater than a football field - the project should have a DEP permit

6. What resource does it drain to?

To your best ability, identify the watershed the project is on. It will be more difficult to establish but less critical if the site is far away from the resource. A GIS location is helpful for these.

7. Proximity to resource?

- **< 75 feet** – This will be easy to establish as the resource should be quite visible
- **75 – 250 feet** – Can you see the resource, can you pace it
- **> 250 feet** – If you can not see it or know of its existence

8. Is it in shoreland zoning?

If possible, identify if the project is in a shoreland zone.

9. Kind of BMPs used?

Establish all the different kind of BMPs, mark as many as is appropriate.

10. BMP Use?

Overall, how are the BMPs used? There maybe some BMP use but not sufficiently or everywhere that it is needed. Rate based on your perception of what it should be.

11. BMP Effectiveness?

Overall, establish the level of soil erosion. Identify weather condition if needed to appropriately describe the site conditions. Rate based on your perception of what it should be.

12. Did you walk the entire site or was it a street survey only?

13. Did you speak with the owner or contractor?

14. Follow-up contact needed?

Fill in only if you talked with the owner or contractor and they would like to receive more information or a follow-up is needed. Identify who will be needing to do the follow-up.

Appendix C

Types of BMPs

TYPE OF BMPs AND THEIR USE															
	HAY BALES		SILT FENCE		MULCH		EROSION CONTROL MIX		VEGETATION		OTHER BMPs		NONE		TOTAL
APPROPRIATE USE	34	65%	80	46%	86	66%	18	60%	55	67%	43	54%	5	1%	321
GOOD USE/NEED IMPROVEMENT	13	25%	61	35%	40	31%	12	40%	22	27%	29	36%	3	1%	180
IMPROPER USE	5	10%	28	16%	4	3%	0	0%	2	2%	6	8%	24	5%	69
NO BMPs	0	0%	1	1%	0	0%	0	0%	1	1%	2	3%	435	92%	439
BMPs APPLIED AFTER THE FACT	0	0%	2	1%	1	1%	0	0%	0	0%	0	0%	1	0%	4
NO ANSWER	0	0%	1	1%	0	0%	0	0%	2	2%	0	0%	6	1%	9
TOTAL	52	5%	173	17%	131	13%	30	3%	82	8%	80	8%	474	46%	1022

TYPE OF BMPs AND THEIR EFFECTIVENESS															
	HAY BALES		SILT FENCE		MULCH		EROSION CONTROL MIX		VEGETATION		OTHER BMPs		NONE		TOTAL
NEGLECTIBLE SOIL EROSION	30	57%	80	46%	88	67%	16	53%	55	67%	41	51%	171	36%	481
SOME EROSION BUT NOT OFF-SITE	11	21%	44	25%	25	19%	7	23%	14	17%	11	14%	78	16%	190
MINOR SOIL EROSION OFF-SITE	5	9%	33	19%	9	7%	5	17%	7	9%	18	23%	63	13%	140
SOIL MOVEMENT INTO RESOURCE	5	9%	8	5%	4	3%	2	7%	2	2%	4	5%	27	6%	52
NO ANSWER	2	4%	8	5%	5	4%	0	0%	4	5%	6	8%	134	28%	159
TOTAL	53	5%	173	17%	131	13%	30	3%	82	8%	80	8%	473	46%	1022

Construction Type

ROAD PROJECTS - BMP USE AND EFFECTIVENESS											
	NEGLIGIBLE SOIL EROSION		SOME SOIL EROSION, NOT OFF SITE		MINOR SOIL EROSION OFF-SITE		SOIL MOVEMENT INTO RESOURCE		NO ANSWER		TOTAL
APPROPRIATE USE	37	77%	3	23%	2	18%	1	14%	2	18%	45
GOOD USE/NEED IMPROVEMENT	3	6%	6	46%	1	9%	3	43%	1	9%	14
IMPROPER USE	3	6%	1	8%	1	9%	0	0%	0	0%	5
NO BMPS	5	10%	3	23%	7	64%	2	29%	5	45%	22
BMPS APPLIED AFTER THE FACT	0	0%	0	0%	0	0%	1	14%	1	9%	2
NO ANSWER	0	0%	0	0%	0	0%	0	0%	2	18%	2
TOTAL	48	53%	13	14%	11	12%	7	8%	11	12%	90

RESIDENTIAL PROJECTS - BMP USE AND EFFECTIVENESS											
	NEGLIGIBLE SOIL EROSION		SOME SOIL EROSION, NOT OFF SITE		MINOR SOIL EROSION OFF-SITE		SOIL MOVEMENT INTO RESOURCE		NO ANSWER		TOTAL
APPROPRIATE USE	91	36%	13	12%	2	3%	0	0%	3	3%	109
GOOD USE/NEED IMPROVEMENT	17	7%	22	20%	14	18%	1	4%	5	4%	59
IMPROPER USE	10	4%	17	15%	13	17%	1	4%	1	1%	42
NO BMPS	132	53%	58	53%	45	58%	21	91%	98	85%	354
BMPS APPLIED AFTER THE FACT	0	0%	0	0%	1	1%	0	0%	0	0%	1
NO ANSWER	1	0%	0	0%	2	3%	0	0%	8	7%	11
TOTAL	251	44%	110	19%	77	13%	23	4%	115	20%	576

INDUSTRIAL AND COMMERCIAL PROJECTS - BMP USE AND EFFECTIVENESS											
	NEGLIGIBLE SOIL EROSION		SOME SOIL EROSION, NOT OFF SITE		MINOR SOIL EROSION OFF-SITE		SOIL MOVEMENT INTO RESOURCE		NO ANSWER		TOTAL
APPROPRIATE USE	14	36%	2	12%	0	0%	0	0%	4	18%	20
GOOD USE/NEED IMPROVEMENT	10	26%	5	29%	7	39%	0	0%	0	0%	22
IMPROPER USE	4	10%	4	24%	3	17%	0	0%	0	0%	11
NO BMPS	11	28%	6	35%	8	44%	1	50%	18	82%	44
BMPS APPLIED AFTER THE FACT	0	0%	0	0%	0	0%	1	50%	0	0%	1
NO ANSWER	0	0%	0	0%	0	0%	0	0%	0	0%	0
TOTAL	39	40%	17	17%	18	18%	2	2%	22	22%	98

OTHER PROJECTS - BMP USE AND EFFECTIVENESS											
	NEGLIGIBLE SOIL EROSION		SOME SOIL EROSION, NOT OFF SITE		MINOR SOIL EROSION OFF-SITE		SOIL MOVEMENT INTO RESOURCE		NO ANSWER		TOTAL
APPROPRIATE USE	6	38%	0	0%	1	13%	0	0%	0	0%	7
GOOD USE/NEED IMPROVEMENT	3	19%	6	67%	3	38%	3	50%	0	0%	15
IMPROPER USE	2	13%	1	11%	2	25%	1	17%	0	0%	6
NO BMPS	5	31%	2	22%	2	25%	2	33%	7	100%	18
BMPS APPLIED AFTER THE FACT	0	0%	0	0%	0	0%	0	0%	0	0%	0
NO ANSWER	0	0%	0	0%	0	0%	0	0%	0	0%	0
TOTAL	16	35%	9	20%	8	17%	6	13%	7	15%	46

Size of the Construction Site

SIZE OF DISTURBANCE AND BMP USE											
	LESS THAN 5,000 SQ.FT.		5,000 SQ.FT TO 10,000 SQ.FT		10,000 SQ.FT. TO 1 ACRE		GREATER THAN 1 ACRE		NO ANSWER		TOTAL
APPROPRIATE USE	59	23%	64	20%	34	23%	20	31%	4	33%	181
GOOD USE/NEED IMPROVEMENT	27	10%	40	12%	21	14%	21	33%	1	8%	110
IMPROPER USE	18	7%	28	9%	8	6%	7	11%	3	25%	64
NO BMPS	152	58%	188	57%	81	56%	16	25%	2	17%	439
BMPS APPLIED AFTER THE FACT	1	0%	2	1%	0	0%	0	0%	0	0%	3
NO ANSWER	5	2%	5	2%	1	1%	0	0%	2	17%	13
TOTAL	262	32%	327	40%	145	26%	64	12%	12	2%	810

SIZE OF DISTURBANCE AND BMP EFFECTIVENESS											
	LESS THAN 5,000 SQ.FT.		5,000 SQ.FT TO 10,000 SQ.FT		10,000 SQ.FT. TO 1 ACRE		GREATER THAN 1 ACRE		NO ANSWER		TOTAL
Negligible Soil Erosion	130	50%	137	42%	61	42%	21	33%	6	50%	355
SOME EROSION BUT NOT OFF-SITE	48	18%	53	16%	30	21%	15	23%	1	8%	147
MINOR SOIL EROSION OFF-SITE	20	8%	49	15%	25	17%	18	28%	2	17%	114
SOIL MOVEMENT INTO RESOURCE	6	2%	11	3%	14	10%	7	11%	0	0%	38
NO ANSWER	58	22%	77	24%	15	10%	3	5%	3	25%	156
TOTAL	262	32%	327	40%	145	18%	64	8%	12	1%	810

Watershed Type

TYPE OF RESOURCE AND BMP USE													
	LAKE		STREAM		RIVER		MARINE		FRESHWATER WETLAND		UN-KNOWN		TOTAL
APPROPRIATE USE	66	33%	49	31%	16	22%	13	22%	12	10%	25	13%	181
NEEDS IMPROVEMENT	33	16%	20	13%	14	19%	6	10%	11	9%	26	13%	110
IMPROPER USE	17	8%	14	9%	7	10%	5	9%	9	7%	12	6%	64
NO BMPS	84	42%	74	47%	35	48%	34	59%	88	72%	124	63%	439
BMPS APPLIED AFTER THE FACT	1	0%	1	1%	0	0%	0	0%	1	1%	0	0%	3
NO ANSWER	1	0%	1	1%	1	1%	0	0%	1	1%	9	5%	13
TOTAL	202	25%	159	20%	73	9%	58	7%	122	15%	196	24%	810

TYPE OF RESOURCE AND BMP EFFECTIVENESS													
	LAKE		STREAM		RIVER		MARINE		FRESHWATER WETLAND		UN-KNOWN		TOTAL
Negligible Soil Erosion	108	53%	78	49%	27	37%	28	48%	36	30%	78	40%	355
Some Erosion, but not off site	44	22%	23	14%	15	21%	5	9%	21	17%	39	20%	147
Minor soil erosion off-site	27	13%	22	14%	13	18%	9	16%	17	14%	26	13%	114
Soil Movement into Resource	2	1%	9	6%	4	5%	0	0%	21	17%	2	1%	38
No Answer	21	10%	27	17%	14	19%	16	28%	27	22%	51	26%	156
TOTAL	202	25%	159	20%	73	9%	58	7%	122	15%	196	24%	810

Proximity to Resource

PROXIMITY TO RESOURCE AND BMP USE									
	LESS THAN 75 FEET		75 TO 250 FEET		GREATER THAN 250 FEET		DISTANCE UNKNOWN		TOTAL
	APPROPRIATE USE	44	31%	60	27%	72	18%	5	
GOOD USE/NEED IMPROVEMENT	27	19%	29	13%	47	12%	7	15%	110
IMPROPER USE	23	16%	21	9%	20	5%	0	0%	64
NO BMPS	42	30%	112	50%	252	63%	33	70%	439
BMPS APPLIED AFTER THE FACT	2	1%	1	0%	0	0%	0	0%	3
NO ANSWER	2	1%	0	0%	9	2%	2	4%	13
TOTAL	140	17%	223	28%	400	49%	47	6%	810

PROXIMITY TO RESOURCE AND BMP EFFECTIVENESS									
	LESS THAN 75 FEET		75 TO 250 FEET		GREATER THAN 250 FEET		DISTANCE UNKNOWN		TOTAL
	Negligible Soil Erosion	56	40%	100	45%	189	47%	10	
Some Erosion, but not off site	23	16%	41	18%	78	20%	5	11%	147
Minor Soil Erosion off site	24	17%	28	13%	60	15%	2	4%	114
Soil Movement into Resource	18	13%	19	9%	1	0%	0	0%	38
No Answer	19	14%	35	16%	72	18%	30	64%	156
TOTAL	140	17%	223	28%	400	49%	47	6%	810

Slope of Construction Site

SLOPE OF DISTURBED AREA AND BMP USE									
	FLAT		MODERATE		STEEP		NO ANSWER		TOTAL
APPROPRIATE USE	56	18%	102	26%	18	20%	5	45%	181
GOOD USE/NEED IMPROVEMENT	29	9%	63	16%	17	19%	1	9%	110
IMPROPER USE	14	4%	39	10%	11	12%	0	0%	64
NO BMPS	207	66%	185	47%	43	47%	4	36%	439
BMPS APPLIED AFTER THE FACT	0	0%	2	1%	1	1%	0	0%	3
NO ANSWER	6	2%	5	1%	1	1%	1	9%	13
TOTAL	312	39%	396	49%	91	11%	11	1%	810

SLOPE OF DISTURBED AREA AND BMP EFFECTIVENESS									
	FLAT		MODERATE		STEEP		NO ANSWER		TOTAL
Negligible Soil Erosion	165	53%	151	38%	30	33%	9	82%	355
Some Erosion, but not off site	43	14%	90	23%	13	14%	1	9%	147
Minor Soil Erosion off site	29	9%	68	17%	17	19%	0	0%	114
Soil Movement into Resource	8	3%	18	5%	12	13%	0	0%	38
No Answer	67	21%	69	17%	19	21%	1	9%	156
TOTAL	312	39%	396	49%	91	11%	11	1%	810

Overall Compliance

All surveyed sites based on slope - 725 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	No Answer	5				
Good Use but Needs Improvement	No Answer	1				
No BMPs	No Answer	3	1			
No Answer	No Answer					1
Appropriate Use	Flat	50	4			
Good Use but Needs Improvement	Flat	14	9	4	1	1
Improper Use	Flat	5	6	3	0	
No BMPs	Flat	96	24	20	7	60
No Answer	Flat			2		4
Appropriate Use	Moderate	77	14	4	1	6
Good Use but Needs Improvement	Moderate	16	27	15	3	2
Improper Use	Moderate	11	12	15	1	
No BMPs	Moderate	46	37	34	11	57
BMPs Applied after the Fact	Moderate				2	
No Answer	Moderate	1				4
Appropriate Use	Steep	17	0	1	0	
Good Use but Needs Improvement	Steep	2	3	6	3	3
Improper Use	Steep	3	5	1	1	1
No BMPs	Steep	8	5	8	8	14
No Answer	Steep					1
BMPs Applied after the Fact	Steep			1		
Total		355	147	114	38	154

Compliance 56%

Cells carrying this pattern are not included in the analysis of compliance

Construction Type

Commercial Development - 77 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Flat	6	1			2
Good Use but Needs Improvement	Flat	5	3	2		
Improper Use	Flat	1	1	2		
No BMPs	Flat	8	1	4		14
Appropriate Use	Moderate	7	1			1
Good Use but Needs Improvement	Moderate	3	2	3		
Improper Use	Moderate	2	3	1		
No BMPs	Moderate	3	1	4	1	3
BMPs Applied after the Fact	Moderate				1	
Appropriate Use	Steep	1				
Good Use but Needs Improvement	Steep	2		2		
Improper Use	Steep	1				
No BMPs	Steep					2
Total		39	13	18	2	22

Compliance 62%

No Construction Type Specified - 4 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
No BMPs	No Answer		1			
Appropriate Use	Moderate	1				
No BMPs	Moderate		1			1

Compliance 50%

Other Construction Type - 43 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Good Use but Needs Improvement	Flat	1	2			
Improper Use	Flat	1				
No BMPs	Flat	3	2	1	1	3
Appropriate Use	Moderate	3		1		
Good Use but Needs Improvement	Moderate	2	4	2	1	
Improper Use	Moderate	1	1	2		
No BMPs	Moderate	1		1		3
Appropriate Use	Steep	3				
Good Use but Needs Improvement	Steep			1	2	
Improper Use	Steep				1	
No BMPs	Steep	1			1	1
Total		16	9	8	6	7

Compliance 53%

Residential Sites - 517 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	No Answer	2				
Good Use but Needs Improvement	No Answer	1				
No BMPs	No Answer	3				
Appropriate Use	Flat	35	3			
Good Use but Needs Improvement	Flat	8	3	2	1	1
Improper Use	Flat	3	4	1		
No Answer	Flat			2		4
No BMPs	Flat	82	21	15	6	43
Appropriate Use	Moderate	46	10	1		3
Good Use but Needs Improvement	Moderate	8	16	9		1
Improper Use	Moderate	7	8	11	1	
No BMPs	Moderate	40	33	24	8	47
No Answer	Moderate	1				3
Appropriate Use	Steep	8		1		
Good Use but Needs Improvement	Steep		3	3		3
Improper Use	Steep		5	1		1
No BMPs	Steep	7	4	6	7	9
BMPs Applied after the Fact	Steep			1		
No Answer	Steep					1
Total		251	110	77	23	116

Compliance 54%

Road Sites - 84 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	No Answer	3				
No Answer	No Answer					1
Appropriate Use	Flat	9				
Good Use but Needs Improvement	Flat		1			
Improper Use	Flat		1			
No BMPs	Flat	3				
Appropriate Use	Moderate	20	3	2	1	2
Good Use but Needs Improvement	Moderate	3	5	1	2	1
Improper Use	Moderate	1		1		
No BMPs	Moderate	2	2	5	2	3
BMPs Applied after the Fact	Moderate				1	
No Answer	Moderate					1
Appropriate Use	Steep	5				
Good Use but Needs Improvement	Steep				1	
Improper Use	Steep	2				
No BMPs	Steep		1	2		2
Total		48	13	11	7	10

Compliance 67%

Size of Construction

Under 5,000 square feet - 219 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	3				
No BMPs	Unknown	1				
Appropriate Use	Flat	20	2			
Good Use but Needs Improvement	Flat	3	1	1	1	1
Improper Use	Flat		3			
No BMPs	Flat	48	10	3	1	32
No Answer	Flat					3
Appropriate Use	Moderate	23	3			2
Good Use but Needs Improvement	Moderate	4	10			1
Improper Use	Moderate	2	6	5		
No BMPs	Moderate	15	8	8		9
BMPs Applied after the Fact	Moderate				1	
No Answer	Moderate					2
Appropriate Use	Steep	6				
Good Use but Needs Improvement	Steep	1		1	1	2
Improper Use	Steep		2			
No BMPs	Steep	4	3	2	2	6
Total		130	48	20	6	58

Compliance 69%

5,000 to 10,000 sq ft - 300 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Good Use but Needs Improvement	Unknown	1				
Appropriate Use	Flat	18	1			
Good Use but Needs Improvement	Flat	4	3	1		
Improper Use	Flat	3	2	1		
No BMPs	Flat	33	10	9		19
No Answer	Flat			2		1
Appropriate Use	Moderate	30	2	1		3
Good Use but Needs Improvement	Moderate	6	8	5	1	1
Improper Use	Moderate	8	3	5		
No BMPs	Moderate	20	16	17	4	43
BMPs Applied after the Fact	Moderate				1	
No Answer	Moderate					1
Appropriate Use	Steep	9				
Good Use but Needs Improvement	Steep	1	3	3	2	1
Improper Use	Steep	1	3	1	1	
No BMPs	Steep	3	2	3	2	7
BMPs Applied after the Fact	Steep			1		
No Answer	Steep					1
Total		137	53	49	11	77

Compliance 50%

10,000 sq ft to one acre - 134 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	unknown	1				
No BMPs	unknown	2				
Appropriate Use	Flat	8	1			2
Good Use but Needs Improvement	Flat	5	3	1		
Improper Use	Flat		1			
No BMPs	Flat	13	3	5	3	9
Unknown use	Moderate	1				
Appropriate Use	Moderate	17	4			
Good Use but Needs Improvement	Moderate	2	4	6		
Improper Use	Moderate	1	2	3	1	
No BMPs	Moderate	9	12	8	7	3
Appropriate Use	Steep	1				
No BMPs	Steep	1		2	3	1
Total		61	30	25	14	15

Compliance 51%

Greater than one acre - 63 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Flat	4				
Good Use but Needs Improvement	Flat	1	2	1		
Improper Use	Flat	2		2		
No BMPs	Flat	2	1	3	3	
Appropriate Use	Moderate	5	5	2	1	1
Good Use but Needs Improvement	Moderate	4	5	4	2	
Improper Use	Moderate		1	2		
No BMPs	Moderate	2	1	1		2
Appropriate Use	Steep	1		1		
Good Use but Needs Improvement	Steep			2		
No BMPs	Steep				1	
Total		21	15	18	7	3

Compliance 52%

Unknown size - 9 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	unknown	1				
No BMPs	unknown		1			
Good Use but Needs Improvement	Flat	1				
Unknown	Moderate					1
Appropriate Use	Moderate	2		1		
Improper Use	Steep	2				1
No BMPs	Steep			1		
Total		6	1	2	0	2

Compliance 78%

Slope of Construction Site

Unknown Slope - 10 sites					
	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	5				
Good Use but Needs Improvement	1				
No BMPs	3	1			
No Answer					1
Total	9	1	0	0	1
Compliance	100%				

Flat Slope - 245 sites					
	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	50	4	0	0	2
Good Use but Needs Improvement	14	9	4	1	1
Improper Use	5	6	3	0	0
No BMPs	96	24	20	7	60
No Answer			2		4
Total	165	43	29	8	67
Compliance	85%				

Moderate Slope - 428 sites					
	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	77	14	4	1	6
Good Use but Needs Improvement	16	27	15	3	2
Improper Use	11	12	15	1	0
No BMPs	58	49	49	12	61
BMPs Applied after the Fact				2	
No Answer	1				4
Total	163	102	83	19	73
Compliance	37%				

Steep Slope - 86 sites					
	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	17	0	1	0	0
Good Use but Needs Improvement	2	3	6	3	3
Improper Use	3	5	1	1	1
No BMPs	8	5	8	8	14
BMPs Applied after the Fact			1		
No Answer					1
Total	30	13	17	12	19
Compliance	35%				

Cells carrying this pattern are not included in the analysis of compliance

Proximity to Natural Resource

Less than 75 feet - 131 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	3				
Appropriate Use	Flat	12	2			
Good Use but Needs Improvement	Flat		2	1	1	1
Improper Use	Flat	1	2	1		
No BMPs	Flat	3	2	1	3	5
No Answer	Flat			1		
Appropriate Use	Moderate	17	2	2	1	
Good Use but Needs Improvement	Moderate	3	4	5	2	1
Improper Use	Moderate	3	3	6	1	
No BMPs	Moderate	4	2	3	1	7
BMPs Applied after the Fact	Moderate				2	
No Answer	Moderate					1
Appropriate Use	Steep	5				
Good Use but Needs Improvement	Steep	1		2	3	1
Improper Use	Steep	1	3	1	1	
No BMPs	Steep	3	1	1	3	3
Total		56	23	24	18	19

Compliance 53%

75 to 250 feet to Resource - 201 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Flat	14	1			1
Good Use but Needs Improvement	Flat	1	3	1		
Improper Use	Flat	2	2	1		
No BMPs	Flat	19	7	2	4	14
Appropriate Use	Moderate	31	3	1		3
Good Use but Needs Improvement	Moderate	7	10	3	1	1
Improper Use	Moderate	5	4	4		
No BMPs	Moderate	15	9	12	10	11
Appropriate Use	Steep	5		1		
Good Use but Needs Improvement	Steep					2
Improper Use	Steep		2			1
No BMPs	Steep	1		2	4	2
BMPs Applied after the Fact	Steep			1		
Total		100	41	28	19	35

Compliance 58%

More than 250 feet - 360 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	1				
Good Use but Needs Improvement	Unknown	1				
No BMPs	Unknown	2				
Appropriate Use	Flat	23	1			
Good Use but Needs Improvement	Flat	11	4	2		
Improper Use	Flat	2	2	1		
No BMPs	Flat	73	15	17		34
No Answer	Flat			1		4
Appropriate Use	Moderate	27	9	1		3
Good Use but Needs Improvement	Moderate	6	11	6		
Improper Use	Moderate	3	5	5		
No BMPs	Moderate	27	24	19		24
No Answer	Moderate	1				2
Appropriate Use	Steep	7				
Good Use but Needs Improvement	Steep		3	3		
Improper Use	Steep	2				
No BMPs	Steep	3	4	5	1	4
No Answer	Steep					1
Total		189	78	60	1	72

Compliance 59%

Unknown proximity to resource - 37 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	1				
No BMPs	Unknown	1	1			
Appropriate Use	Flat	1				1
Good Use but Needs Improvement	Flat	2				
No BMPs	Flat	1				7
Appropriate Use	Moderate	2				
Good Use but Needs Improvement	Moderate		2	1		
No BMPs	Moderate		2			15
No Answer	Moderate					1
Good Use but Needs Improvement	Steep	1		1		
No BMPs	Steep	1				5
Total		10	5	2	0	29

Compliance 32%

Type of Natural Resource

No Answer - Resource Type - 13 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
No BMPs	Unknown		1			
Good Use but Needs Improvement	Flat	1	1			
Improper Use	Flat			1		
No Answer	Flat			1		
Appropriate Use	Moderate	1				1
Good Use but Needs Improvement	Moderate		1			
No BMPs	Moderate		1			3
No Answer	Moderate					1
Good Use but Needs Improvement	Steep	1				
Improper Use	Steep	1				
Total		4	4	2	0	5

Compliance 54%

River - 64 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Flat	3				1
Good Use but Needs Improvement	Flat	3				
Improper Use	Flat		1			
No BMPs	Flat	4	1	5		7
No Answer	Flat					1
Appropriate Use	Moderate	8	1	1		
Good Use but Needs Improvement	Moderate	3	3	1	1	
Improper Use	Moderate		3	3		
No BMPs	Moderate	2	4	3		4
Appropriate Use	Steep	2				
Good Use but Needs Improvement	Steep		2		1	
No BMPs	Steep	2			2	1
Total		27	15	13	4	14

Compliance 53%

Marine - 50 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Flat	3				
No BMPs	Flat	10	1			7
Appropriate Use	Moderate	5	1			1
Good Use but Needs Improvement	Moderate	2	1	3		
Improper Use	Moderate	2		3		
No BMPs	Moderate	3	2	2		7
Appropriate Use	Steep	3				
No BMPs	Steep			1		1
Total		28	5	9	0	16

Compliance 56%

Lake - 189 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	2				
No BMPs	Unknown	2				
Appropriate Use	Flat	19	2			
Good Use but Needs Improvement	Flat	2	1	2		1
Improper Use	Flat	1	3			
No BMPs	Flat	24	7	5		7
No Answer	Flat					1
Appropriate Use	Moderate	33	4	1		1
Good Use but Needs Improvement	Moderate	5	11	5		1
Improper Use	Moderate	2	2	3		
No BMPs	Moderate	13	8	7		5
BMPs Applied after the Fact	Moderate				1	
Appropriate Use	Steep	4				
Good Use but Needs Improvement	Steep		1	1	1	2
Improper Use	Steep	1	4	1		
No BMPs	Steep		1	2		3
Total		108	44	27	2	21

Compliance 69%

Freshwater Wetland - 108 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	1				
Appropriate Use	Flat	4				
Good Use but Needs Improvement	Flat		2	1		
Improper Use	Flat	3				
No BMPs	Flat	8	4	1	5	13
No Answer	Flat			1		
Appropriate Use	Moderate	3	2	1		
Good Use but Needs Improvement	Moderate		3	2	1	
Improper Use	Moderate		2	2	1	
No BMPs	Moderate	12	7	9	9	12
BMPs Applied after the Fact	Moderate				1	
Appropriate Use	Steep	1				
Good Use but Needs Improvement	Steep	1				1
Improper Use	Steep				1	
No BMPs	Steep	3	1		3	1
Total		36	21	17	21	27

Compliance 31%

Stream - 144 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Unknown	2				
Good Use but Needs Improvement	Unknown	1				
No BMPs	Unknown	1				
Appropriate Use	Flat	15	1			
Good Use but Needs Improvement	Flat	3	3		1	
Improper Use	Flat	1	2	2		
No BMPs	Flat	14	1	2	1	10
Appropriate Use	Moderate	16	4	1	1	2
Good Use but Needs Improvement	Moderate	3	3	2	1	1
Improper Use	Moderate	1	3	4		
No BMPs	Moderate	12	5	6	2	10
No Answer	Moderate					1
Appropriate Use	Steep	7				
Good Use but Needs Improvement	Steep			1	1	
Improper Use	Steep					1
No BMPs	Steep	2	1	3	2	2
BMPs Applied after the Fact	Steep			1		
Total		78	23	22	9	27

Compliance 56%

Unknown Resource - 157 sites						
	Slope	Negligible Soil Erosion	Some Erosion but not Off-Site	Minor Soil Erosion Off-Site	Soil Movement into Resource	No Answer
Appropriate Use	Flat	6	1			1
Good Use but Needs Improvement	Flat	5	2	1		
No BMPs	Flat	36	10	7	1	16
No Answer	Flat					2
Appropriate Use	Moderate	11	2			1
Good Use but Needs Improvement	Moderate	3	5	2		
Improper Use	Moderate	6	2			
No BMPs	Moderate	4	10	7		16
No Answer	Moderate	1				2
Appropriate Use	Steep			1		
Good Use but Needs Improvement	Steep			4		
Improper Use	Steep	1	1			
No BMPs	Steep	1	2	2	1	6
No Answer	Steep					1
Total		74	35	24	2	45

Compliance 59%

NPS AWARENESS CAMPAIGN AND MARKET RESEARCH DATA

"EIGHT SIMPLE STEPS" CAMPAIGN

In 1995, the Maine DEP and State Planning Office embarked on a new approach to education and outreach to begin the NPS Pollution Program with the initial goal to raise awareness about nonpoint source pollution and produced the "Eight Simple Steps" campaign. To assist in promoting a change in behaviors, an advertising firm was hired to develop a series of radio and print messages. The information included a poster, brochure, logo, press releases and TV PSA's. In the fall of 1996, a small kick off event occurred with the airing of a half-hour television show "Maine's Polluted Water: We All Can Help".

The campaign also allowed the purchase and submission of questions on a major statewide phone survey. The results of this survey indicated that 34% of Maine's population were unable to name one thing in their neighborhood that might be polluting the water. Those who did name a source of pollution failed to name the sources of most concern. Since this original survey, 3 more rounds of questions on the fall Omnibus Survey were conducted; but it became clear that more work was needed to raise the public's awareness.

In addition to the phone surveys, the contractor conducted 2 focus groups to explore more deeply people's understanding of water-related issues. These results have allowed the DEP and SPO to refine their target audience towards Maine citizens between the ages of 35 and 55 that own homes.

SOIL CAMPAIGN

The previous research indicated that soil erosion is not even on the general public's radar screen as a water pollutant. In the summer 2000, the DEP started an awareness campaign focused on soil erosion using standard social marketing techniques and in November 2000, a marketing and advertising firm was hired to develop and implement the campaign.

With existing data on the present views of the target audience, the DEP and the advertising company developed test logos and slogans, which the market research company used when conducting *focus groups*. The focus groups provided invaluable insight into the target audience's perspectives, values, and motivation. Based on the results, the final outreach was developed including radio, newspaper and direct mail post cards.

During the summer of 2001, a number of communities selected to be a good representation of the state's demographics, were targeted for a trial campaign. Some received the post cards and the others did not to formulate a comparison of the effectiveness of direct mailing compared to other marketing venues.

At the end of four weeks, a statistically valid phone survey indicated that the campaign was effective at raising awareness by 12%. Unfortunately, behavior change was not measurable due to the short time period. The survey results also indicated that the mailed postcards were not as effective as the radio and newspaper ads. In August 2002, with a limited budget, the DEP did a targeted soil erosion campaign in communities with active 319 projects, TMDLs, or active environmental associations. At the end of the campaign, the DEP again evaluated their effectiveness with a phone survey conducted by a professional market research firm. Of the 21% who remembered seeing or hearing the ads, 42% correctly identified a behavior (BMP) that was encouraged in the campaign. Of the 23% who said they had done something to prevent soil erosion, 73% named a behavior that was encouraged by the campaign. The results were greatly improved over the previous three years of surveys, proving the effectiveness of the campaign materials in raising awareness and likely in changing behavior. The survey was repeated during the summer of 2003, however, the results are not yet available.

For more information about the NPS Soil Campaign or other outreach efforts, please contact Kathy Hoppe, Maine DEP, telephone: (207) 764-0477.