

# Improving Compliance with Leash Laws in Rock Creek Park

## Abstract

The purpose of this study was to determine the impact of off-leash dogs in Rock Creek Park (ROCR), and determine the best course of action to mitigate the problem. ROCR encourages responsible behavior among dog owners, using leash laws, signage, and informational materials. Unfortunately, many dog owners do not follow the rules, contributing to the detriment of the National Parks and resulting in harm to the dog. We provided recommendations to increase compliance with leash laws through a review of literature, direct observations of dog and owner behavior in ROCR, interviews with National Park Service (NPS) staff, and focus groups with relevant stakeholders. We found off-leashing to be consistent in particular areas and that dogs pose significant danger to horses and riders. We recommend a BARK Ranger program, creating pamphlets and handouts that explaining the motives behind the laws, unifying the priorities of NPS staff and Park Police, and utilizing social media to reach the public.

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## B term

**December 13, 2018**



Dogs are the most popular pet in the USA, with almost half of American households owning at least one dog (American Pet Product Association, 2017). Dog ownership provides many benefits to owners, including increased physical activity, social interactions, comfort, and a sense of security. The high density of dogs in public spaces, such as parks, creates a variety of adverse impacts. The majority of complaints and issues arise when owners allow their dog to interact off leash in public spaces. Off-leash dogs in parks pose a variety of problems, such as annoying visitors, transmitting bacteria, polluting streams and ponds, and disturbing fauna and flora. The National Park Service (NPS) has taken measures to minimize the impacts dogs on their parks by establishing rules and regulations. The NPS and many cities have leash laws that require dogs to be leashed and under control at all times in public. Often owners are aware of the regulations but choose not to comply for a variety of reasons. Owners bridle at the idea of restricting their dogs, believe their dogs are not a problem, and expect that the chances of being penalized are slim. Lack of leash law compliance has resulted in a decline in the overall visitor experience and an increase in dog-related complaints in many National Parks.

Rock Creek Park (ROCR) is an urban park under control of the National Park Service, with nearly 2.5 million visitors per year, many of whom have dogs. Currently, ROCR encourages responsible behavior among dog owners to minimize the impacts on the park, using leash laws, signage at trailheads, and informational materials (website, signs, brochures). Unfortunately, many dog owners do not follow the rules.

Given the current challenges and lack of resources in the NPS, the goal of this project is to develop a strategy for National Park Service staff to improve leash law compliance and to reduce the impacts of off-leash dogs within Rock Creek Park (ROCR). In order accomplish this goal we identified five objectives:

1. Assess the impacts of dogs in parks.
2. Evaluate current policies and practices to minimize the impact of unleashed dogs in parks.
3. Evaluate behavior of dogs, dog owners, and other park users in key areas.
4. Assess the perceptions and attitudes of different stakeholders regarding off-leashed dogs and dog owners in Rock Creek Park.

We provided recommendations to increase compliance and improve the management of dogs through a review of the literature, direct observations in key locations within ROCR, interviews with NPS staff and animal behavior experts, and through focus groups with relevant stakeholders.

### The problems with dogs in parks and urban spaces

To provide recommendations to the Rock Creek Park NPS staff in dealing with management of unleashed dogs, our team reviewed the following: popularity and benefits of dog ownership in US, the adverse impacts dogs can have on urban areas, common methods for controlling dogs in parks, and research on the attitudes and behavior of dog owners, which we discuss below.

### Popularity of dogs in the U.S.

Dogs are popular pets in the United States. According to a survey conducted by the American Pet Product Association (APPA) (“Number of dogs in the United States from 2000 to 2017 (in millions)”, 2017 ), 60.2 million U.S. households currently own 89.7 million dogs, making dogs the most common pet in the country. Data from previous surveys show that the number of dogs in the U.S. has been gradually increasing over the past 20 years, with an increase of 16% over the past decade (Figure 1). Up until 2017, almost half (48%) of American households owned at least one dog (“Historical Households Tables”, 2017 ). APPA also reports that in the U.S., dog owners spend an average of \$1549 annually on their dogs.

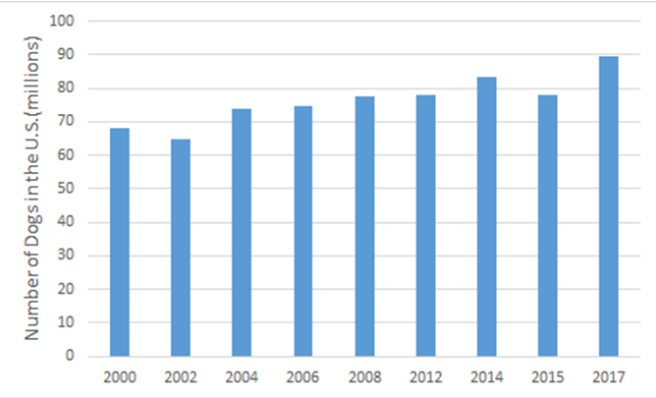


Figure 1. Dog population in U.S. from 2000 to 2017 (APPA, n.d.)

Dog walking is one of the most popular recreational activities in the world, with millions of people attracted outdoors each year (Banks & Bryant, 2007). One survey in the US found that 83.9% dog owners walk with their dogs weekly

(McCormack, Rock, Sandalack & Uribe, 2011). Research shows that 75% of dog owners regularly walk their dogs, and more than half walk their dogs once or twice per day (Cutt & Giles-Corti, 2006). A study in Australia found that dog owners typically walk their dogs 7 times per week for about 30 minutes at a time (Schofield, Mummery & Steele, 2005).

Dog ownership in general has a variety of benefits, but dog walking in particular has multiple positive effects on mental and physical health of dogs and their owners. As they increase their physical activity, dog owners also increase their social interactions and reduce their stress levels (Brown, Thompson & Mohamed, 2005; Cutt & Giles-Corti, 2006; Motooka, Koike, Yokoyama & Kennedy, 2006). Dog walking increases the owner's socializing with other like-minded dog owners, and the group membership of being a dog owner provides a sense of pride and satisfaction (Knight & Edwards, 2008). Dogs act as catalysts for promoting social interaction between dog owners and others who may even be strangers (McNicholas & Collis, 2000).

Many people in urban areas choose to walk their dogs in public parks, where dogs and owners can enjoy open spaces and fresh air; or dog parks, where dogs can roam free and socialize with other dogs ("8 best dog walking spots in Washington, D.C. in 2017", 2017). However, dogs can create adverse impacts in public settings, especially urban parks.

### **Problems caused by dogs in urban areas**

The growing number of dogs in the United States, can create a variety of adverse impacts

for both humans and the environment, especially in urban areas. Dogs may reduce the overall appeal of a park to visitors, especially visitors without dogs, due to concerns about diseases and aggressive or nuisance behaviors (Ioja, Rozyłowicz, Pătroescu, Niță & Vănau, 2011). Unleashed dogs in particular may adversely affect visitors, wildlife, the environment, and horses in parks.

### **Harm to humans**

Approximately 4.7 million people are bitten by dogs every year in the United States ("Dog-Bite-Related Fatalities -- United States, 1995-1996.", 1997). Young children and the elderly are more vulnerable and less able to protect themselves from vicious dogs and in more than one third of attacks, the victim is the owner or a family member (Santoro, Smaldone, Lozito, Smaldone, & Introna, 2011). While fatalities are rare and occur in about 2 out of 1000 dog attacks, such attacks often involve a pack of dogs and unaccompanied individuals. A dog has more opportunity to attack and do harm when it is off-leash or unrestrained. Through physical damage, dogs can spread bacteria to humans such as rabies, Capnocytophaga bacteria, Pasteurella, MRSA (methicillin-resistant Staphylococcus aureus) and Tetanus. Although these diseases are very rare now with vaccines for both humans and dogs, 18% of bites result in infections from a diversity of bacteria in dog saliva ("Preventing Dog Bites", 2018).

Besides injuring people directly, dogs can annoy park visitors with nuisance behaviors including, "hyperactivity, barking, fighting, chasing, running off, digging and aggression toward humans" (VetStreet, 2013). Dogs' nuisance behaviors can be more amplified when owners are



*Figure 2. Dog jumping on a woman (Barking Royalty, 2018)*

inattentive or off-leash their dogs. Dogs can roll in the trash or mud spreading bacteria to people they encounter in the parks. A dog that jumps on people (Figure 2) to greet them can frighten, spread bacteria or injure the person, especially if person is not prepared and this decrease the visiting experience for visitors.

Animal phobias are among the more common subtypes of phobias. Dog phobia (cynophobia) and cat phobia make up 36% of all people who seek treatment for animal phobias. People with cynophobia may suffer anxiety and stress from dogs even if they are leashed, but unleashed and uncontrolled dogs may exacerbate these fears (Rentz & Powers & Smits & Coughle & Telch, 2003).

## Harm to wildlife

When dogs run through shrubbery in a park or in the underbrush on the side of a trail, they may stress native wildlife (Gompper, 2013). Aside from killing or physically injuring wildlife, dogs may drive native animals out of their preferred habitats, disturb the prey they depend on, and expose the animals to additional dangers by forcing them to relocate (Doherty, Wirsing, Dickman, Nimmo, Ritchie, & Newsome, 2017)

## Harm to the environment

Dogs can contribute to environmental contamination of fauna and water quality in public spaces. Invasive plant species are often propagated through animal forage, specifically on an animal's fur or paw. Invasive plants compete with domestic plant species and can eventually replace them, eliminating local food source for wildlife ("Invasive Plants", n.d.). Off-leash dogs can get into underbrush otherwise restricted by the use of a leash as they can run through thick vegetation, transferring pollen and seeds that get stuck on their fur and paws from one area to a different area. When dogs introduced plant species from drastically different areas, the spread of these seeds and pollens can be very dangerous for native plant survival.

Dog waste is a nuisance to visitors and can also adversely impact the environment through the introduction of bacteria and excessive nutrient loads. Dog feces contain many pathogens including bacteria such as *campylobacteriosis*, *salmonellosis*, *toxocariasis*, and antibiotic-resistant strains of *E. coli*. In highly trafficked areas by dogs the likelihood of polluted areas increases. They can be washed into lakes and

streams from nearby park areas and from nearby streets through local storm drains without going through treatment facilities, resulting in water contamination (Sundberg, 2015). Dog wastes also contain a lot of nutrients, which can result in the excessive growth of weeds and algae in water bodies (Figure 3). Blooms of algae in water (called eutrophication) can make a lake and stream uninhabitable for fish and other aquatic species by taking up all the dissolved oxygen that other organisms need for survival (Watson, 2002). The U.S. Environmental Protection Agency estimates that, "Just two to three days of waste from 100 dogs can contribute enough bacteria, nitrogen and phosphorous to close 20 miles of a bay-watershed to swimming and shell fishing" (Adams & Lindsey, 2010).

## Harm to horses and riders

Many National Parks offer horseback riding programs for visitors, but dogs, especially when they are off-leash or otherwise uncon-



Figure 3. An algae bloom (Dan Kraker, 2017)

trolled, pose a serious threat of harm to horses and riders. Horses have excellent visual, auditory, and tactile senses but may startle and bolt when surprised by a dog on a trail. Riders, especially novice riders, may fall when a horse bolts (Johnson, 2007), resulting in traumatic injuries such as fractures, dislocations, and concussion, (Thomas & Annet & Gilchrist & Bixby-Hammett, 2006). Horses may suffer injuries directly from dog bites or when they try to flee, and the attacking dogs may suffer harm also.

## Rules and regulations for dogs

To prevent and mitigate problems associated with dogs in parks and public places, many cities and park authorities have developed laws, policies, and programs to control dogs. The most common regulations at the state level are pet licensing (which often includes proof of rabies vaccination) and specific leash laws. Rules regarding dog ownership and proper behavior are relatively consistent throughout the U.S., although specific guidelines vary by state. In the following sections, we begin by discussing the advantages and disadvantages of leashing dogs, before addressing the current status of leash laws in different places. We then examine dog regulations in national parks and some current practices for managing dogs in urban parks, including designated dog parks.

## Leashing of dogs

Dog leashing is an effective method for constraining dog behaviors since it limits the dog's radius around its owner. To reduce adverse impacts, many states have leash laws to force owners to leash their dogs in public spaces. In

general, the ruling is you must have your dog on a leash (leash lengths vary) when in public areas. In cases where this rule is not imposed, dogs must be well trained and under the owner's verbal control. Local laws may be stricter, depending on the specific environment. For example, pets are allowed on the New York City Subway only if they are caged ("Rules of Conduct and Fines", 2018). In the case of service dogs, those that need to be off-leashed to perform a certain task such as open doors or get help when their owner is in distress are allowed ("Frequently Asked Questions about Service Animals and the ADA" 2015).

Even if leashing is not required, there are many good reasons for keeping dogs on leashes, including protecting the dog from other dogs, vehicular traffic, and wildlife, including ticks. Off-leash dogs have increased risk for getting attacked by rabid wildlife; an attack that can go unnoticed and result in health issues to the dog and others it comes in contact with. Leashes also keep dogs away from other people, local wildlife, and important ecological areas ("Rules for Pets in Parks", 2018). Yet, downsides also exist for leashing dogs including: making a dog feel restricted, increasing stress levels, and increasing aggression in leashed dogs (Jarobski, Meehan & Throop, 2012).

Lack of leash law compliance has always been a problem around the world. For example, in beach areas in Australia, few dog owners leash their dogs despite the regulations against letting dogs off leash (12% and 18%). Similar situation could be found Nebraska, where leash law compliance rate was documented at only 16% on public beaches (Jorgensen, J.G. & Bomberger Brown, 2014).

## **Pets in national parks**

The majority of national parks require that pets be leashed at all times or otherwise restrained (such as in a cage), according to the Electronic Code of Federal Regulations (2018). This is not only for the safety of the pet, but for the protection of other visitors and wildlife. Not all parks allow pets, and in most parks pets are allowed only in certain areas. For example, in Joshua Tree National Park, pets are not allowed on trails or in the backcountry, and in Muir Woods National Park, pets are not allowed at all due to the small size of the park.

The Golden Gate National Recreation Area, in San Francisco, is the only park within the National Park Service system that has designated zones for unleashed dogs. Dogs there must be well trained and responsive to commands ("A Dog-Friendly National Park", 2018). Rock Creek Park requires all dogs to be leashed at all times within the park. The policy and enforcement are discussed in more detail below.

## ***Public opinions and attitudes about dogs***

According to Adams, Degeling, Massolo & Rock (2015), public opinions relating to the presence and restraint of dogs in public spaces vary substantially. The encroachment on civil liberties can produce resistance and lack of compliance with certain regulations by citizens. Some members of the public believe dogs should be banned entirely from public spaces as they have the right to enjoy the public space unhindered by dogs, such as parks, while others believe it is their right to walk their dog where they please (Adams,

Degeling, Massolo & Rock 2015).

In developing rules regarding dogs in public spaces, policy makers must balance the desires of dog owners with the concerns of others. Without a presence of pets in cities, societal benefits from pet interactions with the public are limited. However, policies are necessary to eliminate the nuisance and health problems associated with pets in public areas (Adams, Degeling, Massolo & Rock 2015).

According to O'Farrell (1997) dog owners often view their pet as an extension of themselves, but dog owners are as diverse as the dogs they own. Owners have a tendency to subconsciously project themselves or another loved one onto their dog, making the dog more sacred to them than an outsider (including others that do or do not own dogs) would view the animal. O'Farrell found in his research that out of 710 owners, 99% viewed their dog as a family member and noted that this projection leads to owners seeing only good behaviors in their dog and failing to discipline their dog. In multiple studies, researchers discovered that of the owners surveyed, many knew about leash regulations in public areas and were cognizant that dogs can cause damage to public spaces yet were unaware of the dangers associated with damages. Half of those surveyed unleashed their dog because they believed it was, "my choice how I walk my dog" (Jorgensen & Brown 2017). Even when owners can recognize unruly behavior in their dog, they often feel no desire to stop the behavior because they do not want to hinder the dog's freedom and are unaware of or trivialize the risks associated with off-leashing (O'Farrell 1997). Based on one study, Jorgensen and Brown (2017) found that dog owners ascribe bad behavior to other dogs rather than their

own dog and found that when unleashing their dog owners were more concerned with their dog's enjoyment than the opinions of other visitors, adverse consequences, or compliance with laws.

### Ways to change behaviors

While laws and regulations can be used to guide behavior in a desired direction, some people view regulations as limitations on their freedom, especially when regulations are used on public lands. This results in a resistance to compliance (Adams, Degeling, Massolo, Rock 2015). Like the enforcement of traffic speed limits, the enforcement of dog regulations can be, or appear to be, inconsistent. For example, some owners may be told to comply yet see others breaking the rules without consequences. This encourages resentment and discourages visitors from examining why they choose to unleash their dog (Jorgensen & Brown 2017). While enforcement is the most common strategy for changing leashing behavior, inconsistencies in enforcement and restrictions on budget and staff to systematically enforce results in an ineffective strategy. Strategies such as improved signage and education may be necessary to encourage behavior change and assist with compliance.

Jorgensen and Brown (2017) examined the use of different persuasive messaging to educate the public about the dangers off-leash dogs posed to the surrounding wildlife and persuade people to alter their behavior. Persuasion is intended to alter beliefs, attitudes and norms through informative messaging. Jorgensen and Brown investigated the use of a universal persuasive message as well as tailored messages for specific demographic groups. They found that messages highlighting the social dangers associated

with off-leashing were more persuasive in gaining compliance than messages about the ecological dangers. For example, signage that made owners aware of the costs of being sued as a result of their off-leash dog biting someone improved compliance more than signage explaining the damages to the piping plover community (Jorgensen & Brown, 2017).

### Lack of leash law compliance at Rock Creek Park

While D.C. has lower rates of dog ownership than many other states (e.g., 21% of households compared with the national average of 47%), ROCR is an extraordinarily popular site with 2.5 million visitors yearly, many who are dog owners (Greenwood, 2013). Situated in the Northwest region of D.C, Rock Creek Park (ROCR) extends from downtown D.C to the Maryland suburbs; it is surrounded by dense residential neighborhoods that have easy access to the park via the numerous entry points around the perimeter (Figure 4). ROCR is a large urban park with an extensive network of trails (47 different trails, spanning 32 miles) with diverse terrain suitable for dogs and dog walkers (Trail Information, 2018). The terrain of the park ranges from steep wooded areas to large open grassy areas appealing to many types of visitors (Figure 5). ROCR provides numerous parking areas for easy access for people who do not live immediately adjacent to the park as well.

Currently, ROCR policy is that all dogs must be leashed at all times within the park. Leashing regulations are in place to protect dogs from getting lost, damaging fauna, and disturbing other visitors in the park. Leashing regulations

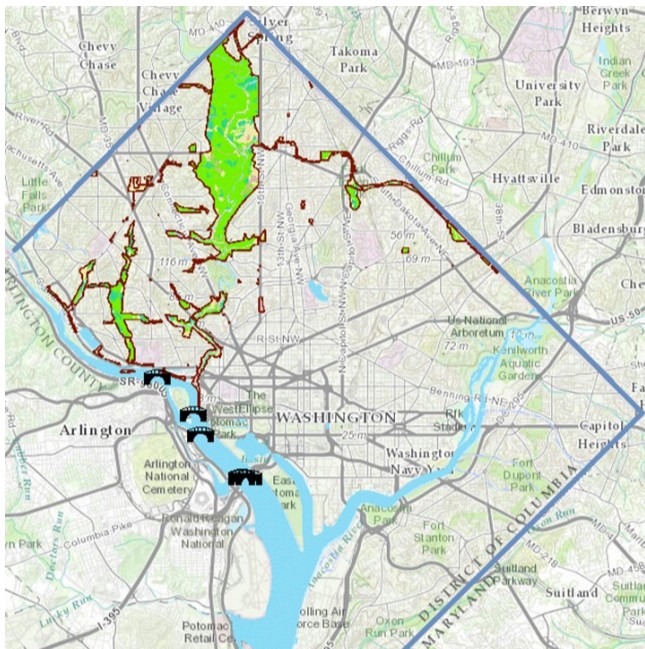


Figure 4. Map of ROCR in Relation to District of Columbia (NatureServe, 2015)

are conveyed throughout the park by signs at trailheads and entryways to parks. ROCR also informs the public on leashing regulations through educational pamphlets at visitor centers that include the rules and on the NPS website. The National Park Service website includes rules

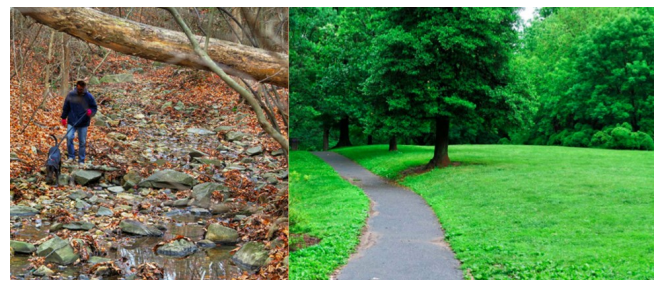


Figure 5. Rocky terrain and Montrose Park open field

regarding pets in ROCR that include keeping dogs on leash at all times. Rules also forbid leaving a pet tied and unattended as well and require pick up and disposal of pet waste. The National Park Service website provides a “Top Ten Reasons for Keeping Your Dog on a Leash” to encourage owners to leash dogs and understand the dangers of off-leashing their dog in ROCR (Figure 6). The District of Columbia also has rules against off-leashing dogs within the district, punishable by fine (“Rules for Pets in Parks”, 2018).

Many visitors enjoy walking their dog through ROCR however, many ignore leashing regulations. Rangers note that when a dog runs through the park “everything stops”; visitors, animals, and rangers cease activity, wondering how the off-leash dog will behave.

Despite the fact that ROCR is overseen and cared for by the National Park Service, the Park Rangers do not have the authority to penalize park goers for disobeying the rules, only to approach and inform visitors of misconduct. Instead, enforcement of leashing regulations is handled by the United States Park Police. Park Police is a unit of the National Park Service with jurisdiction in all Federal Parks. They patrol the parks and enforce the laws by issuing warnings, citations, and arrests. The fine is low, at only \$25, but because the leash law is considered a criminal law, the citation will show on the party’s criminal record, a large penalty for not leashing.

Rangers also express concern for the stress placed on the wildlife. ROCR is inhabited by 340 white tailed deer and has the densest raccoon population recorded nationally. Rangers believe there are 6 to 8 red and gray fox dens in the

1. Leashes protect dogs from becoming lost in the park.
2. Leashes protect dogs from coming into contact with animals who are rabid or simply aggressive. Unleashed dogs pose a danger to horses and their riders as well as risk being stepped on.
3. Leashes protect dogs from getting ticks and being exposed to Lyme Disease.
4. Unleashed dogs can be intimidating to other park visitors. Leashing your dog allows all visitors to feel safe.
5. Just because your dog is well trained and friendly, doesn't mean that everyone's is. Keeping your dog on a leash means it will be safe from other people's canine companions.
6. Leashes keep wildlife safe from a dog's natural instincts. Unleashed dogs can harass, injure, and sometimes kill wildlife.
7. Leashes keep historic sites and important ecological areas safe from digging and biting.
8. Unleashed dogs increase the probability that dogs may be banned from your favorite public lands.
9. A leashed dog's keen senses can enhance your awareness of nearby wildlife or other visitors.
10. It's not just a Rock Creek Park rule! D.C. policy states that any person with their dog off leash outside of specified dog parks can be fined or even imprisoned.

*Figure 6: Top Ten Reasons to Leash your Dog (NPS, 2017)*

park. There have been coyote sightings since 2004, but the exact number of the population is unknown (Coyote Frequently Asked Questions., 2015). Other animals in the park all year include Eastern Grey squirrels, flying squirrels, wood

thrush, woodpeckers, beavers, great blue heron, and opossums (Native Animals, n.d.). Living within a city alone places considerable stress on wildlife and surviving daily can be challenging (Barcus 2016). Off-leash dogs add to the stress. Moreover, unofficial trails are used as shortcuts from nearby neighborhoods into the park, putting dogs and people even closer to wildlife habitats. It is believed there are twice the number of these “social trails” as official, marked trails. When people, with or without dogs, walk down these trails they encourage erosion and sedimentation into the creeks and ponds and potentially disrupt nesting areas (Barcus 2016).

Dogs running off leash have an increased chance of running through restricted underbrush and disturbing fragile animal populations. Out of fear, animals relocate to different areas, placing more pressure and stress on wildlife. Specifically, dogs can create bare spots in the park, disturb ground-nesting birds and squirrels, and stir up sediment in spring ponds covering amphibian eggs, preventing sunlight from warming the eggs. Disturbances in the spring ponds have been noted as a reason for the decline in the frog population of ROCR (Barcus 2016).

Law enforcement inconsistencies resulted in a system where dog owners see other dog owners letting their pets off-leash without consequence, believing it must be ok to do the same. There has been an ongoing problem in ROCR with lack of leashing regulations that has grown over the years. Incidents have been reported, including dogs interfering with bikers, joggers, and horses on horse trails. Dogs have also been reported to upset children and bother visitors eating in picnic areas. Dogs also have been reported lost within ROCR. Many of these incidents are avoid-

able through leashing a dog. ROCR spokesperson explains that leash laws apply to all dogs because an otherwise properly behaved dog can act in an unpredictable manner given a particular situation (Roussey 2013).

In sum, the NPS understands there is a problem with dogs in ROCR but does not know the nature and extent of the problem or why dog walkers are not complying with the regulations. Moreover, park managers might benefit from a more comprehensive understanding of approaches others have taken. In what follows, we explain the methods we employed to better understand the problem and how to encourage better compliance.

## Methodology

The goal of this project was to develop a strategy National Park Service staff can use to improve compliance of leash laws within Rock Creek Park (ROCR). In addressing our five objectives, we used a number of methods as shown in Figure 7.

Building on our background research on the adverse impacts of dogs in parks (Objective 1), we used observations, interviews and focus groups to gather further information while on site. We used the findings from our research to propose strategies Rock Creek Park can implement to encourage leash compliance.

### Objective 1: Assess impacts of dogs in parks

We supplemented our background research on impacts of dogs in parks in general by interviewing a biologist, resource manager, and a Lands and GIS specialist to gain information

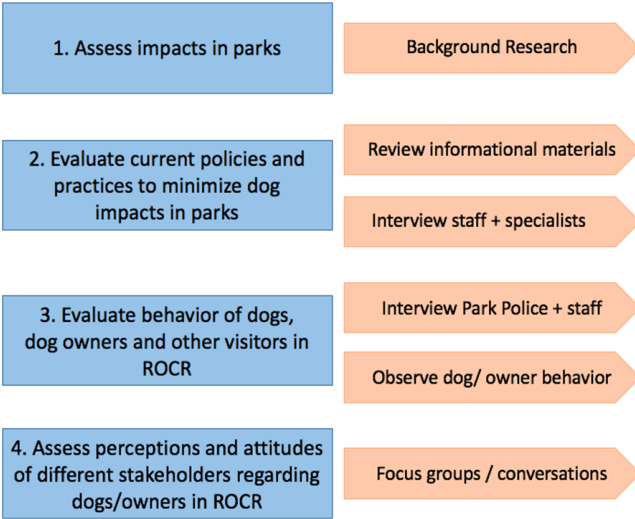


Figure 7. Overview of methods

about specific impacts of concern in ROCR (see Supplemental Materials B for a full interview list).

### Objective 2: Evaluate current policies and practices to minimize the impact of unleashed dogs in parks

Our second objective was to evaluate current policies and practices designed to minimize the impacts of off-leashed dogs in parks. We identified standard practices for informing owners about appropriate policies and behaviors as well as enforcement practices. We accomplished this objective through observing informational signs in ROCR, reviewing ROCR regulations on the website, and conducting interviews with National Park Service staff from ROCR and other parks.

We observed and documented the messages on the leashing policy in Rock Creek Park, in-

cluding signage, brochures, and website information. We took pictures of signage and recorded obstructions that might make it difficult to read the signs. For the brochures, we recorded the message on them and the locations where visitors can get the brochures. We also noted conflicting messages in signage and materials that might confuse visitors.

We interviewed Park Police and NPS staff to determine how the regulations on dogs are enforced and locations where most incidents occur. We interviewed a Volunteer Ambassador, Youth and Volunteer Program Coordinator and ROCR volunteers to understand the volunteer process in ROCR, recruitment methods, motivations of volunteers, and their roles and effectiveness in the park. To understand effective off-leash methods in other parks as well as other off-leash problems we interviewed multiple NPS staff members from other parks in the United States including Steamtown, Catoctin Mountain Park and Santa Monica. Stakeholders we interviewed were members of the horse center including riders, trainers and civilians who board their horses there. We had a focus group with the horse center staff to inform us of dog interactions with horses and the associated risks. Our interviews covered the following topics (see Supplemental Materials C for preamble and interview scripts):

- staff perspectives on problems and policies regarding off-leash dogs;
- inconsistencies in current messaging and enforcement; and,
- ways to improve compliance with dog regulations.



### **Objective 3: Evaluate behavior of dogs, dog owners, and other park users in key areas**

We evaluated the range of behaviors regarding off-leash dogs, owners, and other visitors within Rock Creek Park by reviewing additional literature and by conducting systematic observations of dogs, dog owners, and other visitors in various ROCR locations. Based on the feedback from interviews with ROCR staff, we selected a site (Figure 8) within the main body of ROCR (Military Field), as well as other sites that are not contiguous with ROCR but are under the jurisdiction of ROCR staff (Battery Kemble Park, Montrose Park, Dumbarton Oaks Park, and Meridian Hill Park). Based on their experience and local

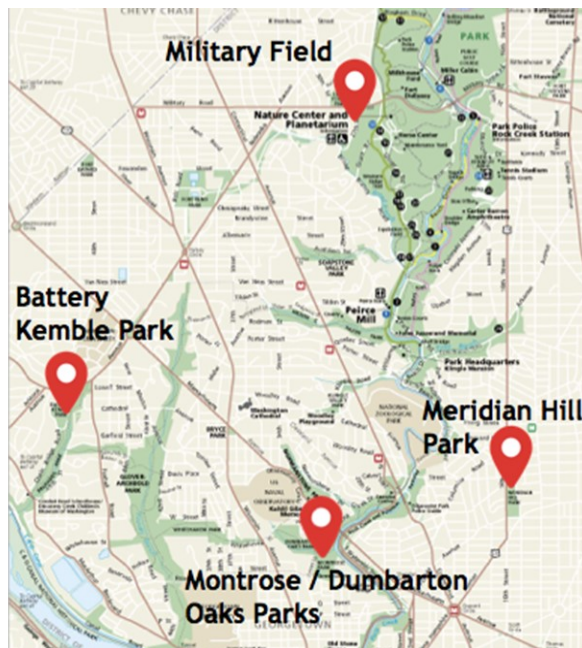


Figure 8. Observation locations (NPS, 2016)

knowledge, staff indicated that these areas often had high concentrations of dogs, including many off-leash. The following sections give more details on where and how we conducted the observations at each location.

### **Battery Kemble Park**

Located on the western side of D.C., Battery Kemble Park is largely covered by forest, and two main trails run through the park. We conducted our observations from the parking lot next to the open space in the northern part of the park where several formal and informal trails begin (Figure 9). We sat in the car during the observations to avoid being spotted by dog owners and to get a better view of the field without obstruction.



Figure 9. Observation location at Battery Kemble Park (Google Maps, 2018)

### **Montrose Park**

Montrose Park is a sixteen-acre park located in a residential neighborhood of

Georgetown in northwest Washington, D.C., (NPS, 2017). The park includes tennis courts, trails, playground and large open areas that NPS staff indicated were hot spots for dog walkers. We conducted our observations at the corner of the tennis courts with a good view of the open areas (Figure 10).

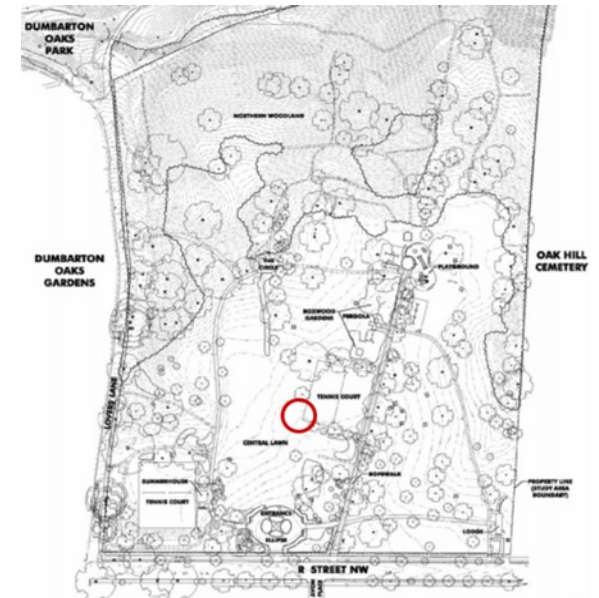


Figure 10. Observation location at Montrose Park (Montrose Park Cultural Landscape Report, 2004)

### **Dumbarton Oaks Park**

Dumbarton Oaks is adjacent to Montrose Park, but it is less ‘manicured’ and has a more rugged terrain, with a small stream and several trails (Figure 11). We conducted our observations in the middle of the park where there is a relatively large open area and good view of the trails and creek (see circled area in Figure 11).

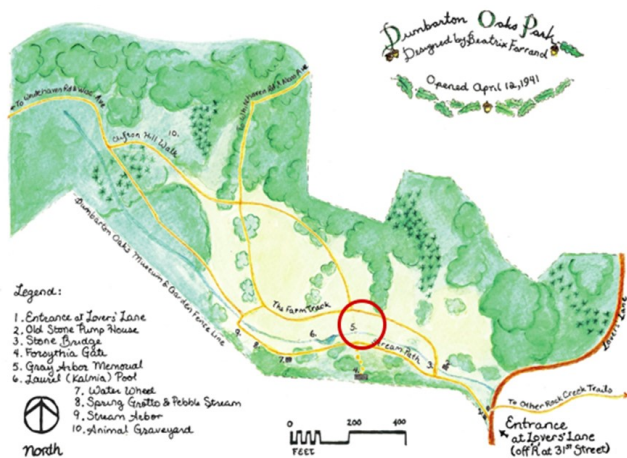


Figure 11. Trail map of Dumbarton Oaks Park (Dumbarton Oaks Park Conservancy, 2013)

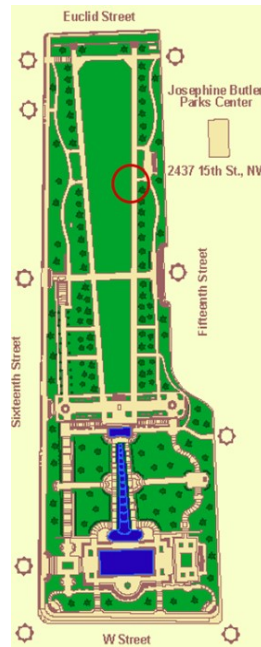


Figure 12. Map of Meridian Hill Park (Washington Parks and People, 2018)



Figure 13. Military Field (Circled in black) (Google Maps, 2018)

## Meridian Hill park

Meridian Hill Park is located in the northern part of the city. Unlike the other parks we observed, Meridian Hill is more formally landscaped with an upper and lower level. The park is surrounded by residential housing and major streets (16<sup>th</sup> Street to the west and 15<sup>th</sup> Street to the east), making Meridian Hill a high traffic area for pedestrians and dog walking (Figure 12). We conducted our observations from a picnic bench in the northern part of the park with a clear view of the major dog walking areas (see red circle on Figure 12).

## Military Field

Military Field is within the main body of Rock Creek Park near the Nature Center. It is a large open field near a parking lot with easy access to Military Road. One of the two major trails of ROCR, the Western Ridge Trail, runs through the Military Field and is an ideal spot for dog

owners because of access to the trail or field. We conducted our observations from the parking lot marked in Figure 13. The parking lot has a good view for both the open field and the Western Ridge Trailhead.

We developed a matrix to record our observations in the field. We noted the number of dogs with each walker, whether they were leashed or not, and if they responded when called. We also noted whether the owners were attentive to their dogs and picked up any dog waste. We noted if the dogs:

- disrupted fauna;
- approached other dogs;

- jumped on or approached other people;
- displayed aggressive behaviors;
- chased wildlife, cars, joggers, or bicycles;
- roamed in open areas; and
- disturbed any garbage.

We piloted the matrix in an initial observation session and adjusted the categories and our observational protocols accordingly. We then worked in pairs; one team member watched and narrated observations while the second member recorded them. We conducted 3-4 observations for each location, with each observation lasting for about 1 hour. We conducted observations at different times of day and on different days of the week, including weekdays, weekends, mornings, afternoons and evenings to ensure a broad sample of dog walkers.

## **Objective 4: Assess perceptions and attitudes of different stakeholders regarding off-leashed dogs and dog owners**

Our fourth objective was to assess perception and attitudes of different stakeholders about the problem of off-leash dogs and dog owners. These stakeholders included:

- Horse Center members/ staff;
- ROCR staff;
- Public visitors including dog owners/ non-dog owners.\*

Using interviews and focus groups we gathered information on the knowledge of off-leash risks and attitudes towards current regulations within the park. We conducted two focus groups to get a general opinion of behavior in the park and regulation concerns. Our focus groups included ROCR Horse Center Staff and riders, and ROCR Park Rangers. In order to gather people in the groups, we went to the horse center staff meeting and the park ranger staff meeting. We also interviewed some members of staff individually as well as a civilian horse rider who had concerns with the off-leash problem.

While observing in the parks we engaged in casual conversation with dog owners to get their perspective of other dogs and the rules. We kept conversations roughly 10 minutes long depending on the dog owners level of interest in talking with us. Our conversations occurred with

\*We initially hoped to gather public opinions through questionnaire surveys and in-person interviews, but we found that getting Park Service approval for a survey would take too long for the time frame of the project.

less than 9 people to ensure we were within guidelines with the NPS. We asked if they knew the rules, if they followed them, if not, why, and what their motives were for off-leashing their dog. (See Supplemental Materials C for the focus group preamble and scripts)

Based on this research, we recommended strategies ROCR might implement to improve the management of dogs in Rock Creek Park. In what follows, we report on our results.

## **Results**

In this section, we report our findings, many of which reinforced information we found in our background research. The research we conducted on-site provided more information on impacts, policies, practices, behaviors, and perspectives of varying stakeholders in the local context of Rock Creek Park.

### **Objective 1: Impact of Dogs in Rock Creek Park**

During initial interviews with resource managers and NPS rangers, we learned about the specific impact dogs have in ROCR. The creation of social trails and the spread of invasive plants are serious issues in the park that dogs, especially off-leash dogs, exacerbate. Joe Kish, the Land and GIS Specialist at ROCR told the team that there were about 20 major social trails in the park currently. Kish explained that off-leash dogs can “fragment” the forest when they either create or walk on social trails. Chasing deer has been noted to create social trails as it causes deer to rush through vegetated areas to get away from a dog, and dogs tend to widen or consolidate existing wildlife trails. Resource manager Ken Ferebee

explained off-leash dogs have the potential to spread invasive plants from areas entirely foreign to ROCR when they arrive at the park with pollen and seeds from a secondary location already on their fur. When a dog is off-leash they have the potential to go off-trail into the thicker underbrush and transfer seeds and pollens to nonnative areas. When they get into bushes, dogs may also disrupt birds. Some birds nest deeper in the forest where there are fewer human activities. The official park trails have been designed to leave these areas undisturbed, but social trails may run right through such areas.

From interviews, we learned about the “hot spots” for dog off-leashing based on rangers’ experiences. Rangers told us they typically see owners playing fetch with their dogs or letting the dog roam free with little attention to dog behavior. On trails, rangers often see dogs off-leash at a considerable distance from their owners. Rangers noted they get complaints about aggressive dogs off-leash, bothering other visitors, and some dogs are aggressive towards rangers. The ROCR horse center staff shared stories about aggressive behaviors they had experienced from off-leash dogs while riding on the trails and that off-leash dogs make them feel unsafe on the trails. One of the riders we talked to had broken two ribs after falling off a horse, and we heard of another who broke an arm.

### **Objective 2: Policies and Practices**

Observations and interviews allowed us understand signage in the park, but also how the regulations are enforced in the park by a variety of staff members in varying ways.

**Signage in ROCR**

The primary vehicle for educating the public on leash laws is through signage, brochures, and the NPS website, but these materials vary among parks. Signage in ROCR park was minimal, but clear. In most parking lots and entrances to parks, a large and clear sign informing people to leash dogs and pick up after dogs can be seen (Figure 14). At Battery Kemble, signage is placed at the



Figure 14. Dog signs in Dumbarton Oaks Park and Battery Kemble Park

entrance to the parking lot and the trailheads, yet we observed people unleashing their dogs right next to the sign. Dumbarton Oaks signage is only at the entry points to the park/trails. Montrose Park has large signs at the entryway stating to keep dogs leashed at all times. However, similar to behavior at Battery Kemble, visitors will off-leash their dog right next to signs at the front of the park. While the exact language varied slightly between signs, the team did not observe any confusing lan-

guage or damaged signs. Some signs throughout ROCR were small in size, but still readable. In main ROCR, signs at trailheads with regulations for walking on the trails note that pets need to be leashed on trails (Figure 15). At the horse center



Figure 15. Signs at trailheads in ROCR

within ROCR, a sign listing all regulations in the horse center, includes the statement that no dogs are allowed in the barn. This is placed right outside the barn where people constantly pass by. Most of these signs use an authoritative tone with wordings like “Dogs must be on leash at all times”. Signage is different in Meridian Hill Park.

**Signage emphasizes leashing regulations, but not the reasons why those regulations are in place.**

Here, information on leashing dogs is on a board with the park map and other regulations and information about the park, which is placed at all entrances on the upper area of the park. The information is in both English and Spanish and uses a softer tone by saying “Keep dogs on leash. Please clean up after pets.” All the signs above state only the regulations and not the

reasons to leash dogs. A flyer on the reasons is placed on the bulletin board right outside the ROCR nature center, shown in Figure 16, but the flyer is damp and not displayed in a prominent location. The language is legalistic and not compelling.



Figure 16. Flyer with reasons to leash dogs on bulletin board next to ROCR Nature Center

**Enforcing leash laws**

Different park officials, including Park Police Sergeants, NPS rangers, NPS resource managers, biologists, and horse staff noted wide variation among staff in approaches to the application and enforcement of dog policies and practices. While the ROCR rangers have more encounters with owners, only the Park Police have the authority to write citations, but few citations are issued. Park Police estimate they typically give out 1,000 warnings each year but only 20 citations. We were informed there is no systemat-

ic way to record warnings as they are often verbal, therefore repeat offenders of the rules cannot be tracked. The police explain they are reluctant to issue citations because, although the fine is small (\$25), even after payment the ticket appears on the violator's arrest record. All our interviewees agreed this was far too harsh a punishment for a relatively minor offence. Another police officer admitted it is not a police priority, and writing up a ticket is often not worth the time. Several interviewees were frustrated by the lack of enforcement of leash laws by police, and the apparent difference in priorities between park police and other park staff.

### How to approach owners

NPS staff, including rangers, resource managers, Park Police, volunteers, and horse center staff, emphasize the need to encourage owners to leash their dogs, but staff approach owners in different ways and emphasize different messages that range from stating the law to listing the reasons to leash dogs, including discussing hazards dogs may face in the park. For Park Police, their presence alone is often enough to get people to leash their dogs with no spoken interaction at all. Lt. Simeon Klebaner expressed that, "the off-leashing problem is a contentious problem for the park police" (personal communication, 11/30/18). Approaching owners about off-leashing can be very problematic due to the passionate nature of dog owners when it comes to their dog. Rangers typically feel respected by the public and have few confrontational conversations with owners when asking to leash a dog. When they do this, they try to approach owners in a non-confrontational manner since they believe it is more effective, but without a standardized message, it could lead to inconsistent interpretations.

As a result of inconsistencies, volunteers, rangers and other NPS staff said a universal persuasive message recited by all NPS members would result in more consistent enforcement.

### The BARK ranger program

While consistent enforcement is necessary to make all visitors in ROCR aware of the rules, persuasive reasoning and peer pressure will most likely yield positive change in habits. The BARK ranger program is as an effective peer pressure method to improve compliance. BARK ranger is a program introduced by the NPS. BARK rangers are "model animals that promote safe and fun visiting experience and also help the public understand how pets may affect park environment" (n.a., NPS). The dogs are ambassadors promoting park regulations and dog safety while walking the park. BARK rangers are identifiable by a bandana or leash and are friendly and informative volunteers for the general public (Figure 17). The BARK ranger program and vol-



Figure 17. BARK ranger Cooper (NPS, n.d.)

unteers rove are as of the park; an effective way for social peer pressure of dog owners to increase leash law compliance instead of law enforcement. A bandana or identifying marker is a great way to start a conversation between dog owners and spread aware-

ness about being a BARK ranger. BARK rangers are asked to engage in friendly, natural conversation with other dog owners about why the dog needs to be leashed at all times and to use peer pressure to persuade others to follow the rules. The use of the BARK ranger can motivate other people to want to volunteer and become a BARK ranger themselves with their dog. Research has supported that law enforcement is inconsistent and does not encourage alteration of behaviors.

Ron Harvey, Interpretive Ranger Volunteer Coordinator at Catoctin Mountain Park, explained how the innovative BARK ranger program had helped reduce off-leashing in the park. He claimed the program not only reduced off-leashing problems, but has been accepted by the public and has actually increased the number of dog activities in the park. He believes the program connects the park with the local dog communities and encourages dog owners to respect the park and park visitors. ROCR rangers believe the BARK ranger program could be a positive avenue to encourage a greater sense of responsibility among dog owners and increase compliance with leash laws.

Kerry Olsen, Acting Chief of Interpretation, Education and Volunteers for the Washington Office previously worked at Santa Monica Mountain National Park and explained how the BARK ranger program started there. It is important to recruit neighbors as BARK rangers since they are consistently in the parks and can effectively talk to neighbors who do not comply with the laws. In the beginning, they picked a certain number of volunteers for the program. The staff (rangers) had to ensure the dog was well trained, and there was a vet present to evaluate the dog's behavior. The dog needed to be friendly

with people and other dogs. Once the dog was approved for volunteering, the dog was given a bandana that displayed it as a “BARK Ranger”.

Further information on other NPS BARK ranger programs was discovered through social media searches on Instagram and Facebook. Both social media platforms had information on Glacier National Parks BARK ranger program and the Petrified Forests’ program. Both locations promoted the programs via social media. Petrified Forest specifically had an identification card that many owners took pictures of and posted on their social media to show excitement and pride for the program. The Glacier BARK ranger posts not only promoted leashing, but also park rules such as staying at a distance from wildlife and not littering in the park.

**Objective 3: Behaviors**

While ROCR park is a national park, multiple staff members suggested it is treated like a ‘backyard park’ by many visitors and not respected like iconic national parks such as Yellowstone or Glacier are. ROCR meanders through residential neighborhoods in northwest Washington DC and does not have ‘National’ in the name to distinguish it from ‘ordinary’ urban parks. The ROCR rangers want the public to understand the significance of a national park and to understand while some areas are small, not particularly wilderness-like and surrounded by urban housing, these “neighborhood parks”, are in fact protected land and should be treated as such.

After 19 observation sessions we conducted at five locations, we noticed several patterns in dog/owner behavior within each location and some patterns that were consistent across multiple locations. Different locations seemed to attract a

different number and type of dog walker. Locations like Meridian Hill Park, Battery Kemble Park and Montrose Park were all very popular, with an average of 15 dogs seen per hour. On the other hand, Military Field and Dumbarton Oaks Park, while reported by park staff as hot spots for dog issues, did not appear to attract many dog walkers, although this may reflect the fact that we were observing during the late fall (Figure 18).

*Leash law compliance rates varied significantly across different parks.*

Leash law compliance rates varied significantly across different parks (Figure 19). Battery Kemble, Montrose Park, and Dumbarton Oaks Park had very low leash law compliance, with more than 60% dogs off-leash, while less than 20% of dogs were off-leash in Meridian Hill and Military Field. The different topography and size of each park likely contributed to different behaviors in each park as well.

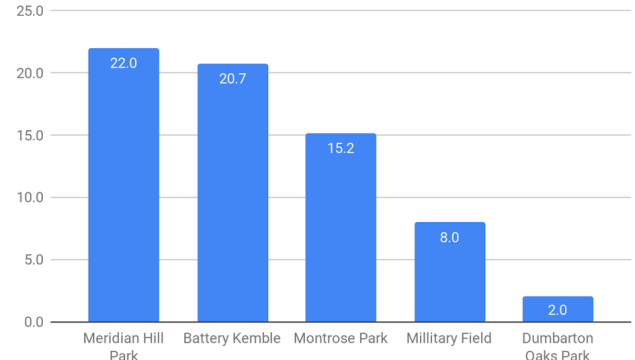


Figure 18. Average number of dogs per hour of observation at different locations

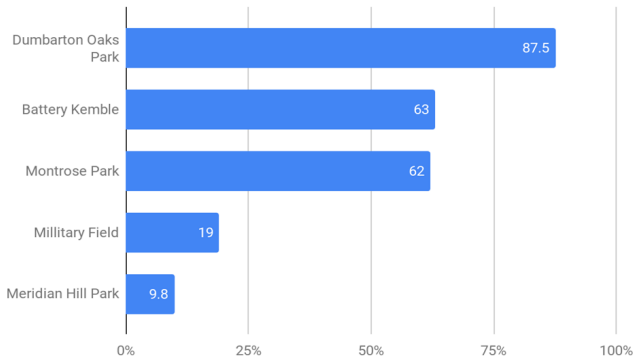


Figure 19. Percentage of dogs walking off-leash at different locations

Time of day is slightly related to whether people walk dogs off-leash (Table 1). More people walked their dogs off-leash around noon, while people who walked their dogs in the afternoon had a lower off-leash rate.

During the four observation sessions spanning 5.5 hours at Battery Kemble Park, the team observed 86 dogs (20.7 per hour) with 56 of them off leash, setting the off-leash rate at 63%. At Battery Kemble, it seems like the normal behavior is to let dogs walk off-leash, both on trails and in the open area near the parking lot. People are often seen arriving at the site with their dogs in a car, then letting their dogs run freely in the parking lot and open area nearby. We observed a lot of owners playing fetch with their dog at Battery Kemble. At Battery Kemble we noted some uncontrolled dogs off-leash that were not responding to their owner, approaching other dogs, and creating aggression between the dogs. During aggressive behaviors, the owners would react and separate the dogs, but the dogs would just approach each other immediately after. Some owners were also seen walking with their dogs on leash on the trail, but then unleashed their dog

Table 1. Observation Result Summary

		Battery Kemble	Montrose Park	Dumbarton Oaks	Meridian Hill	Military Field
Morning	Observation Time	2.5	2.5	1	2	1
	#Leashed	13	19	0	71	4
	#Unleashed	32	40	0	5	1
	%Off-leashed	71.1%	67.8%	0%	6.6%	20%
Noon	Observation Time (hour)	2	1.5	2	2	1.5
	#Leashed	17	4	1	24	2
	#Unleashed	24	8	7	3	0
	%Off-leashed	58.5%	66.7%	87.5%	11.1%	0%
Afternoon	Observation Time (hour)	1	2	1	2	2
	#Leashed	12	11	0	24	23
	#Unleashed	16	9	0	5	6
	%Off-leashed	57.1%	45%	0%	17.2%	26.1%
	Total observation time (hour)	5.5	6	4	6	4.5
	Total #Leashed	42	34	1	119	29
	Total #Unleashed	72	57	7	13	7
	Total #dogs	114	91	8	132	36
	Total dogs/hour	20.7	15.2	2	22	8
	Total #off-leash/hour	13.1	9.5	1.75	2.2	1.6
	%Off-leash	63.16%	62.64%	87.50%	9.85%	19.44%

once they entered the open area even with visible signage indicating dogs should be leashed (Figure 20).

In Montrose Park, the team observed 91 dogs over five observation sessions totaling six hours (15.2 per hour). Fifty-seven of those 91 (62%) were off-leashed. Forty of 57 dogs (70%) were off-leash in the morning. During early morning observations at Montrose, we observed many owners alone with their dog, playing fetch in the open field. This supports claims from park



Figure 20. Owner letting dog off-leash once entering the open field in Battery Kemble Park

police and rangers that owners typically off-leash their dogs for exercise. The team observed a social gathering of dog owners during morning and midday, where dog owners unleashed their dogs and let them roam in the open area while owners socialized with each other in the center of the field or at a picnic table. This resulted in owners not picking up waste after their dogs due to inattentiveness, and in dogs approaching other visitors. Afternoon behaviors were similar, but there did not appear to be such an emphasis on a social gathering or evidence that owners knew each other. Instead, they were at Montrose to let their dog socialize and walk around. The main behavioral problems we observed included being non-responsive to the owner, approaching other people, and approaching other dogs. The team witnessed off-leash dogs wander into the hedges that surrounded Montrose park, disappearing for several minutes before the owner seemed aware and called out for the dog.

Dumbarton Oaks Park is right next to Montrose Park, with a relatively big, open grassy area in the park and a creek that runs through the park. However, the team did not observe many dogs in Dumbarton Oaks. We observed only eight dogs in total and seven (87.5%) of them were off-leashed during three sessions, totaling four hours of observation (2 per hour). Two off-leashed dogs

**“Rock Creek is dirty and unsafe for humans or dogs to go into due to the bacteria in the creek, specifically fecal coliform.”**

— ROCR Resource Manager

Two off-leashed dogs

were roaming on the open field and three off-leashed dogs were swimming in the creek. The data show that that dogs were likely to go into the creek, especially when the creek was right next to the trail. We were told by resource manager Ken that the creek in ROCR is very dirty and unsafe for humans or dogs to go into due to the bacteria in the creek, specifically fecal coliform. The Dumbarton Oaks creek flows in Rock Creek and contains similar bacteria at lesser levels.

While Meridian Hill and Military Field were identified as “hot spots” for dog activity by NPS staff, we observed very infrequent off-leashing compared to other park locations observed. For three observation sessions totaling 4.5 hours in Military Field, the team observed 36 dogs in total (8 per hour) and only seven (19%) of them were off-leash, and only one was roaming off trail. The other off-leashed dogs were walking with their owner. Military Field was frequented by dog walkers who walked multiple dogs at once. Dog walkers were observed during midday and afternoon. In the mornings the team observed a singular owner with 1-2 dogs taking the dog on a walk on the trails.

Similarly in Meridian Hill, across the 132 dogs observed only 13 (9.8%) dogs were off-leash during four sessions over six hours (22 per hour). Most dogs observed on site were leashed and were walking with their owners on the path. The few dogs observed off-leash were oftentimes playing catch with their owners in the open field or playing with other dogs. The proportion of dogs off-leash does not vary significantly with regard to time of day, though off-leash dogs in the morning seemed to be interacting with each other more because they knew each other. The low rate of off-leash dogs is inconsistent with

high rate of complaints about dogs according to the park police. The team suspects that this might be resulted by the high number of other park visitors in the park, so even though there are not as many off-leash dogs, problems caused by these dogs are more likely to be reported.

#### **Objective 4: Stakeholder Perspectives**

After assessing and understanding the problems off-leashing has on ROCR, the opinions on off-leashing and impacts on specific stakeholders are reported below.

##### **NPS staff perspectives**

Rangers noted that there are rare cases of off-leash dogs killing deer in the park, but more commonly dogs chase and harass the deer. Nevertheless, this harassment stresses deer, and dogs chasing deer are at risk of getting lost or hurt in the park. Rangers understand that chasing deer is a natural instinct difficult to stop except by leashing. The high density of deer in the park results in increase opportunity for deer to come in contact with and be chased by off-leash dogs. All the rangers noted that searching for lost dogs is a frustrating waste of staff resources.

Park specialists also indicated that off-leashed dogs have hindered their daily work at the parks. Joe Kish, the Land and GIS Specialist said that once he was surveying with his equipment, an off-leash dog urinated on his equipment, which cost thousands of dollars. Mikaela Milton, the park biologist at Anacostia Park was doing a deer population survey and off-leashed dogs were scaring away the deer, making the survey result less accurate.

There is the risk for an off-leash dog to get into an altercation with another off-leash dog. A Park Police Sergeant noted that 90% of off-leash dogs he has seen do not appear to be well trained in his opinion. He stressed that owners need to take responsibility and be responsible dog owners and follow laws as well as properly train their animals and have authority to command them safely. The reason leashing requirement exists is that you cannot predict how a dog will react in any particular situation.

Park staff presume that owners unleash their dogs to allow them to exercise more freely. While the motives for off-leashing may appear harmless, the consequences for the dog may be harmful. ROCR resource manager Ken Ferebee explained that the risks for dogs off-leash include, “tick and Lyme disease, getting cut by glass in the creek, getting harmful bacteria on their fur and mouth from the creek and other injuries” (personal communication, 11/1/18). Off-leash dogs could get into fights with wildlife, such as raccoons and deer. Canine rabies is carried by raccoons and foxes in ROCR and can be transferred to dogs if they interact. With any wildlife interaction there is the potential injury or fatality to either the wildlife or the dog during a preventable altercation.

##### **Perceived risks around horses**

Speaking with horse center staff at ROCR revealed another serious hazard to dogs, riders and other visitors: spooked horses. The staff cited several incidents such as dogs chasing and spooking horse, holding on to a horses’ tail, barking around horses’ legs, as well as rustling in the bushes, spooking the horses. Specifically, one rider noted a man who purposefully let his dog



run after the horse as if it were some type of game. Another rider noted a dog on a retractable leash who got tangled in the horse's legs and the rider was fearful the horse would fall over and she would become trapped underneath. Many cited injuries sustained from a spooked horse as a result of an off-leash dog. These included broken ribs and a broken arm. Some riders also mentioned that their horses have even kicked dogs, but they were not aware of how this affected the dogs. Being kicked by a horse can result in severe injury to the dog and possible death.

### *Horses spooked by off-leash dogs have caused serious injuries in ROCR.*

All the riders reported unsavory moments between riders and dog owners over the years. They all mentioned being yelled at to, "get off the trails with your horses." Riders are often as upset by this lack of respect as they are about the possible dangers to horses and riders. The riders believe there is a lack of education for visitors on horse etiquette. Many riders and trainers stressed dog owners do not comprehend how to handle their dog around a horse and have a lack of respect for the riders in general. For example, owners will hide behind a tree either so the rider cannot see they are holding the dog's collar, not a leash, or because they think that is the safest way to be at a distance from a horse. In fact, hiding behind a tree actually stresses the horse out even more since they cannot see the source of noise. On the trails, all visitors, with or without a dog, have to move over to the side when a horse passes, however this common courtesy rule is not known to visitors. The horse center noted multiple incidents

of dogs running into the equitation ring during lessons and causing disturbances. When the staff calls the police to deal with the incident it is either too difficult to find the owners or it is the visitors story versus the staff story. Often times reporting to the police yields no change. Due to this, the riders have taken protocols into their own hands which include desensitizing their horses to be less spooked when encountering a horse.

The horse center staff expressed a common theme for dog off-leash incidents: lack of respect and knowledge for horses. They have people walking into their barns, sometimes with dogs, not paying attention to signage at all. They think the public needs to be more aware that the horses have priority on the bridle trails and how to act when encountering a horse on a trail. They believe for the safety of riders and horses some type of education program and improved signage needs to be developed so the general public understands how to appropriately act around the horses. The staff suggested getting a group of volunteers to help enforce the leash laws could be a potential solution.

### **Volunteer perspectives**

Katie and Nick informed us that ROCR has approximately 9,000 volunteers participating in one volunteer event held throughout the year. These volunteers often participate in a large volunteer event, and they have reported some problems with dogs. During an event at Battery Kemble working on the trails, off-leash dogs kept approaching volunteers and bothering them and the work they were trying to do. ROCR has over 1,000 recurring volunteers yearly and a core group of 50-100 volunteers who work 200 hours a year for ROCR. There is more volunteering on the weekends; but still a volunteer presence on

the weekdays.

### **Dog owner perceptions**

In our literary research, we learned about owners having split opinions on dogs in parks, and our interviews and conversations with dog owners reflect this idea in Rock Creek Park. We were able to get dog owners' perspective on off-leashing and motives behind leashing through interviews and casual conversations in the park. ROCR volunteer Erik, who is a dog owner, always leashes his dog because he is concerned about his dog's health and he cares about the natural environment. He would like to let his dog off leash and socialize with other dogs in dog parks, but one major reason he doesn't is that some dog parks don't have specific small dog area. Erik thinks it can be unsafe for his smaller dog to be off-leash with larger dogs that can intimidate and hurt his dog even if they are simply playing. He mentioned the Capitol Hill Cemetery dog park and Shirlington dog park as examples of good dog parks where volunteers could redirect owners.

Along with Erik, we also engaged in casual conversations with five people we saw walking dogs off-leash in the park. We wanted to get an idea for how they felt about the policies and why they chose the particular park as a place to take their dog. After talking with the owners it became clearer why the park was attractive: it's close by, it has large areas that can fit multiple dogs running around, and the space isn't being used by anyone. Multiple owners we talked to noted a main motivator was the large pieces of unused open field; specifically in Battery Kemble and Montrose Park. One owner we talked to said she was not from the area and was unaware of the rules; another stated that she knew the rules but

that she wouldn't cause too much trouble with other people or dogs and to keep her dog away from unknown dogs. Both of them mentioned that their dogs were, "pretty well behaved" but they had seen their share of inattentive owners and poorly behaved dogs. Another owner talked about why the rule doesn't make sense due to the fact that any dangers (such as ticks) that are present in the open field would be present whether the dog was on-leash or off-leash and said "[unleashing] should be fine as long as your dog is under your verbal control."

When asked in an online forum about thoughts on the parks, one user said they "despise the NPS" because the NPS "manages them like national parks rather than as local parks, which is what they should be run as." If others have the same opinion, it may be hard to get them to comply with the leash laws because they don't respect the park and are unable to see it as something that needs to be preserved. These people would most likely benefit from peer pressure, because their distaste for the Park Service may cause them to disregard rules and authority figures enforcing it such as rangers and Park Police.

Another commenter argued for the laws, saying that you don't know other dogs. They could be friendly, or aggressive, and if the latter, by not being on a leash the dog poses a hazard to anyone it comes in contact with. The laws make public areas safe for other dog, people, and children.

## Conclusion and Recommendations

We drew five key conclusions from our interviews, observations, and literature review:

1. The most effective persuasive messaging focuses on dog owners' personal motivations (i.e., protecting their dogs) and social norms (i.e., being respectful of neighbors); communicating with empathy rather than threats may be more effective;
2. Messaging in the park has been primarily regulations-based and authoritative; verbal messaging and enforcement has been inconsistent;
3. BARK Ranger programs have been successful in other parks;
4. Social media is an easy, low cost way to reach a wide audience and educate and involve the general public on issues;
5. One serious impact of off-leash dogs has been horse-related injury on trails. Dog owners may not be aware of the dangers of a spooked horse and of horse etiquette.

Based on these conclusions, the team has developed multiple deliverables ROCR may implement to improving leash law compliance in the park.

### Universal message

A universal message was developed by the team to help Rock Creek Park staff, volunteers and Park Police when directly approaching dog owners with off-leash dogs. This message is short to be easily memorized, friendly and kind in tone and contains information on how leashing is beneficial and safe to the dogs themselves (Figure 21).

Through the message, we hope to convey to dog owners a more consistent and personal message on the importance of leashing.

*"Hi, I have noticed you're having a good time with your dog here. I just wanted to remind you that dogs have been known to chase wildlife and get lost. Your dog may also be susceptible to Lyme disease from ticks and rabies from wildlife in the park. ROCR requires all pets be leashed in the park to keep dogs and visitors safe. We would really appreciate if you could help us protect our park and I'm sure your dog will appreciate being kept safe. Hope you and your dog enjoy your walk here!"*

Figure 21. Universal Message

### BARK ranger

We recommend the implementation of a BARK ranger program in ROCR as a strategy to improve leash compliance. We recommend starting initially in 1-2 locations to establish the program and to see if there are any improvements to compliance rates before spreading the program.

While Battery Kemble, Montrose Park and Dumbarton Oaks has a higher off-leashing rate, Meridian Hill has more pedestrian traffic and more leash law compliance as a whole, making it an ideal location to recruit residents into the BARK ranger program. However, all 5 locations would need recruitment to make sure volunteers of the program were spread out between the "hot spots" and that volunteers consist of visitors who consistently use those parts of the park and who are familiar to other dog owners there.

The BARK ranger program should begin at 1-2 locations as a pilot, to develop and assess the program further and get it working. We rec-

ommend targeting the main body of ROCR as the first location for recruitment to target Military Field and the trails throughout. The second site we recommend selecting is Battery Kemble, Montrose Park, or Meridan Hill. All locations had high numbers of visitor traffic to be an effective place of recruitment for the program. After recruitment, it is important to make sure the BARK rangers are properly trained and understand the protocols of the park. We have developed training guidelines and important rules for being a BARK ranger (See Supplemental Material E). For BARK ranger training, owners need to prove that their dog is healthy and able to follow verbal commands. We recommend a vet or dog trainer professional is present at the training to gauge a dog's obedience. During the training, a group training session is necessary to show if the dog is friendly to other people as well as other dogs. In the training session, volunteer coordinators will teach owners rules and guidelines for being a BARK ranger and how to appropriately approach park visitors and safely discuss the leashing regulations.

To give owners ownership of the park, we developed some messages for the volunteers to say when they see owners. Varying topography and hazards in the parks require different messages for some satellite parks compared to the universal message for ROCR proper.

1. Montrose Park: *“Hi there! While I love the grassy areas here for my dog, I keep him leashed due to the surrounding streets. The last thing I would ever want is for my dog or another to get hit by a car so I always encourage leashing. You never know what might send your dog running!”*

2. Battery Kemble: *“While I love the grassy areas here for my dog, I keep him leashed due to parking lot here in Battery Kemble. The last thing I would ever want is for my dog or another to get hit by a car so I always encourage leashing. The trails here also have protected plants along the trails that could irritate your dog if they get into it so it's best to keep the dog leashed.”*

3. Meridian Hill: *“Hi there! While I love walking my dog on this side walk, I keep him leashed due to the surrounding streets. The last thing I would ever want is for my dog or another to get hit by a car so I always encourage leashing. You never know what might send your dog running!”*

ROCR can promote the program by giving BARK rangers a calling card (Figure 22) that encourages owners to display it in pictures identify-

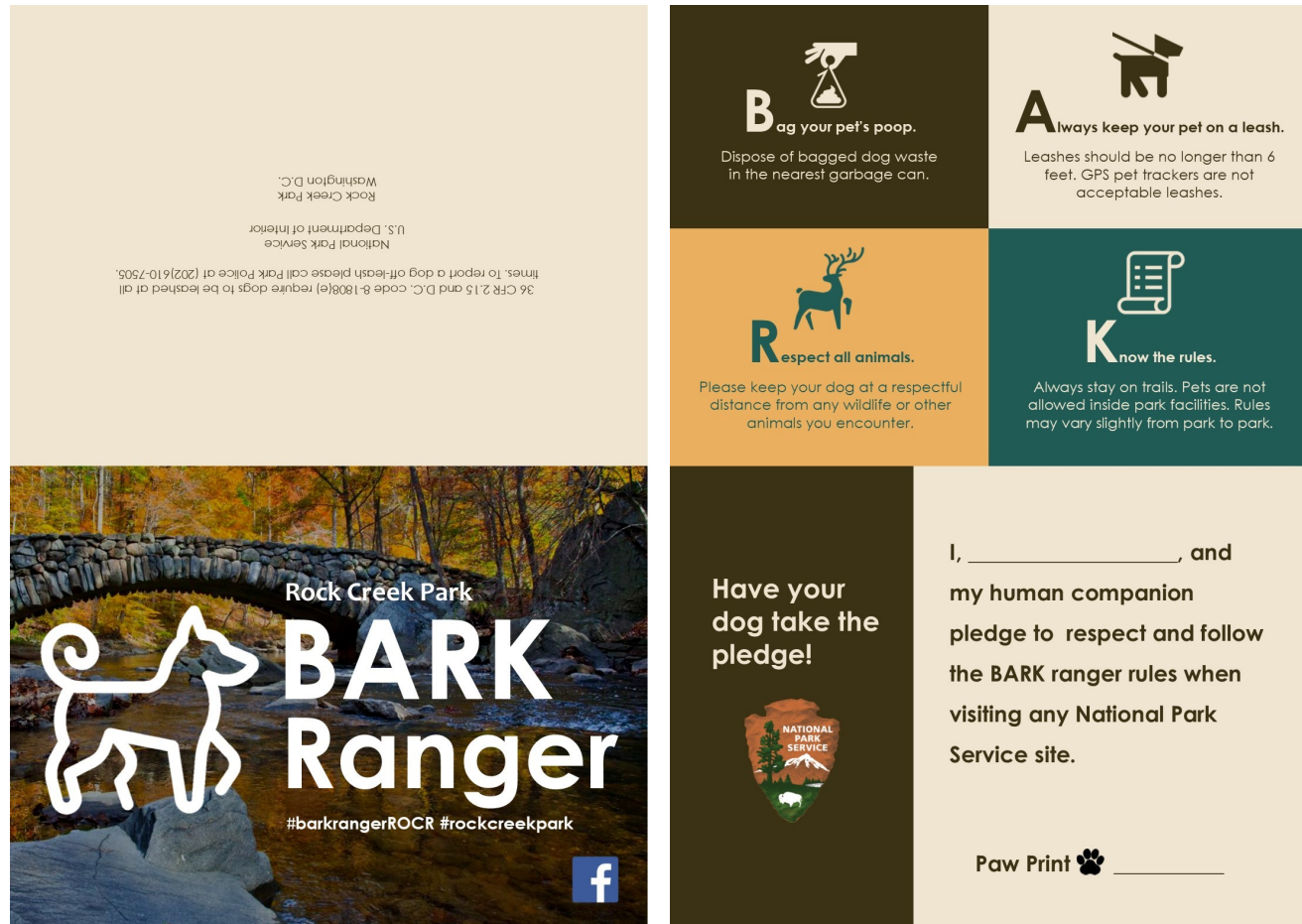


Figure 22. Social media calling card for BARK ranger program

ing their dogs as rangers on social media. Utilizing social media can show pride and enthusiasm for the program as well as promote the program further. Petrified Forest National Park uses this calling card to promote their BARK ranger program and a quick search yielded many posts on Instagram and Facebook. Our calling card is big enough to appear in a photograph and is also informative on the inside. The interior of the card reminds the owner of the BARK ranger rules and policies and gives a sense of ownership of the park by having the dog and owner take a pledge to be a positive ambassador for the park and park regulations.

**Social Media**

Our recommendation is for ROCR to develop a social media presence, using their Facebook, to not only educate the public about the hazards of off-leash dogs, but to use it as a positive reinforcement tool by ‘spotlighting’ people and dogs demonstrating good behavior in the parks (Figure 23). By promoting good behavior,



Figure 23. Social media post promoting leashing and BARK ranger program

owners may want their dog to be spotlighted as well, encouraging proper leashing habits.

In order to promote good behavior and raise awareness of issues such as conservation and wildlife protection, Glacier National Park has been using Instagram as a way of effectively communicating to the public. Glacier National Park had a reported 3.3m visitors in 2017, and they currently have 666,000 followers on Instagram, with average “Likes” reaching 11,000. Rock Creek Park had ~2.4 million visitors in 2017, so should be able to reach around the same number of people with their posts (Annual Park Recreation Visitation (1904 - Last Calendar Year), 2017). Reaching a wide audience is an effective way to educate the public on risks and hazards and positively promote good dog behavior in the park. Engagement can also be achieved through the use of a few hashtags we developed:

- #rockcreekpark
- #barkrangerROCR
- #DCdogs
- #dogswithjobs

Using the above hashtags in social media will not only allow these posts to be searchable by other social media users, increasing public awareness of the programs, but also allow the NPS staff to see the public's post on the program by searching the hashtags. The employment of the hashtags will allow the public and staff to engage via social media and see each other's posts. Following these hashtags will allow rangers to get images of dogs to promote proper leashing habits in

ROCR.

We have created varying types of Facebook and Instagram posts for the staff to rotate through over the year. Twenty posts were developed, 10 positive posts, promoting the BARK ranger program and fun at the park, and 10 negative posts, highlighting the danger and risks to an off-leash dog. A subset of these posts highlight seasonal-related dangers. Spring we recommend posting information about ticks and wildlife in the park. In the summer we have posts promoting use of designated trails and warning owners to keep staying out of the creek for the dog's protection. The fall highlights the deer population in the park calling attention to how off-leash dogs can harm deer and get lost while chasing deer. For winter, we developed posts encouraging visitors to stay on trails in order to protect the fauna (See supplemental material F). Posts can be from pictures taken by the staff or from images sent in by visitors. We hope the implementation of the BARK ranger calling card and hashtags will create audience engagement and participation from BARK rangers on social media. Effective use of social media creates positive peer pressure and it normalizes good behavior.

We also recommend the ROCR staff use personal testimonials that evoke emotional response and urge dog owners to comply with laws and leash their dogs. On the ROCR website it would be powerful to post a testimonial warning of the danger of off-leash dogs. For example, we have a testimonial from a horse rider at ROCR who recounts a terrifying encounter with an aggressive off-leash dog and owner as the dog spooked the horse she was riding (See Figure. 24). What makes this story powerful is placing a name and face to the dangers of a spooked horse.



Private horse rider Saralee was walking along Rock Creek with her horse when without warning, Prince reared, squealed, bucked and bolted as there was a dog underneath him, attempting to bite his legs. She recalls: "The dog made no noise but gave chase as Prince bolted... We had just rounded a corner, when Prince spooked and as I looked behind, the dog was almost at Prince's hind legs, again silent. His owner had let dog spool out length of very long retractable lead. I pulled off trail, turned Prince to face the dog and owner."

Figure 24. Example testimonial regarding spooked horses

Owners can understand how off-leashing their dogs directly affects another park visitor, persuading them to alter behavior.

### Educational pamphlets

Due to absence of educational materials specifically for leashing dogs and dog behavior in ROCR, our team has developed a pamphlet specifically addressing these issues. This pamphlet contains information on rules and regulations in the park regarding dogs, reasons why it is good for the dog and the park to following these rules, proper horse etiquette when walking with dogs on bridle trails, and a brief promotion for the BARK ranger program (Figure 25). The pamphlet is designed to be of size of a name card so it is easy to pick up and put in a pocket. would be interesting to keep and easy to carry around. The new pamphlet could be distributed in ROCR, on display in the nature center and distributed at local vet offices to increase visibility. For further improvement on the pamphlet, information about facilities for dogs in ROCR (e.g. dog water fountains) and off-leash dog parks could be included to make the pamphlet more helpful for dog owner visitors.



Dogs in Rock Creek Park 101

**Please keep your dog on a leash at all times**

Dogs should be physically restricted. Leashes should be no longer than 4 feet. Please don't use GPS pet trackers as leashes.

Your dog could easily get lost when off-leash. Multiple dogs has been lost in Rock Creek Park running off-leash.

Bodies of water such as Rock Creek contains bacteria that may harm your dog.

Help us protect your park by not disturbing wildlife and other visitors.

**Pet waste is a nuisance and may harm the environment. Please pick up after your pet.**

Dispose of bagged dog waste in the nearest garbage can. Please don't leave poop bags on the trail.

**Bag your pet's poop**



Figure 25. User friendly pamphlet for dog owners

For further public education on horse etiquette on the trails, we created an insert for the main ROCR trail brochure listing key trail etiquette regarding horses (Figure 26). Inserting the rules into the already existing popular trails brochure will not only be cost effective, but also will reach more visitors since it is already in the most

**Stay on trails**

Avoid Lyme disease from ticks and rabid racoons by keeping your dog on leash and on trail.

Walking off trail create social trails that fragment the forest and reduce nesting area for local birds.

Your friendly dog can scare wildlife up to 200 feet away. Please help us preserve the natural environment by staying on trails.

**Horse etiquette**


You may encounter horses when walking on bridle paths in the park. Please follow these rules to keep you and your dog safe:

1. Always give horses the right of way. Step to the side of the trail until the horses pass.
2. Pick your dog up or hold it by its collar. Keep you and your pet visible to the horse so the horse can identify any source of noise made. Horses spook easily, and an animal running around could scare it, causing injury to a rider, your dog, or the horse.
3. When passing a horse from behind, alert the rider, and wait for permission before passing.

Want to promote good dog behavior in the park? Ask a park ranger about our BARK ranger program or visit [insert BARK Ranger webpage](#).

National Park Service  
U.S. Department of the Interior

Rock Creek Park  
Washington, DC



popular brochure at the park. Being in the popular trail brochure will not only reach dog owners, but also general park visitors as well. The horse center told us that the public as a whole needs to be aware of horse etiquette (See supplemental materials G for more details).

### How to have a safe hike in the park...

1. Use this map and guide. (*There aren't many signs along trails in the park.*)
2. Stay hydrated—bring and drink water. (*Water is available at the Nature Center when open.*)
3. Stay on the trail to avoid poison ivy and ticks.
4. Keep your dog on a leash at all times. (*This protects both your pet and park wildlife. Many park users are afraid of dogs.*)
5. Dress appropriately (wear sturdy shoes, dress in layers and anticipate cold and wet weather)

#### Horse Trail Etiquette

1. **Always** give horses the right of way. Step to the side of the trail until horses pass.
2. If you have a pet with you, pick it up or hold it by its collar. Keep you and your pet visible to the horse so the horse can identify any source of noise made. Horses spook easily, and an animal running around could scare it, causing injury to a rider, the horse, or your dog.
3. When passing horse from behind, alert the rider, and wait for permission before passing.
4. Keep children close when walking on bridle trails

These rules are not just for the horses' safety, but also for yours!

Figure 26. Horse Trail Etiquette Amendment to Hike Brochure

## Acknowledgements

*We would like to thank our sponsors Dana Dierkes and Frank Young for their constant encouragement and help along the way. We also would like to thank all those that spoke to us:*

*Julia Washburn  
Sergeant Stewart  
Lt Simeon Klebaner  
Ken Ferebee  
Mathew Carroll  
Mikaila Milton  
Kathryn Tyler  
Nick Solomon  
Joe Kish  
Ron Harvey Jr.  
Kerry Olsen  
Eric Taylor  
Lenny Teh  
Horse Center Staff  
Maggie, Tony, Jeff, Renee & Jeanne*

*Finally, we would like to thank professors Golding and Higgins for their assistance and support throughout the 14 weeks.*

**Supplemental Materials for this project may be found at <https://digitalcommons.wpi.edu/studentprojectsandresearch/> by entering this report's title in the search bar. When the window appears, click on the appropriate project title and scroll down to "additional files".**

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### **Icons used in the BARK ranger card and dog owner pamphlet**

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