POLLUTION PREVENTION FACT SHEET:
ANIMAL WASTE COLLECTION

Description

Animal waste collection as a pollution source control involves using a combination of educational outreach and enforcement to encourage residents to clean up after their pets. The presence of pet waste in stormwater runoff has a number of implications for urban stream water quality with perhaps the greatest impact from fecal bacteria (for more information see *Microbes in Urban Watersheds: Concentrations, Sources and Pathways*, Article 17 in The Practice of Watershed Protection). According to recent research, non-human waste represents a significant source of bacterial contamination in urban watersheds. Genetic studies by Alderiso *et al*. (1996) and Trial *et al*. (1993) both concluded that 95 percent of the fecal coliform found in urban stormwater was of non-human origin. Bacterial source tracking studies in a watershed in the Seattle, Washington area also found that nearly 20% of the bacteria isolates that could be matched with host animals were matched with dogs. This bacteria can pose health risks to humans and other animals, and result in the spread of disease. It has been estimated that for watersheds of up to twenty-square miles draining to small coastal bays, two to three days of droppings from a population of about 100 dogs would contribute enough bacteria and nutrients to temporarily close a bay to swimming and shellfishing (US EPA, 1993).

Pet waste can also be a factor in eutrophication of lakes. The release of nutrients from the decay of pet waste promotes weed and algae growth, limiting light penetration and the growth of aquatic vegetation. This in turn can reduce oxygen levels in the water, affecting fish and other aquatic organisms.

Animal waste collection programs use awareness and education, signs, and pet waste control ordinances to alert residents to the proper disposal techniques for pet droppings. In some parts of the country, the concept of parks or portions of parks established specifically for urban dog owners has gained in popularity. With provisions for proper disposal of dog feces and siting and design to address stormwater runoff, these parks may represent another option for protecting local water quality.

Applicability

Pet ownership is not limited by factors such as region of the country, climate, or topography. For this reason, educational outreach regarding animal waste is appropriate throughout the country. In a survey of Chesapeake Bay residents, it was found that about 40% of households own a dog. Just about half of these dog owners actually walked their dog in public areas. Of the half that did walk their dog, about 60% claimed to pick up

after their dog (Swann, 1999), which is generally consistent with other studies (Table 1). Men were found to be less prone to pick up after their dog than women (Swann, 1999).

Residents seem to be of two minds when it comes to dog waste. While a strong majority agree that dog waste can be a water quality problem (Hardwick, 1997; Swann, 1999), they generally rank it as the least important local water quality problem (Syferd, 1995 and MCSR, 1997). This finding strongly suggests the need to dramatically improve watershed education efforts to increase public recognition about the water quality and health consequences of dog waste.

Table 1. Summary of Dog Waste Collection Surveys

Maryland (HGIC, 1996)	62% always cleaned up after the dog, 23% sometimes, 15% never Disposal method: trash can (66%), toilet (12%), other 22%
Washington (Hardwick, 1997)	Pet ownership 58% 51% of dog owners do not walk dogs 69% claimed that they cleaned up after the dog 31% do not pick up Disposal methods: trash can 54%, toilet 20%, compost pile 4% 4% train pet to poop in own yard 85% agreed that pet wastes contribute to water quality problems
Chesapeake Bay (Swann, 1999)	Dog ownership 41% 44% of dog owners do not walk dogs Dog walkers who clean up most/all of the time 59% Dog walkers who never or rarely cleanup 41% Of those who never or rarely clean up, 44% would not cleanup even with fine, complaints, or improved sanitary collection or disposal methods 63% agreed that pet wastes contribute to water quality problems

Design Considerations

Programs to control pet waste typically use "pooper-scooper" ordinances to regulate pet waste cleanup. These ordinances require the removal and proper disposal of pet waste from public areas and other peoples property before the dog owner leaves the immediate area. Often a fine is associated with failure to perform this act as a way to encourage compliance. Some ordinances also include a requirement that pet owners remove pet waste from their own property within a prescribed time frame.

Public education programs are another way to encourage pet waste removal. Often pet waste messages are incorporated into a larger non-point source message relaying the effects of pollution on local water quality. Brochures and public service announcements describe proper pet waste disposal techniques and try to create a storm drain-water quality link between pet waste and runoff.

Signs in public parks and the provision of receptacles for pet waste also encourage cleanup.

Another option for pet waste management is the use of specially designated dog parks where pets are allowed off-leash. These parks typically include signs reminding pet owners to remove waste, as well as other disposal options for pet owners. The following management options have been used in Australian dog parks and could be incorporated for dog parks here (source: Harlock Jackson *et al*., 1995):

- **Doggy loos**: These disposal units are installed in the ground and decomposition occurs within the unit. Minimal maintenance is required (no refuse collection).
- **Pooch patch**: A pole is placed in the park surrounded by a light scattering of sand. Owners are encouraged to introduce their dog to the pole on entry to the park. Dogs then return to the patch to defecate and special bins are provided in which owners then place the deposit.
- **The 'Long Grass Principle'**: Dogs are attracted to long grass for defecating and areas that are mowed less frequently can be provided for feces to disintegrate naturally. A height of around 10 cm is appropriate.

The design of these dog parks should be done to mitigate stormwater impacts. The use of vegetated buffers, pooper-scooper stations, and the siting of parks out of drainage-ways, streams and steep slopes will help control the impacts of dog waste on receiving waters.

Limitations

The reluctance of many residents to handle dog waste is the biggest limitation to controlling pet waste. According to a Chesapeake Bay survey, 44% of dog walkers who do not pick up indicated they would still refuse to pick up, even if confronted by complaints from neighbors, threatened with fines, or provided with more sanitary and convenient options for retrieving and disposing of dog waste. Table 2 provides factors that compel residents to pick up after their dog, along with some interesting rationalizations for not doing so.

Table 2. Dog Owners' Rationale for Picking Up or Not Picking Up After Their Dog (HGIC, 1996)

Reasons for not picking it up:	**Reasons for picking up:**
Because it eventually goes away	It's the law
Just because	Environmental reasons
Too much work	Hygiene/health reasons
On edge of my property	Neighborhood courtesy
It's in my yard	It should be done
It's in the woods	Keep the yard clean
Not prepared	
No reason	
Small dog, small waste	
Use as fertilizer	
Sanitary reasons	
Own a cat or other kind of pet	

This strong resistance to handling dog wastes suggests that an alternative message may be necessary. One example might be to encourage the practice of rudimentary manure management by training dogs to use areas that are not hydraulically connected to the stream or close to a buffer. For more information, see *Understanding Watershed Behavior*, Article 126 in The Practice of Watershed Protection.

Effectiveness

The pollutant removal abilities of pet waste collection programs has never been quantified although there is ample evidence that programs such as these are necessary in urban areas. For example, in the Four Mile Run watershed in Northern Virginia, a dog population of 11,400 is estimated to contribute about 5,000 pounds of solid waste every day and has been identified as a major contributor of bacteria to the stream. Approximately 500 fecal coliform samples have been taken from Four Mile Run and its tributaries since 1990, and about 50% of these samples have been over Virginia water quality standards for fecal coliform bacteria. (NVPDC, 1998). A project is currently underway to pinpoint the source of bacterial contamination through DNA fingerprinting.

There is plenty of evidence that pets and urban wildlife can be significant bacterial sources. According to van der Wel (1995) a single gram of dog feces can contain 23 million fecal coliform bacteria. Dogs can also be significant hosts of both Giardia and Salmonella (Pitt, 1998). It was also noted in a 1982 study of Baltimore, Maryland catchments that dog feces were the single greatest contributor of fecal coliform and fecal strep bacteria (Lim and Olivieri, 1982). This evidence points to a need for enforcement and education to raise resident awareness regarding the water quality impacts of this urban pollutant source

Cost

The cost of animal waste collection programs will vary depending on the intensity of the effort and the paths chosen to control pet waste. The most popular way is through an ordinance, but managers must consider the cost of enforcement, including staff and equipment requirements. Public education program costs are determined by the type of materials produced and the method of distribution selected. Signs in parks may initially have a higher cost than printed materials, but can last for many years. Signs may also be more effective, since they act as on-site reminders to dog owners to clean up in parks.

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