AN ANALYSIS OF VISITOR CONFLICT AT HEADWATERS FOREST RESERVE,
HUMBOLDT COUNTY, CALIFORNIA

By

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ABSTRACT

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Headwaters Forest Reserve (HFR) has existed since 1999, when the Bureau of Land Management purchased remnants of old-growth forestland from Pacific Lumber Company. The area provides numerous recreation opportunities, including hiking and dog walking. High visitor numbers combined with many different user group types seeking different experience outcomes often leads to conflict, and in recent years instances of human-dog conflict have increased. To assess the nature of human-dog conflict at HFR, 434 visitors to the area were surveyed from May 26 to September 16, 2012. The survey had two components, an on-site interview, and a written survey that was mailed to participants and then mailed back upon completion. Participants were asked about the quality of their visit, agreement with proposed area management strategies, and opinions on the current dog policy. Results showed about 20% of respondents reported conflict between humans and dogs, with figures higher for those visitors who didn’t bring dogs. Significant differences in attitudes about potential management techniques were also found between visitors who bring dogs to HFR and visitors who don’t, with visitors who bring dogs less receptive to more restrictions placed on dogs at HFR. I propose potential management techniques to alleviate conflict by
adjusting attitudes of visitors through changing social norms, which includes increasing visitor education and increased enforcement of regulations.
I would first like to thank my advisor, Dr Steven Martin, for guiding me on this long journey and helping me escape unscathed. I would like to thank my committee members, Dr. Yvonne Everett and Dr. Laurie Richmond, and former committee member Dr. Paul Marsh, for their unwavering support. I would like to thank all members of the Bureau of Land Management Arcata office, specifically former Headwaters Forest Reserve manager (and current field manager) Chris Heppe, current HFR manager Ben Blom, HFR ranger Julie Clark, 2012 summer assistant HFR ranger Emily Afriat, Leisyka Parrott, Bruce Cann, and all other staff who helped with this project. I am grateful to all visitors to HFR who were kind enough to take the time to participate in this study and trust a stranger with their opinions. I am grateful also to Danielle Trapkus, who was able to help me with just about any type of office-related issue I had, and Jessica Blackwell, whose knowledge of survey procedure made her assistance invaluable. Finally, without my friends and family, I would not be where I am now, and to them I am eternally thankful.
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INTRODUCTION

The history of Headwaters Forest Reserve (HFR) is defined by conflict. The lands that comprise the ecological reserve have had several tenants over the course of the last century, and also much turmoil. Logging of HFR lands began in 1884, when a man named Noah Falk established a small logging operation along the Elk River. The town of Falk eventually ballooned to 400 occupants, but a number of factors led to the decline of timber production in the town, and eventual closure of the mill in 1937. A small population remained after the closure of the mill, but the town never recovered, with most of the town buildings finally being razed in 1979. The timberlands were privately owned and logged by the Pacific Lumber Company (PALCO) until their acquisition by the Bureau of Land Management (BLM) in 1999, but tension existed between PALCO and environmental advocacy groups in the years prior to the BLM’s acquisition. In 1985, PALCO was acquired by Maxxam Corp., which promptly implemented an unsustainable clear-cut logging plan designed to make as much short-term money as possible to help pay off the purchase of PALCO (Wilent 2008). The new policy was met with heavy backlash from environmental groups, culminating in the “Redwood Summer” protests of 1990, which brought Maxxam’s unsustainable harvest practices to the public eye. Environmental groups demanded action be taken to preserve remaining old-growth redwood forest on PALCO land. After years of conflict between Maxxam and environmental advocacy groups, the Department of the Interior struck a deal with
PALCO in 1996 to acquire the land and preserve it as an ecological reserve managed by the BLM. The reserve was officially established and opened to the public in 1999.

While political conflict has played an integral role in shaping the identity of Headwaters Forest Reserve, the primary purpose of this study is to assess potential conflict that may exist between recreational user groups who visit the reserve, with an emphasis on determining the levels of conflict between visitors who bring dogs to the reserve and visitors who do not. Recently, the BLM reexamined its current dog policy for HFR, which allows for unleashed dogs at the reserve as long as they are under voice control, and determined that if there is enough conflict at the reserve, the policy might be made more restrictive. User conflict has been a prevalent topic in outdoor recreation research for many years, and major descriptive studies have been conducted since the 1960s as recreation became more popular (Williams 1993). These descriptive studies identified trends in recreation conflict, like asymmetric or “one-way” user group conflict, in which one user group is more tolerant of interacting with a different user group type than vice versa (Knopp et al. 1973, Shelby 1980). Current studies show this pattern still is quite prevalent within recreation conflict (Vaske et al. 2007). Before 1980, such studies failed to suggest any theoretical models addressing origins of user conflict, in spite of all the published data. Jacob and Schreyer (1980) published the first thorough theoretical model for recreation conflict, typically described as the “goal interference” model. The authors defined conflict as “goal interference attributed to another’s behavior” and used this definition as the foundation for their model (Jacob and Schreyer 1980, pg. 369). Their definition is founded in both expectancy theory, which postulates that human
behavior, including recreational behavior, is goal oriented (Manning 2011), and discrepancy theory, which states that dissatisfaction in outdoor recreation occurs as a result of the discrepancy between desired and achieved goals (Jacob and Schreyer 1980, pg. 369). From their definition of “goal interference,” Jacob and Schreyer derived four primary factors that may contribute to recreation conflict.

The first of these factors is “activity style” which refers to an individual’s personal investment in a particular recreation activity. For example, some people enjoy multi-day backpacking trips, while others prefer only doing half-day hikes; while they both are participating in hiking, they are doing so at different levels of intensity. Variables affecting “activity style” include intensity of participation, social status (especially within the recreation community), and range of experience and definitions of quality. The second factor is “resource specificity” which refers to the personal significance assigned to a specific recreation resource for a particular recreation experience. Variables affecting this factor include evaluations of resource quality, sense of possession, and status. The third factor is “mode of experience”, which is essentially how an individual perceives the environment over the course of their entire recreation experience. Expanding on these previous two factors, Mitchell et al. (1993) found that visitors to an area of national forest in Washington generally had one of two types of attachments to natural places visited on a regular basis. One type is a utilitarian attachment, where the visitor’s activity (hiking, mushroom picking etc.) is valued more than the place, which simply provides a setting for the activity. Some visiting mushroom pickers were quoted as saying if the mushrooms disappeared from the area, they would
simply find another place to look for them. The other type is an emotional attachment, where the place itself is the reason for the visit, and is valued over the activity due to emotional and spiritual connections (i.e. the visitor has been coming to the area with their family since they were a child). The fourth and final of Jacob and Schreyer’s factors is “lifestyle tolerance”, which is the ability of an individual to tolerate lifestyles, expressed through styles of recreation, that are different from their own. Variables affecting this factor are an individual’s inherent prejudices and differences in technology and resource consumption; while some people use technology to recreate, others utilize outdoor recreation as a means to escape it. Associated with one’s tolerance of technology in recreation are differing sets of norms for appropriate behavior while recreating. Thus, several studies have unearthed recreation conflict between users of “low-technology” equipment like skis and canoes, and users of “high-technology” equipment like motorboats and snowmobiles (Lucas 1964, Vaske et al. 2007). A synthesis of these factors with the concept of “goal interference” resulted in Jacob and Schreyer (1980) developing ten “propositions” of conflict, or, in other words, ten sets of conditions under which conflict would be most likely to develop in a recreation setting.

A second theoretical model of recreation conflict arose in the mid-1990s and is typically called “social values” conflict (Vaske et al. 1995). This model bases conflict on interactions between users with fundamentally dissimilar recreation, lifestyle, and social values. Unlike Jacob and Schreyer’s model, this model is predicated on deeply fundamental personal beliefs, so conflict is not necessitated by physical interaction between users. However, these models are not mutually exclusive, and are observed
interacting in some empirical studies. Furthermore, some researchers (Manning 2011) believe that the “social values” model is simply a different interpretation of “lifestyle tolerance”, the fourth conflict factor in Jacob and Schreyer’s model.

The development of these two theoretical models fueled future empirical studies of conflict by providing researchers with fundamental models through which they could process their data. Now, data could be scrutinized and analyzed even more thoroughly than before, and researchers were able to see how well the components of the models were represented in their data. Specifically, Jacob and Schreyer’s “goal interference” model inspired researchers to conduct studies specifically designed to assess the influence of the model’s four primary factors on recreation experiences and user conflict (Watson et al. 1994, Vaske et al. 2000). Many studies discovered that at least one of the four factors was present and affected conflict. Other studies found additional factors affecting conflict, such as user perceptions of personal safety (Blahna et al. 1995, Vaske et al. 2000). Empirical studies focusing on the “social values” model also found additional variables affecting conflict. A study by Watson et al. (1994) on conflict between hikers and recreational stock users in the John Muir Wilderness employed 17 different variables, all based on the four primary factors listed by Jacob and Schreyer.

A synthesis of theoretical and empirical studies resulted in a developed model of conflict as seen in Manning (2011). The expanded model incorporates the four factors from Jacob and Schreyer’s model and adds two additional variables, “expectations” and “safety”, both of which were found in empirical studies to be significant and distinct from the four original factors (Blahna et al. 1995, Vaske et al. 2000). Combining these factors
creates “sensitivity to conflict”, a concept that is different from conflict itself, and typically precedes it. An individual’s or group’s predisposition to experience conflict during a recreation visit is directly influenced by whatever particular combination of those six factors is present at the time. This predisposition is also influenced by the occurrence of “goal interference” itself, whether through direct means (interpersonal conflict) or indirect means (social values conflict). An individual’s or group’s level of conflict is also affected by their ability to cope with conflict. Theoretically, the better a user or user group is able to cope with conflict, the less dissatisfaction they will report from their visit. Schneider and Hammitt (1995) detailed a conceptual approach to visitor response to outdoor recreation conflict that included the use of coping mechanisms. Their model is adapted from a model proposed by Lazarus and Folkman (1984), which details basic psychological human responses to stressful incidents. Schneider and Hammitt used the same template and same construction as Lazarus and Folkman’s model while substituting recreational stress factors for the general psychological factors used in the original model, and came to the same general conclusion about how visitors use different strategies to cope with varying stressful situations, and how both of those factors influence a visitor’s experience, likelihood of return visits and public support for an area (Schneider et al. 1995). Much like Jacob and Schreyer’s groundbreaking model, Schneider and Hammitt’s model provides an excellent foundation for studies on visitors’ coping behaviors. Very little empirical research has been done on coping, however, and more is necessary to test the model.
Headwaters Forest Reserve is a fertile location for studying recreation conflict, as the area experiences both high numbers of user visits as well as many different user groups. Martin and Widner (2000) conducted the first visitor survey in the summer of 1999, soon after the area was opened to the public in March of that year. As illustrated in the final report of that study, visitor use was spread over a wide range of activities. While hiking was by far the most popular activity (89% of respondents hiked on trails), 28% or more of respondents listed each of five activities (hiking on trails, spending time alone, socializing, nature study and viewing wildlife) as a major reason for their visit. Visitors were also asked to rate how opposed or how supportive they were of certain potential management activities. The results show a general overall support of most listed potential management activities, with the glaring exception of the presence of pets both on and off leash, which was generally met with opposition (pg. 33). Visitor conflict was also found to exist, although not in large amounts, and mostly seemed to be a product of the behavior of others impacting one’s experience. Twelve percent (12%) of visitors reported behavior of others, especially those with dogs off-leash, interfered with their enjoyment of their visit. Twenty-five percent (25%) of visitors also reported a diminished experience due to perceived resource impacts from litter and dog excrement (pg. 41). These results led the authors to conclude that some visitors to HFR who bring dogs perceive HFR as they would a municipal dog park, which could create conflict with other visitors who have different perceptions of HFR. They also concluded that a swift resolution of conflict could happen if leashes were required and owners picked up their dog’s excrement (Martin and Widner 2000).
Other popular multiple-use recreation areas, like Golden Gate National Recreation Area of the National Park Service, have taken recent measures to mitigate conflicts between visitors with dogs and visitors without dogs. Overall, the National Park Service severely restricts all pets in most of its national parks due to significant opportunities for conflict between not only pets and other visitors but between pets and wildlife as well. In Yosemite National Park, for example, all trails, all non-developed areas, and all designated wilderness areas (i.e. park backcountry) are strictly off-limits to pets for a number of reasons listed by the park. These include potential harassment of wildlife; water pollution from feces; and harassment of pack stock and park visitors (National Park Service 2011).

A study conducted in Victoria, Australia illustrates the tenuous relationship between recreationists with dogs and those without dogs, as well as with sensitive wildlife and wildlife habitat (Williams et al. 2009). The purpose of the study was to assess the obligation felt by dog owners to leash their dogs on a stretch of beach, which, in addition to being a popular place for people to visit, houses populations of sensitive beach-nesting birds such as the Hooded Plover. The authors cite literature that demonstrates how unrestricted off-leash dog play negatively affects those bird populations. Generally, the results of the study found that dog owners valued highly both off-leash exercise for their dogs and also the protection of sensitive wildlife on the beach (Williams et al. 2009). Clearly, there is a paradoxical relationship between the two values that is not easily reconcilable. Additionally, many dog owners believed that while other dogs may pose a threat to wildlife and other visitors, their own dog posed far less of a
threat (Williams et al. 2009). Dog owners were asked to indicate their level of agreement on a sliding scale (1= strongly disagree and 7= strongly agree) with certain statements regarding dogs in general on beaches. But while most owners were in general agreement with 6 of the 7 statements (means between 4.68 and 5.53), there was a sharp decline for the statement “Own dog has negative consequences”, which garnered a mean of 3.02, indicating owners generally believed their dogs would not inflict any harm. These traits were also apparent throughout the 4,118 pages of comments the Golden Gate National Recreation Area received during the period of public scoping for their new dog management plan (National Park Service 2011), and this mindset makes it difficult for an outside entity to influence the behavior of dog owners, especially if most or all dog owners share that mindset. Due to this phenomenon, Williams et al. concluded that the best method to curb illegal and negative behavior in areas sensitive to dogs and make dog owners feel obligated to leash their animals is to influence the social norms of the area. By making it socially unacceptable to behave inappropriately, dog owners will drop their self-centered mindset and adopt one where they are concerned about fitting in socially (Williams et al. 2009).

The phenomenon described by Williams et al. is not unique to the beaches of Victoria, and Martin and Widner began to describe similar behavioral patterns of HFR visitors in 2000. With the increase in visitor numbers to HFR since 1999 and the accompanying increase in the number of people who bring dogs to HFR, this thesis aims to build upon existing literature exploring the nature of recreation conflict between visitors who bring dogs to a public recreation area and people who don’t bring dogs, and
provide current data to the BLM to be integrated into future management plans for the reserve.
STUDY AREA

Headwaters Forest Reserve is a crown jewel among the lands administered and managed by the BLM in northern California. Located approximately six miles southeast of the city of Eureka, the area comprises 7,472 total acres. 3,088 acres are virgin redwood forest and the remaining 4,384 acres are previously harvested, second-growth redwood forest and brushlands. The reserve also contains a portion of the Elk River and Salmon Creek watersheds, providing habitat for threatened anadromous fish species, including coho and chinook salmon and steelhead trout.

While managed primarily as an ecological reserve, the BLM has created several opportunities for recreation within the reserve. Visitor use has been increasing since the area opened to the public in 1999, and the area received an estimated 6,875 visitors during the sampling period of 2012, an increase of 81% from 1999, when HFR received approximately 3,874 visitors during the same time period (Martin and White 2013). Two trails provide access to the reserve for recreationists—the Salmon Pass Trail in the southern portion of the reserve, and the Elk River Trail in the northern portion. The Salmon Pass Trail is 2.7 miles roundtrip, and can be accessed by the public only via guided ranger hikes led by BLM rangers. The Elk River Trail is 10.5 miles roundtrip, and is the primary access point for visitors to the reserve. The trail begins at the end of the Elk River Road, and, while it is one continuous trail, it is “split up” into several segments along its extent, with each segment managed to provide a particular type of recreation.
opportunity. The first three miles of the trail follow the Elk River, and wind through second-growth redwood forest. They are open to all types of recreation allowed by the BLM in the reserve. This includes walking, hiking, bicycling, and dog walking.

The first mile is paved, and contains interpretive signs designed to educate visitors about the natural and cultural history of the reserve. The Headwaters Education Center is also located along this section of the trail, approximately three quarters of a mile from the trailhead. The trail is unpaved beyond the first mile, and at the end of three miles, the trail crosses a bridge over the Elk River. Beyond this bridge, the remaining 2.25 miles of trail leave the river and climb a steep ridge in uncut forest, eventually finishing in a short loop of an old-growth redwood grove. This section of the trail is restricted to hikers only.
METHODS

The survey method was selected as the primary research tool for this project for a number of reasons. A survey is an excellent tool for collecting primary source data from a representative sample and extrapolating that data to the population as a whole (Nishikawa 2003, p. 51). All data collected are original and unique, thus rendering them highly valuable additions to pre-existing secondary source data, which may not be sufficient for such a project. Surveys can also acquire types of data and information that secondary sources cannot provide, such as psychological information and behavioral information, which are typically specific to an individual subject or group and can be thoroughly gleaned through survey methods (Nishikawa 2003, p. 54-55). Conducting a new survey rather than employing a different research tool also maintains consistency with, and allows for easy comparison to, the data collected in 1999. Specific to this study itself, there is a dearth of secondary sources of the visitor use information this study seeks to analyze. The BLM does not have records of conflict data, as the only research into the subject they had conducted previously was the survey conducted in 1999, when the area first opened to the public. A survey is the best method for acquiring the necessary data on visitor conflict for this project.
Sampling Procedures

This survey was conducted from May 26 to September 16, 2012, coinciding with the summer recreation season. It was designed to be a follow-up to the first visitor survey conducted in 1999, when Headwaters Forest Reserve was first opened to public use. The data were collected in two phases: The first was a brief on-site interview, and the second was a written questionnaire that was mailed to participants one to two weeks following the on-site interview. An identical online version of the survey was also available for participants to complete instead of the mailed version, if they preferred. All participants in the survey were users of the Elk River Trail, by far the more heavily used trail in Headwaters Forest Reserve. On-site data were collected from May 26 to September 16 of 2012 using a stratified random sampling plan. On-site interviews were conducted over a period of 50 unique days, split evenly between weekdays and weekend days/holidays. Daily sampling periods were split between “morning”, “afternoon”, and “evening”. “Mornings” were defined as the period of time between 8:00 am and 12:00 pm, “afternoons” between 12:00 pm and 4:00 pm, and “evenings” after 4:00 pm. Sample days were always 8 hours, ranging either from 8:00 am to 4:00 pm or 12:00 pm to 8:00 pm depending on random selection. Therefore due to overlap, afternoons were always sampled, and were sampled roughly twice as often as mornings and evenings. Interviewees were selected at the Elk River Trailhead, with 52 groups declining to participate. No one particular visitor group was focused on, and the author attempted to contact every group he encountered at the trailhead. A website address unique to each
participant was printed on the survey linking to the online version. The project received both OMB (#1004-0202) and IRB (#11-227) approval.

**Survey Instrument**

The first component of the data collection was the on-site interview (Appendix A). Each interview lasted approximately 5-10 minutes. Subjects agreed to participate further by providing their home mailing address in order to receive the follow-up written survey. Information was collected from no more than two people per group, and this was done only for instances when group members lived in different households. Most groups in this survey were represented by only one group member.

The second component of the data collection was the written survey (Appendix B), which was mailed to participants one to two weeks later following the on-site interview. The survey was 26 questions in length, and estimated to take approximately 30 minutes to complete. In addition to collecting demographic information, the survey asked the participant to assess the quality of their visit, as well as the quality of area management by the BLM, as perceived by the participant. This included management of natural resources, ease of access to Headwaters Forest Reserve, and management of various user groups and their interactions. Additionally, the BLM was specifically interested in how the presence of dogs and the current dog policy affects the quality of the visitor experience in the Headwaters Forest Reserve; therefore a section of the survey
was dedicated to questions regarding that issue. The survey questions include multiple choice questions, “yes” or “no” questions, open-ended answer questions, and questions that are answered on a Likert-type scale, which primarily address visitors’ assessment of BLM management practices. When completed the survey was mailed back by respondents to the researchers in the provided self-addressed, postage-paid envelope. If participants had not returned a completed survey within a week of the first mailing, a reminder postcard was mailed, and if participants had not returned a completed survey within two weeks after the postcard was mailed, a second replacement survey was mailed.
RESULTS

Characteristics of the Sample

A total of 631 individuals were contacted at the Elk River Trailhead, with 609 of those 631 agreeing to be mailed the follow-up survey after the on-site interview. Of those 609 who were mailed a survey, 434 completed and returned the survey either on paper or online, resulting in a 71.3% return rate. Ages of respondents ranged from 18-84 years, with a mean age of 47 years and a median age of 48 years. Fifty-five percent (55%) of respondents were female, and 45% were male. A large percentage of respondents (87.6%) identified themselves ethnically as White/Anglo-American, and 83.9% of all respondents indicated achieving a level of education higher than high school (i.e. college or graduate degree). These results follow typical national recreation trends, and are very comparatively similar to demographic data from the 1999 survey. Almost all participants were from the state of California, and amongst those a vast majority (337 of the 434 participants) came from Humboldt County.

During the data collection season from May 26 to September 16, 2012, an estimated total of 6,875 people visited Headwaters. This figure was extrapolated from tallies taken during sample days. Average visitor use on weekdays was 52 to 53 people, and increased to 76 to 77 people on weekends and holidays.

Most visitors to HFR came in groups of two or more, with a mean group size between 2 and 3. Only 21% of visitors came by themselves. About 53% of all groups
classified themselves as “family only”, by far the most common group type. Overall, 57.8% of respondents indicated that their group consisted at least partially of family, indicating the popularity of HFR as a place for families to visit.

Seventy-five percent (75%; 455 groups) of all groups reported visiting HFR previously, with estimates of the number of previous visits varying from one to more than 100, an increase of 44% from 1999, when 31% (91 groups) reported visiting HFR previously. It is important to note that the significant increase in visitors who had previously visited compared to the 1999 survey can be attributed to the fact that many years have elapsed since HFR opened to the public, increasing the area’s visibility to the public and creating a larger time window for previous visits (the 1999 survey was done the first year the Headwaters Forest Reserve was open to the public). Respondents to the written mail-back survey were asked how frequently they visited HFR, with 25.1% answering “once every few months”, and 24.7% answering “1 to 3 times per month”.

Once visitors arrived at HFR, they participated in a wide variety of activities. By far the most popular activity was hiking on the Elk River Trail, with over 95% of respondents saying they had participated in that activity. Dog walking was the next most popular activity, with 45.1% of respondents saying it was a major reason for their trip to HFR. Wildlife viewing and socializing were the next two most popular activities. The popularity of these four activities illustrates the wide variety of activities in which visitors to HFR tend to participate (Table 1).

Visitors were asked how long their visit to HFR was and consequently how far they traveled along the Elk River Trail. A majority of respondents (69.7%) did not stay at
HFR for more than two hours, and 46.9% of respondents did not travel beyond the end of the paved section of trail (one mile). An additional 25.6% did not go beyond the first bridge, which marks two miles, and only 4.9% made it all the way to the old-growth forest loop at the end of the trail. These results illustrate that many people use the reserve for short hikes or walks, rather than long-distance, strenuous day hikes.

Conflict Results

With such a wide variety of user types condensed into one section of narrow trail, conflict is bound to occur. Many questions in the survey addressed the issues of conflict within the reserve. Visitors were asked questions about crowding, behavior interference by others, and general resource impacts, all potential problems that could negatively impact the visitor experience. To address issues of crowding, visitors were asked to list how many other people they saw during their visit, and how many other groups they saw during their visit that had a dog, and then were asked their feelings about the number of people and dogs they saw. Tables 2 to 6 summarize these data and indicate that visitors overall were not too bothered by the number of visitors and the number of dogs they saw during their visit, although they were three times as likely to be bothered by the number of dogs they saw (i.e. to say they saw too many) than by the number of other people they saw (Table 4). Visitors who don’t bring dogs to the area were seven times more likely to indicate that they saw too many dogs than were visitors who bring dogs to the area (Table 5), suggesting a clear demarcation in the visitor population.
Table 1. Participation rates of activities at HFR that were indicated as a major reason for visit, by respondents who have and who have not brought dogs.

<table>
<thead>
<tr>
<th>Activity</th>
<th>% major reason for trip and (total participation rate) for respondents who have brought dogs (n=230)</th>
<th>% major reason for trip and (total participation rate) for respondents who have not brought dogs (n=203)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking on trail</td>
<td>85.4 (95.1)</td>
<td>84.5 (95.3)</td>
</tr>
<tr>
<td>Spending time alone</td>
<td>23.2 (45.4)</td>
<td>17.1 (36.0)</td>
</tr>
<tr>
<td>Socializing</td>
<td>27.4 (66.7)</td>
<td>35.2 (78.2)</td>
</tr>
<tr>
<td>Nature study</td>
<td>15.7 (64.6)</td>
<td>30.6 (72.3)</td>
</tr>
<tr>
<td>Historical/cultural study</td>
<td>10.9 (51.6)</td>
<td>20.0 (62.4)</td>
</tr>
<tr>
<td>Wildlife viewing</td>
<td>32.1 (83.2)</td>
<td>35.1 (83.6)</td>
</tr>
<tr>
<td>Photography</td>
<td>10.1 (33.3)</td>
<td>18.0 (40.4)</td>
</tr>
<tr>
<td>Dog walking</td>
<td>75.8 (84.9)</td>
<td>1.9 (2.6)</td>
</tr>
</tbody>
</table>

1 Logically, this cell should be 0.0.
Table 2. Number of other visitors seen; n=421.

<table>
<thead>
<tr>
<th>Number of other visitors seen</th>
<th>Percent of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5</td>
<td>19.3%</td>
</tr>
<tr>
<td>6 to 10</td>
<td>38.5%</td>
</tr>
<tr>
<td>11 to 20</td>
<td>35.7%</td>
</tr>
<tr>
<td>More than 20</td>
<td>6.7%</td>
</tr>
</tbody>
</table>

Mean # of other visitors seen = 11.5. Median # of other visitors seen = 10.

Table 3. Number of other groups with dogs seen; n=418.

<table>
<thead>
<tr>
<th>Number of other groups with dogs seen</th>
<th>Percent of sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 3</td>
<td>57.6%</td>
</tr>
<tr>
<td>4 to 6</td>
<td>31.4%</td>
</tr>
<tr>
<td>7 to 10</td>
<td>9.3%</td>
</tr>
<tr>
<td>More than 10</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

Mean # of groups w/ dogs seen = 3.8. Median # of groups w/ dogs seen = 3.
Table 4. Visitor feelings about number of other visitors and dogs.¹

<table>
<thead>
<tr>
<th>Visitor evaluation of number of other hikers and dogs seen</th>
<th>Percent indicated for number of visitors seen (n=379)</th>
<th>Percent indicated for number of dogs seen (n=365)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw too many</td>
<td>2.6%</td>
<td>8.2%</td>
</tr>
<tr>
<td>Saw about the right number</td>
<td>49.6%</td>
<td>38.4%</td>
</tr>
<tr>
<td>Saw too few</td>
<td>4.0%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Does not matter to me</td>
<td>43.8%</td>
<td>50.1%</td>
</tr>
</tbody>
</table>

¹χ² = 170.94, df = 9, p < 0.000.

Table 5. Comparison of visitor feelings of number of dogs seen, by respondents who have or have not brought dogs to HFR.¹

<table>
<thead>
<tr>
<th>Visitor evaluation of # of dogs seen</th>
<th>Percent for those who have brought dogs to this area (n=230)</th>
<th>Percent for those who have not brought dogs to this area (n=203)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw too many</td>
<td>2.0%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Saw about the right number</td>
<td>40.8%</td>
<td>35.7%</td>
</tr>
<tr>
<td>Saw too few</td>
<td>4.1%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Does not matter to me</td>
<td>53.1%</td>
<td>47.0%</td>
</tr>
</tbody>
</table>

¹χ² = 20.78, df = 3, p < 0.000.
**Table 6.** Comparison of visitor feelings of number of dogs seen, by first time visitors versus repeat visitors.¹

<table>
<thead>
<tr>
<th>Comparison of visitor evaluation of # of dogs seen, by first-time visitors versus repeat visitors.</th>
<th>Percent for first-time visitors (n=90)</th>
<th>Percent for repeat visitors (n=271)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw too many</td>
<td>13.3%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Saw about the right number</td>
<td>41.1%</td>
<td>37.3%</td>
</tr>
<tr>
<td>Saw too few</td>
<td>1.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Does not matter to me</td>
<td>44.4%</td>
<td>52.0%</td>
</tr>
</tbody>
</table>

¹χ² = 20.96, df = 12, p = 0.051
Respondents were asked if they noticed any impacts to resources at HFR that they believed were caused by other visitors, with 72.0% answering no and 28.0% answering yes. The most common impacts visitors noticed were litter and dog waste bags left on the trail, and numerous side trails that damaged plants.

Only a small percentage of visitors (8.3%) reported having their experience negatively affected (i.e. goal interference) by the behavior of other visitors. A total of 46 comments were made regarding negative experiences, and 21 of these (46%) mentioned unleashed and uncontrolled dogs. Others mentioned bicyclists riding too fast and recklessly, and secondhand smoke from cigarette smokers.

As a significant component of the investigation into conflict at HFR, study participants were asked several detailed questions about their opinion of dogs at HFR and about the BLM’s current policy on dogs at HFR, which allows dogs to be off leash but requires them to be under voice control at all times. The responses of those who had previously brought dogs to HFR (n=230) were also contrasted with the responses of those who had not previously brought dogs to HFR (n=203). Tables 7 and 8 summarize these data. These results provide insight into the attitudes of the two demographic groups, with visitors who have brought dogs clearly believing the policy works, and perhaps overemphasizing its effectiveness to try to persuade the BLM not to make any restrictive changes.

Similar response patterns exist within almost all of the questions regarding the dog policy, especially those questions that were analyzed by contrasting the responses of visitors who had brought dogs previously and those who had not. These trends were
Table 7. Overall visitor knowledge of and sentiment toward current HFR dog policy; n=434.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know/Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you know what the current dog policy was for HFR before taking this survey?</td>
<td>49.0%</td>
<td>46.4%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Do you believe the rule requiring dogs be kept under voice control is working?</td>
<td>57.0%</td>
<td>14.0%</td>
<td>29.1%</td>
</tr>
<tr>
<td>Do you believe the rules and regulations concerning dogs are adequately displayed?</td>
<td>54.4%</td>
<td>18.3%</td>
<td>27.3%</td>
</tr>
<tr>
<td>Do you believe the rules and regulations concerning dogs are adequately enforced by BLM law enforcement in the area?</td>
<td>24.5%</td>
<td>11.1%</td>
<td>64.4%</td>
</tr>
<tr>
<td>Do you believe the BLM should implement a more restrictive dog policy?</td>
<td>19.2%</td>
<td>80.8%</td>
<td>-----</td>
</tr>
</tbody>
</table>

Table 8. Overall visitor sentiment toward dog walking in HFR; n=434.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know/Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever brought a dog to the area?</td>
<td>53.1%</td>
<td>46.9%</td>
<td>-----</td>
</tr>
<tr>
<td>Has the primary reason for any of your previous visits to HFR been for dog walking?</td>
<td>41.1%</td>
<td>58.9%</td>
<td>-----</td>
</tr>
<tr>
<td>If you visit with dogs, do you ever visit HFR specifically because no leash is required for your dog(s)?¹</td>
<td>48.5%</td>
<td>49.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>On any of your visits to HFR, have you ever been bothered by dogs?</td>
<td>16.1%</td>
<td>83.9%</td>
<td>-----</td>
</tr>
<tr>
<td>On any of your visits to HFR, have you witnessed a dog impacting the natural environment?</td>
<td>16.4%</td>
<td>83.6%</td>
<td>-----</td>
</tr>
</tbody>
</table>

¹Question answered only by respondents who said “yes” to the question “Have you ever brought a dog to the area?” n=230.
**Table 9.** Comparisons of visitor sentiment toward HFR dog policy and dogs in HFR, by respondents who have and have not brought dogs to HFR\(^1\). Brought dogs: n=230. No dogs: n=203.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know/Not Sure</th>
<th>(\chi^2) (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did you know what the current dog policy was for HFR before taking this survey?</td>
<td>68.7% / 27.0%</td>
<td>26.6% / 68.5%</td>
<td>4.7% / 4.5%</td>
<td>79.14 (.000)</td>
</tr>
<tr>
<td>Do you believe the rule requiring dogs be kept under voice control is working?</td>
<td>75.4% / 36.3%</td>
<td>7.9% / 20.4%</td>
<td>16.7% / 43.3%</td>
<td>66.74 (.000)</td>
</tr>
<tr>
<td>Do you believe the BLM should implement a more restrictive dog policy?</td>
<td>8.1% / 35.8%</td>
<td>91.9% / 64.2%</td>
<td>------</td>
<td>41.50 (.000)</td>
</tr>
<tr>
<td>On any of your visits to HFR, have you ever been bothered by dogs?</td>
<td>11.0% / 22.0%</td>
<td>89.0% / 78.0%</td>
<td>------</td>
<td>9.38 (.000)</td>
</tr>
</tbody>
</table>

\(^1\) Percentages for those who brought dogs are listed first, followed by percentages for those who did not bring dogs.
crowned by responses to the final “yes/no” question, which asked if respondents believed the BLM should implement a more restrictive dog policy (Table 9). Of the visitors who had previously brought dogs with them, only 8.1% said “yes”, while 91.9% said “no”; of the visitors who hadn’t previously brought dogs, 35.8% said “yes” and 64.2% said “no”. This shows that for every one visitor who had brought dogs who answered “yes”, roughly three visitors who hadn’t brought dogs said “yes” as well, a significant difference ($\chi^2 = 41.500, \text{df} = 1$, significant at $p < 0.001$).

Respondents were given the opportunity to make opened-ended comments explaining their answers to those questions. In response to the question “On any of your visits to HFR, have you ever been bothered by dogs?” 84 comments were made (representing 20% of all respondents), and 59 of the 84 comments (70%, representing 14% of all survey respondents) mentioned unleashed/out-of-control dogs. In response to the question “On any of your visits to HFR, have you witnessed a dog impacting the natural environment?” 75 comments were made, and 26 of the 75 (35%) mentioned dog waste specifically. Another 24 comments (32%) specifically mentioned dogs in the Elk River. Finally, in response to the question “Should the BLM implement a more restrictive dog policy?” 56 comments (representing 13% of all respondents) suggested that dogs should be leashed, and ten other comments suggested increased enforcement of the voice control policy. These numbers correspond to the percentage of “yes” responses for these questions. Appendices C, D, and E list selected comments for each of these three questions.
Visitors were asked to indicate their support for or opposition to potential dog management techniques. These included requiring dogs to be on leashes at all times, prohibiting dogs from HFR all together, allowing dogs on weekdays only, and maintaining the existing voice control policy. Responses to these questions were again analyzed by contrasting those who had brought dogs and those who had not. Very few visitors overall supported either prohibiting dogs all together or allowing them only on weekdays, but there were marked differences in responses to requiring dogs to be on leashes and maintaining the existing policy. Overall, 43.9% of visitors either strongly or somewhat supported requiring dogs to be on leashes, and 39.0% either strongly or somewhat opposed. For visitors who had previously brought dogs, only 27.7% supported the idea, and 57.0% opposed it. In contrast, 62.4% of visitors who hadn’t previously brought dogs supported the idea, with only 18.3% opposing it. Tables 10 through 12 summarize the rest of the results.

Finally, visitors were asked if any changes in their visitation patterns and attitudes would occur should the BLM choose to implement a more restrictive dog policy. Visitors were asked whether they would be more likely to visit after implementation of a more restrictive policy, less likely to visit, or whether there would be no change. Tables 13 and 14 summarize these data. Generally, visitors who hadn’t previously brought dogs to HFR indicated they would be more likely to return to the area, but a majority said their visitation patterns wouldn’t change. Conversely, those who had previously brought dogs indicated they would be far less likely to return to the area, and appeared to have more of a stronger opinion on the issue than those who hadn’t brought dogs.
The responses for this final question regarding dogs at HFR are a good summary of the feelings of HFR visitors toward dogs at the reserve. In general, more visitors would prefer that the BLM refrain from implementing a more restrictive policy, but not by a significant margin. Over two-thirds of visitors who had previously brought dogs said they were less likely to visit HFR with a new policy in place, and three-quarters of visitors who hadn’t previously brought dogs said they wouldn’t change their visitation patterns to HFR, revealing a sense of indifference toward the implementation of a new policy, as well as a lack of beneficence of a new, more restrictive policy. To compound the complexity of the issue, only 14.4% of all visitors said that pets off leash were a major or moderate problem on their visit to HFR, while 72.1% said they were not a problem.
Table 10. Overall visitor sentiment toward possible changes in dog policy; n=434.

<table>
<thead>
<tr>
<th>Change in Policy</th>
<th>Strongly support</th>
<th>Somewhat support</th>
<th>Neutral</th>
<th>Somewhat oppose</th>
<th>Strongly oppose</th>
<th>Mean rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Require all dogs to be on leash</td>
<td>27.0%</td>
<td>16.9%</td>
<td>17.1%</td>
<td>16.7%</td>
<td>22.3%</td>
<td>2.90</td>
</tr>
<tr>
<td>Prohibit dogs from HFR</td>
<td>1.9%</td>
<td>4.2%</td>
<td>9.4%</td>
<td>11.1%</td>
<td>73.3%</td>
<td>4.50</td>
</tr>
<tr>
<td>Allow dogs only on weekdays</td>
<td>1.4%</td>
<td>5.5%</td>
<td>16.6%</td>
<td>13.0%</td>
<td>63.5%</td>
<td>4.32</td>
</tr>
<tr>
<td>Maintain existing voice control policy</td>
<td>45.0%</td>
<td>16.6%</td>
<td>18.3%</td>
<td>10.5%</td>
<td>9.6%</td>
<td>2.23</td>
</tr>
</tbody>
</table>

For mean ratings, 1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose.

Table 11. Visitor sentiment toward possible changes in dog policy, for people who have brought dogs; n=230.

<table>
<thead>
<tr>
<th>Change in Policy</th>
<th>Strongly support</th>
<th>Somewhat support</th>
<th>Neutral</th>
<th>Somewhat oppose</th>
<th>Strongly oppose</th>
<th>Mean rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Require all dogs to be on leash</td>
<td>13.2%</td>
<td>14.5%</td>
<td>15.4%</td>
<td>19.7%</td>
<td>37.3%</td>
<td>3.53</td>
</tr>
<tr>
<td>Prohibit dogs from HFR</td>
<td>0.0%</td>
<td>0.0%</td>
<td>1.8%</td>
<td>3.5%</td>
<td>94.7%</td>
<td>4.93</td>
</tr>
<tr>
<td>Allow dogs only on weekdays</td>
<td>0.0%</td>
<td>4.0%</td>
<td>5.8%</td>
<td>9.3%</td>
<td>81.0%</td>
<td>4.67</td>
</tr>
<tr>
<td>Maintain existing voice control policy</td>
<td>63.3%</td>
<td>15.3%</td>
<td>11.4%</td>
<td>4.8%</td>
<td>5.2%</td>
<td>1.73</td>
</tr>
</tbody>
</table>

For mean ratings, 1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose.
Table 12. Visitor sentiment toward possible changes in dog policy, for people who have not brought dogs; n=203.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Strongly support</th>
<th>Somewhat support</th>
<th>Neutral</th>
<th>Somewhat oppose</th>
<th>Strongly oppose</th>
<th>Mean rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Require all dogs to be on leash</td>
<td>42.6%</td>
<td>19.8%</td>
<td>19.3%</td>
<td>13.2%</td>
<td>5.1%</td>
<td>2.18</td>
</tr>
<tr>
<td>Prohibit dogs from HFR</td>
<td>4.1%</td>
<td>9.2%</td>
<td>18.4%</td>
<td>19.9%</td>
<td>48.5%</td>
<td>3.99</td>
</tr>
<tr>
<td>Allow dogs only on weekdays</td>
<td>3.1%</td>
<td>7.2%</td>
<td>29.2%</td>
<td>17.4%</td>
<td>43.1%</td>
<td>3.90</td>
</tr>
<tr>
<td>Maintain existing voice control policy</td>
<td>23.9%</td>
<td>18.3%</td>
<td>26.4%</td>
<td>17.3%</td>
<td>14.2%</td>
<td>2.80</td>
</tr>
</tbody>
</table>

For mean ratings, 1=strongly support, 2=support, 3=neutral, 4=oppose, 5=strongly oppose.
Table 13. Respondents’ intentions to return for a future visit with a more restrictive dog policy in place; comparison of those who do and those who do not bring dogs.

<table>
<thead>
<tr>
<th>% of people who do bring dogs to the area (n=230)</th>
<th>% of people who don’t bring dogs to the area (n=203)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More likely</td>
<td>5.7</td>
</tr>
<tr>
<td>Less likely</td>
<td>64.0</td>
</tr>
<tr>
<td>No change</td>
<td>30.3</td>
</tr>
</tbody>
</table>

Table 14. Respondents’ intentions to return for a future visit with a more restrictive dog policy in place; comparison of first-time and repeat visitors.

<table>
<thead>
<tr>
<th>% of First-time visitors (n=115)</th>
<th>% of Repeat visitors (n=308)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More likely</td>
<td>15.7</td>
</tr>
<tr>
<td>Less likely</td>
<td>16.5</td>
</tr>
<tr>
<td>No change</td>
<td>67.8</td>
</tr>
</tbody>
</table>


DISCUSSION

Voice control policies are popular management decisions enacted to allow off-leash recreation for dogs and dog owners. Often, such policies are initially lauded by the public, who tend to value management decisions that are non-restrictive and provide health benefits for themselves and for their pets (GGNRA 2011). In Humboldt County, the Headwaters Forest Reserve is one of the few places on federal public land in the region where visitors can take their dogs off-leash, and the combination of easy accessibility to a relatively pristine ecological reserve with the opportunity for recreation and exercise with pets off-leash creates immense public value---true not only at HFR, but at other recreational areas as well. However, notable parks that allow for dogs off-leash have found that their current voice control policy is insufficient to prevent visitor conflict and interference with enjoyment of visits by visitors. At HFR, 11% of visitors who had previously brought dogs and 22% of visitors who hadn’t previously brought dogs experienced some level of conflict with dogs, and almost 20% of all visitors believe there ought to be a more restrictive dog policy. Instances of such conflict at HFR aren’t especially high compared to places like the GGNRA, but they do follow national trends. It is evident that simple voice control policies like the one employed at HFR and elsewhere don’t work as well as park managers initially believed they would, and additional measures are needed to achieve original management goals.

The failures of off-leash/voice-control policies in public recreation areas seem to lie primarily within the nexus of responsibility, on the part of both management agencies and
visitors. Many agencies, including the National Park Service, United States Forest Service, and sub-national-level agencies have adopted voice-control policies in public lands under their jurisdiction. The most visible recent policy change can be found in the Golden Gate National Recreation Area (GGNRA), a National Park Service area that encompasses parts of Marin, San Francisco, and San Mateo counties. The area was created in 1972, reclaiming lands previously used mostly by the United States Army.

According to the National Park Service, the GGNRA is the largest national park unit in an urban setting, and receives more than 20 million visitors each year. The area is a popular place for people to walk their dogs, and visitors had been walking their dogs off-leash in the area before it became a unit of the National Park Service. While the National Park Service typically has strict restrictions on dogs within park boundaries, GGNRA management allowed continued off-leash dog walking in the park. This practice led to issues of conflict, forcing management to create an explicit dog policy for the area in 1979, which included allowances for walking dogs off-leash. Since that time, both visitor use and dog walking in the area has increased drastically, which has led to increases in visitor conflict. In 2001, the existing voice-control policy was voided by the National Park Service as it was in violation of existing Park Service regulations, forcing the GGNRA to amend their policy. During the decade since, the park has slowly developed its new policy, culminating in the 2011 Draft Dog Management Plan/EIS and 2013 Supplement EIS. The situation in GGNRA provides an excellent case study in dog management and visitor conflict resolution in public recreation areas.

The city of Boulder, Colorado developed its own dog management policy to cover
its Open Space and Mountain Parks (OSMP) program, one that is quite different from that which was developed by the GGNRA. The city launched the Voice and Sight Tag program in 2006, which is designed to “increase compliance with existing voice and sight [control] rules and decrease dog-related conflict on OSMP-managed lands”---in other words, the city aspires to preserve off-leash dog recreation, something it deems highly valuable to its residents, while at the same time attempting to reduce conflict. The main component of the program is requiring users of OSMP lands to register their dogs in the program after watching an educational video, essentially indicating the owner’s awareness and knowledge of the regulations, and both the owner’s and the dog’s ability to adequately follow them. Registered dogs wear city-issued green dog tags on their collar, with 25,000 people registering their dogs in 2010. Of registered dogs who were observed off-leash in 2010, 86% were wearing the tags. Initially, rates of observed conflict decreased over the first few years, but these rates increased to pre-program levels by 2010.

Other voice control/off-leash restrictions are used in the Rattlesnake National Recreation Area in the Lolo National Forest, just north of Missoula, Montana, where dogs are not allowed off-leash for the first 1.7 miles of trail in the Rattlesnake drainage and the first 1.3 miles of trail in the Spring Gulch drainage. Additionally, dogs are banned altogether from the Rattlesnake drainage from December 1 through the end of February, from the Spring Gulch drainage between December 1 and May 15, and from the Sawmill and Curry gulches year-round. These restrictions are in place to protect wildlife and water and reduce conflict between visitors (Lolo National Forest 2013). Restrictions along
beaches in Victoria, Australia and in William B. Umstead State Park in North Carolina are highlighted in scientific studies cited in this section.

What makes management for dogs so challenging in public areas such as these is the jarring juxtaposition between management objectives. While “recreation” areas, these places are managed for resource protection and environmental values as well. Headwaters Forest Reserve is the most prime example of this imbalance, being managed primarily for resource protection, with recreation being a secondary management objective. In fact, as mentioned previously, visitors have very little access to the reserve, being able to travel on only two trails, the longest of which is only 5 miles, and the other having restricted access. This funnels visitor use onto the Elk River Trail, creating a clog that cultivates conflict between visitors. As total visitor figures increase annually, such conditions for conflict are exacerbated. Additionally, visitors to HFR participate in a wide variety of activities and visit HFR for different reasons. This variety can also contribute to the cultivation of conflict, as visitors do not want to be interfered with during their activities. Relieving such conflict requires resources and increased management attention, such as increased on-site management presence and/or enforcement activity, which might have to come at the expense of other management programs.

A lack of external pressure and enforcement by the managing agencies has sometimes contributed to management problems and an inability to achieve all desired management goals. For example, the city of Boulder implemented its tag program to reduce conflict between visitors and dogs on its popular parklands, and foster education and awareness of park regulations. While rates of conflict initially decreased over the first
few years, they returned to pre-program levels in 2010. After investigating the reversal in
trend, the city eventually cited a variety of factors inhibiting reductions in conflict,
including the limited skill of dog owners to control their pets, little to no external pressure
to comply with rules, and personal attitudes and beliefs overriding external influences.
The city was right back to square one, and was unsure how to continue from there.

While managing agencies have attempted to exert authority over issues of dog
conflict by creating numerous signs and brochures and using stern language to discourage
users from breaking rules, Williams et al. (2009) have demonstrated the ineffectiveness
of this strategy, as the public does not respond positively to such heavy-handed
approaches from authoritative agencies. Coupling these findings with a general lack of
management resources shifts the burden of responsibility from the managing agency to
the members of the public. The biggest obstacle in shifting the burden of responsibility to
the public is fostering individual compliant attitudes amongst visitors. A common
problem for public land managers is that more often than not their ideas and goals for
management disagree significantly with visitors’ ideas and goals. At HFR, 50.7% of all
survey respondents participated in dog walking. Additionally, 14% of all visitors made
comments on experiential disturbances due to dogs and dog waste, while 17%
commented on resource damage by dogs that they noticed (Martin and White 2013).
These are not insignificant figures, yet the BLM has never really seemed to consider dog
recreation a management priority at HFR, with a dog policy that has been unmodified
since its implementation. During the period for public commenting on its new dog
management proposal, the GGNRA received many comments from dog owners
illustrating a self-centered, emotional attitude (i.e. “my dog is always great, I’ve never had problems”) without taking into consideration the inherently socially interactive nature of public recreation areas. This attitude was also prevalent in statistical work done by Williams et al. (2009) and Vaske et al. (2007), as well as in the comments mentioned previously for the HFR survey, including “I bring the dog to HFR a couple times a week. I hike by myself. Depending on the amount of time I have depends on how far we go. I do take him on the old growth loop and wish dogs were allowed in this area. Since I hike by myself I'm prepared to pay the fine, however it would be nice to not have to worry about this.” In these and other instances, disconnections existed between the visitor’s own recreational agenda and the agendas of both other visitors and of the management agency. Bridging these disconnections becomes critical in remedying user conflict, and there are several indirect management methods that can be employed to achieve that.

Previous research by Williams et al. (2009) and Gramman et al. (1987), among others, indicates a need to alter the behavior of dog walkers. This requires changing the beliefs of visitors to conform to the BLM’s management goals for Headwaters. Nesbitt (2006) suggests that the primary goals of visitors to recreation areas are self-motivated, and the behavior of visitors will not change if “…the personal benefit of achieved outcomes seems greater than the cost shared by everyone” (pg. 39). Williams et al. (2009) concluded that cognitive dissonance amongst beach users with dogs creates self-sustaining attitudes that contradict ideal management goals for plovers on public beaches in Victoria, Australia: “Cognitive dissonance theory (Festinger, 1957) suggests people may create plausible but untrue rationalizations for information that conflicts with a
deeply held belief. This is illustrated by comments made to the interviewer by several
dog owners, who asserted that their dog was different and ‘wouldn’t hurt a fly’”.
Examples of this attitude are found in comments for the HFR survey, with one
respondent saying “Some folks don't leash their dogs when others approach like I do. My
dog is friendly so it isn't a problem. Really, most folks seem responsible about theirs.”
Other comments included “A dog was not responding to its owners voice command. He
kept nipping and barking at my dogs. Owner got mad at me when I shooed her dog away.
The dog actually scared and bullied my dog so much she ran back to the car” and “I
would work to [keep] the policy what it is now. I've spent hundreds of hours on this trail
with my dog and haven't experienced anything untoward except very occasionally
someone doesn't pick up dog poop.” Because these attitudes are so deeply held, it is
difficult to change them.

Williams et al. (2009) suggest the most effective method for overall change is to
change social norms to better fit management goals, a notion agreed upon by the city of
Boulder. Nesbitt (2006) suggests a similar tactic, writing “The key to changing
subjective norms lies in changing the individual’s perception of what others want.
Changes in subjective norm must involve changes in normative beliefs or the motivation
to comply with an important referent group” (pg. 39). Drawing heavily from Gramman
and Vander Stoep (1987), he continues: “Managers desiring to reduce actions of
noncompliance by responsibility denial violators should, optimally, structure policy so
that a clear choice exists between a moral and an amoral action...Uninformed violators
should be made aware of the negative consequences of their actions to activate feelings of
personal responsibility.” In essence, changing visitor beliefs through manipulation of social norms requires visitors shedding their deeply held, self-centered and emotionally influenced beliefs in deference to a shared, unified attitude promoting behavior harmonious with the interests of both other visitors and of the management agency.

Gramman and Vander Stoep (1987) developed a system to combat resource damage and park violations by categorizing the types of resource/park violations based on underlying sociological and psychological principles and suggesting unique approaches to combating each type. The authors identify the need to use indirect methods of management that alter people’s interpretation of prevailing social norms, which influence moral and ethical behavior, in order to reduce normative violations in protected areas. Six types of violations are identified: “uninformed” violations, “responsibility-denial” violations, “unintentional” violations, “status-confirming” violations, “willful” violations, and “releasor-cue” violations. Identifying and addressing each violation type individually or collectively in a broad-scope management plan is key to reducing resource damage and park violations.

My suggestions for future management of Headwaters Forest Reserve to alleviate future visitor/dog conflict follow the conclusions reached by Gramman and Vander Stoep (1987), Williams et al. (2009) and Nesbitt (2006), and attempt to address each type of violation from Gramman and Vander Stoep’s 1987 classification that occurs at HFR. Identifying and addressing specific violation/violator types creates a tangible foundation for management while streamlining the management planning process and making it more precise. In HFR, violations involving visitor conflict with dogs (i.e. unleashed dogs
not under voice control, dog waste left behind) fall primarily within the “unintentional” category (i.e. dog owners unaware of park policy before arriving at HFR); the “uninformed” category (i.e. dog owners are unaware of the consequences of negative actions like leaving dog waste behind); the “releasor-cue” category (i.e. dog owners allowing their dogs to run unleashed because they observe others doing the same); and the “responsibility-denial” category (i.e. dog owners recognize that leashing dogs around children is the right thing to do, but are unwilling to do so in a particular situation).

“Status-confirming” and “willful” violations rarely occur in HFR and are of lowest priority, so they aren’t addressed here.

Future management suggestions for HFR include overhauling the recreational social norms that exist at HFR through expanded display of the regulations, illustrating both the negative effects of uncontrolled dogs off-leash (i.e. threatening children/other dogs, frightening wildlife, and damaging salmon habitat and other resources) and the positive effects of leashed or properly trained unleashed dogs (good exercise, pleasure derived from a pleasant experience, others are not hassled, “natural” quality of HFR is maintained). The regulations for dogs are poorly displayed and under-enforced, with 51.0% of visitors surveyed saying they did not know or were unsure of what the policy was at HFR before visiting the area, and this has little to no effect convincing visitors to comply with them. A lack of knowledge about the reserve’s dog policy can alter visitor perceptions of dogs at the reserve, which can create more conflict. Enhancing the visibility and detail of the rules and consequences of violating them will reduce “uninformed” and “unintentional” violations.
Incorporating a moral element into the display of the rules can also have an effect on reducing “responsibility-denial” violations. About 16% of all visitors reported being disturbed by dogs at HFR, and 16.4% reported seeing resource impacts caused by dogs, both of which typically harm visitor experiences. Additionally, many participants commented on the fear they felt for their children when they saw dogs running at them unleashed, including one person who said “Dogs - one time encounter included 3 dogs off leash running and jumping on me and my kids w/ muddy paws. Frightened my young daughter.” If visitors are informed that unleashed dogs can ruin other visitors’ experiences at HFR and can potentially injure or scare children or wildlife (two things that have high moral value for HFR visitors), irresponsible dog owners would likely become more responsible. The number of alternative choices for visitors to HFR is limited, but highlighting other areas in the region that allow unleashed dogs and providing information for dog training businesses would also be beneficial in reducing “responsibility-denial” violations. HFR managers may also wish to include language threatening to rescind unleashed dog walking privileges of visitors determined to be inadequately following the regulations, which, coupled with increased visibility of the rules, would negate “responsibility-denial”-type violators’ negligent behavior.

As illustrated in studies by Williams et al. (2009) and Miller et al. (2001), a lack of visitor knowledge on the effects of dogs on wildlife and the environment inhibits compliance with leash laws. The BLM should begin an intensive campaign to educate visitors on the sensitive nature of HFR, and how dogs and improperly disposed dog excrement can have negative impacts on the wildlife and the natural resources of the
reserve. Over 67% of visitors participated in “nature study” and over 83% participated in “wildlife viewing” two of the most popular activities participated in at HFR. If properly educated, visitors would be more inclined to keep their dog under control and pick up their dog’s excrement in order to preserve the “natural” qualities of the reserve, which are highly valued by HFR users. Resource protection is the BLM’s primary management goal for HFR, and focusing attention on the recreational dog policy in this fashion would indirectly strengthen the agency’s ability to achieve that goal.

In addition to making the regulations more visible and educating the public, an increase in enforcement of the regulations would likely lead to an increase in compliance. Williams et al. (2009), Nesbitt (2009), the city of Boulder (2011), and the GGNRA’s report (2011) on their new dog management plan all identify the need to increase enforcement of existing and future regulations to increase visitor compliance, and Gramman and Vander Stoep (1987) identified increased enforcement as a critical element in reducing “releasor-cue”, “responsibility-denial”, and “status-confirming” violations. Headwaters Forest Reserve has only one full-time ranger available to patrol the entirety of the reserve open to the public, which is insufficient for proper enforcement of the current regulations. Increasing enforcement after implementing an educational/communicative program to change inherent visitor attitudes would make it most effective---like a one-two punch. Personal freedom is a crucial element to the recreational experience (79.9% of HFR visitors listed personal freedom as “important” or “very important” to their trip, and on average the BLM received high marks for fostering it at HFR), and blanket restrictions and prohibitions on unleashed dogs would likely
constrict visitors’ senses of personal freedom to such a degree to elicit unwanted backlash
from the public. While the results of the survey at Headwaters indicate that the level of
conflict between visitors with dogs and visitors without is not exceedingly high, these
measures are simple and easy for the BLM to undertake, and reducing preexisting
conflict would benefit all visitors to the reserve in the future, especially as the number of
visitors to HFR continues to increase annually.
REFERENCES


Appendix A. On-site interview questionnaire.

Headwaters Forest Reserve Visitor Use Survey

On-Site Contact 2012

For the Research Technician:

1. Group ID Number:______________________
2. Interviewer:____________________________
3. Date:________________________________
4. Time:______:______ (24 hour clock)

1. How would you describe your group?
   
   alone ( )
   family only ( )
   friends only ( )
   family and friends ( )
   organized club or school group ( )
   other; please specify ____________________________

2. How many people are in your group, including yourself?_______________________

3. Is this your first visit to the Headwaters Forest Reserve?   Y   N

4. If No, including this trip approximately how many times have you visited Headwaters Forest Reserve? ______

5. Do you have a dog with you today?   Y   N

6. Are you now entering or leaving the Headwaters Forest?   entering
   leaving
   a. If leaving, when did you enter? _________ time (24 hour clock)
   b. If entering, when do you anticipate leaving? _________ time (24 hour clock)
c. Enter visit duration in minutes ________________

7. If you are now leaving, how far did your party travel on the trail on your visit? Please describe the farthest point you reached.

________________________________________________________________________

8. We would like to send a questionnaire to your home to get information on your use, enjoyment and management preferences for the Headwaters Forest. Could we do that? The BLM is trying to protect the Headwaters Forest and also provide the best possible recreational experiences. To do this we need your help. If we sent a questionnaire to you, would you be willing to fill it out and mail it back in the postage-paid envelope?

Collect up to two names and addresses from different households.

| Name | Address (Street, City, State, Zip) |

THANK YOU!

Public reporting burden for this collection of information is estimated to average 7 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Agriculture, Clearance Officer, OIRM, Room 404-W, Washington, DC 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB #1004-0202, Exp. 06/30/2015), Washington, DC 20503
Appendix B. Written (mail-back) survey.

Headwaters Forest Reserve Visitor Use Survey
The abbreviations “HFR” and “BLM” will be used frequently throughout this survey. “HFR” refers to the Headwaters Forest Reserve, and “BLM” refers to the Bureau of Land Management.

1. How many people, including yourself, were in your group on this visit to Headwaters Forest Reserve? _____
   How many people per vehicle? _____
   How many adults? _____
   How many children (< 18 years old)? _____
   How many dogs? _____

b. What time of day did your group arrive at Headwaters Forest Reserve? _____

c. About how long did your visit last?
   ( ) less than 1 hour
   ( ) between 1 to 2 hours
   ( ) between 2 to 4 hours
   ( ) more than 4 hours

d. How far did your party travel on the trail during your visit? Please check the farthest point you reached.
   A. Educational Center (Barn) _____
   B. Falk (end of pavement) _____
   C. First Bridge (2-mile bridge) _____
   D. Second Bridge (3-mile bridge) _____
   E. Between 3-mile bridge and before beginning of old-growth loop trail _____
   F. End of trail (old-growth loop trail) _____

e. Did you bring a dog with you on this visit to HFR?
   ( ) Yes        ( ) No        ( ) Don’t Remember
2. How often do you visit HFR?
( ) 1 time per week or more
( ) 1-2 times per month
( ) once every few months
( ) 1-2 times per year or fewer
( ) This is my first visit

3. Which activities did you participate in during this visit to HFR, and how important was each activity to your decision to make this trip? Please check one of three responses for each activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>This activity was a major reason for this trip</th>
<th>Participated, but not a major reason for this trip</th>
<th>Did not participate in this activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking on trails</td>
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<td>( )</td>
</tr>
<tr>
<td>Spending time alone</td>
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<tr>
<td>Socializing</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>Nature study</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>History or cultural study</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>Wildlife viewing</td>
<td>( )</td>
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</tr>
<tr>
<td>Photography</td>
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<td>( )</td>
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<tr>
<td>Geocaching</td>
<td>( )</td>
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<tr>
<td>Questing</td>
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<td>( )</td>
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<tr>
<td>Dog walking</td>
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<tr>
<td>Wheelchair use</td>
<td>( )</td>
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</tr>
<tr>
<td>Biking</td>
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<tr>
<td>Other</td>
<td>( )</td>
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</tbody>
</table>

If “Other”, please describe: ________________________________________________________________
4. Area managers would like to know how people learn about HFR so they can improve the quality of visitor information. Please choose your top three information sources by circling their numbers.

1. Personal experience
2. Friends or relatives
3. Magazine articles
4. Newspaper articles
5. Maps
6. Books
7. Information from the BLM
8. Information from other state or federal land management agencies
9. Local Chamber of Commerce
10. BLM website
11. Website of other state or federal land management agency
12. Outdoors Cool! Website or other website
13. TV ads
14. Other

5. Please tell us which three types of information you would find most helpful in planning your trip to HFR. Check up to three types.

Information on:
( ) Safety
( ) Specific trail descriptions
( ) Natural resource values of the area
( ) Cultural/historical resource values of the area
( ) Directions to trailheads
( ) Available facilities
( ) Maps
( ) Recommended items to pack along
( ) Rules/regulations
( ) Recreation opportunities
( ) General weather conditions of the area
( ) Other

6. Please estimate:
   (a) the number of other visitors you saw on this visit to HFR: ____
   (b) the number of other visitors with dogs you saw: ____
7. How did you feel about the number of other visitors you saw during your visit to HFR?

( ) Saw too many
( ) Saw about the right number
( ) Saw too few
( ) Does not matter to me

8. Did you notice any impacts to the HFR environment that you believe were caused by other visitors?

( ) No
( ) Yes. If yes, please describe the impact(s) to the HFR environment that you noticed:
_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

9. Did the behavior of any other group or individual interfere with your enjoyment of HFR on this visit?

( ) No
( ) Yes. If yes, please describe what type of behavior interfered with your enjoyment of HFR:
_____________________________________________________________
_____________________________________________________________
_____________________________________________________________
10. The BLM would like to know your opinion on the current dog policy, and the number of people and their dogs that use HFR. Please answer the following questions as best as you can.

**Current BLM Policy:** “Dogs must be under voice control of the owner at all times, or on a leash. Dogs are only allowed on the Elk River Corridor Trail.”

a. Did you know what the current dog policy was for HFR before taking this survey?
   ___Yes       No___

b. Do you believe the rule requiring dogs be kept under voice control is working?
   ___Yes       No___        Don’t Know___

c. Do you believe the rules and regulations concerning dogs are adequately displayed?
   ___Yes       No___        Don’t Know___

d. Do you believe the rules and regulations concerning dogs are adequately enforced by BLM law enforcement at the area?
   ___Yes       No___        Don’t Know___

e. Have you ever brought a dog to the area?
   ___Yes       No___

   If Yes, do you bring a leash for your dog(s)?
   ___Always
   ___Sometimes
   ___Rarely
   ___Never
f. Has the primary reason for any of your previous visits to HFR been for dog walking?

___Yes ___No

If Yes, how often?

( ) 1 time per week or more
( ) 1-2 times per month
( ) once every few months
( ) 1-2 times per year or fewer

g. If you visit with dogs, do you ever visit HFR specifically because no leash is required for your dog(s)?

___Yes ___No ___N/A (don’t bring dogs)___

h. On any of your visits to HFR, have you ever been bothered by dogs?

___Yes ___No

If yes, please explain the nature of the disturbance:

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

i. On any of your visits to HFR, have you witnessed a dog impacting the natural environment?

___Yes ___No

If yes, please explain the nature of the impact:

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________
j. Do you believe the BLM should implement a more restrictive dog policy?

___Yes  No___

If yes, please explain what you feel should be done:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

k. Please indicate the degree to which you would support or oppose each of the following:

<table>
<thead>
<tr>
<th>Option</th>
<th>Strongly Support</th>
<th>Somewhat Support</th>
<th>Neutral</th>
<th>Somewhat Oppose</th>
<th>Oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. require all dogs to be on leash</td>
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<tr>
<td>b. prohibit dogs from HFR</td>
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<tr>
<td>c. allow dogs only on weekdays</td>
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<tr>
<td>d. maintain existing voice control policy</td>
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</tbody>
</table>

l. If the policy on dogs was to be made more restrictive, would you be more likely or less likely to visit the area?

___More likely  Less likely___  No change___
11. The following items are problems you may have encountered on your visit to HFR. Please indicate how much of a problem each item was for you.

<table>
<thead>
<tr>
<th></th>
<th>Major Problem</th>
<th>Moderate Problem</th>
<th>Minor Problem</th>
<th>Not a Problem</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Possible Resource Problems</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a. Trails poorly maintained</td>
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<tr>
<td>b. Trails poorly marked</td>
<td>( )</td>
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<tr>
<td>c. Trail erosion</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>d. Polluted streams</td>
<td>( )</td>
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<tr>
<td><strong>Possible Management Problems</strong></td>
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<tr>
<td>e. Not enough trails through the area</td>
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<tr>
<td>f. Not enough parking spaces at entry points</td>
<td>( )</td>
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<tr>
<td>g. Not enough information available on the area’s natural and cultural history</td>
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<tr>
<td>h. Too many rules and regulations</td>
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</tr>
</tbody>
</table>
Major Problem Moderate Problem Minor Problem Not a Problem Don’t Know

i. Area rules and regulations not well publicized ( ) ( ) ( ) ( ) ( )

j. Not enough information about trails ( ) ( ) ( ) ( ) ( )

k. Not enough information on number of other users ( ) ( ) ( ) ( ) ( )

l. Not enough information on when the area is heavily used ( ) ( ) ( ) ( ) ( )

Possible People Problems

m. Litter ( ) ( ) ( ) ( ) ( )

n. Dog waste ( ) ( ) ( ) ( ) ( )

o. Vandalism ( ) ( ) ( ) ( ) ( )

p. Pets off leash ( ) ( ) ( ) ( ) ( )

q. Rowdy or noisy people ( ) ( ) ( ) ( ) ( )

r. Too many large groups ( ) ( ) ( ) ( ) ( )

s. Too many people in the area at the same time ( ) ( ) ( ) ( ) ( )

t. Bicyclist issues ( ) ( ) ( ) ( ) ( )
12. Please indicate how important each of the following services was to you when you planned for and visited HFR. Then, using a school report card format, please grade the BLM with an A (excellent), B (above average or very good), C (average), D (below average or not very good), F (failing), or DK (Don’t Know) to let us know how well you think the BLM is managing the area with regard to each of these services.

<table>
<thead>
<tr>
<th>Service Description</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Not Very Important</th>
<th>Grade for BLM</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Information signs at trailheads have necessary information</td>
<td>( )</td>
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<tr>
<td>b. Helpful directional signs to the area</td>
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<tr>
<td>c. Clean restrooms</td>
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<tr>
<td>d. Access roads in good condition</td>
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<tr>
<td>e. Adequate parking</td>
<td>( )</td>
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<tr>
<td>f. Telephone requests handled without delay</td>
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<tr>
<td>g. Prompt response to email requests</td>
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<tr>
<td>h. BLM people in the area are friendly and courteous</td>
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</tr>
<tr>
<td></td>
<td>Very Important</td>
<td>Somewhat Important</td>
<td>Not Very Important</td>
<td>Grade for BLM</td>
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<td>--------------------------</td>
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<tr>
<td>i. BLM people in the area are professional and competent</td>
<td>( )</td>
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<tr>
<td>j. Your vehicle is safe from the threat of vandalism</td>
<td>( )</td>
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</tr>
<tr>
<td>k. Managers notify you of natural hazards in the area</td>
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<tr>
<td>l. BLM office open during convenient times</td>
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<tr>
<td>m. Able to leave a phone message for managers after hours</td>
<td>( )</td>
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<tr>
<td>n. Opportunity for personal freedom without too much restriction by managers</td>
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<tr>
<td>o. Able to find a BLM person when needed</td>
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<tr>
<td>p. Brochures/maps clearly communicate information about recreation opportunities</td>
<td>( )</td>
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</tbody>
</table>
13. Please check any of the following activities that you participated in during your visit to HFR:

( ) Interpretive/guided hike

( ) Environmental education program at HFR Education Center

( ) School group program

( ) Lecture series event at HFR Education Center

( ) None

14. Please indicate your support for or opposition to each potential management action listed below by checking the appropriate box.

<table>
<thead>
<tr>
<th>Possible Management Actions</th>
<th>Strongly Support</th>
<th>Somewhat Support</th>
<th>Somewhat Neutral</th>
<th>Somewhat Oppose</th>
<th>Strongly Oppose</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Expand the trail system</td>
<td>( )</td>
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<td>b. Charge a small use fee</td>
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<td>c. Have a donation box at the trailhead</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>d. Expand trailhead parking</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>e. Acquire additional land to add to the reserve</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>f. Provide more educational signs about the plants and animals</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>g. Provide more educational signs about the area’s history</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
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</tbody>
</table>
15. HFR opened to the public in 1999. Please explain below how well you think the BLM has managed HFR since the area’s opening.

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Good</th>
<th>Okay/Average</th>
<th>Poor</th>
<th>Unsure/Average</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Trail maintenance</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
<td>( )</td>
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<tr>
<td>b. Forest restoration (thinning)</td>
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<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>c. Watershed restoration (road removal)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>d. Interpretation and environmental education (signs, hikes, programs)</td>
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<td>( )</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
</tbody>
</table>

16. What did you like **most** about your experience at HFR?

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

17. What did you like **least** about your experience at HFR?

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

18. Did your experience at HFR meet your expectations?

( ) Yes  
( ) No  

Please explain: __________________________________________________________
_____________________________________________________________
_____________________________________________________________
Finally, in order to make comparisons with visitors to other similar areas, we would like some general information about you. All information is anonymous and will not be identified with your name.

19. Do you belong to any of the following? (Check all that apply)

- [ ] Hiking clubs or organizations
- [ ] Sportsman clubs or organizations
- [ ] Conservation or environmental organizations
- [ ] Historical/cultural groups or organizations

20. What is your age? ________ years

21. What is the gender with which you most associate? [ ] Male [ ] Female

22. Are you Hispanic or Latino? (A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.)

- [ ] Yes [ ] No

23. Please select the racial category or categories with which you most closely identify by placing an “X” in the appropriate box. Check as many as apply.

- [ ] American Indian or Alaska Native
- [ ] Asian
- [ ] Black or African-American
- [ ] Native Hawaiian or other Pacific Islander
- [ ] White

24. What is the highest level of education you have attained? (Circle number)

- Grade School: 8 years or less
- High School: 9 10 11 12
- College: 13 14 15 16
- Graduate School: more than 16

25. Are you currently a student?

- [ ] Yes: full time [ ] part time [ ]
- [ ] No

26. So that the BLM can know where most of their Headwaters visitors come from, please provide your postal zip code.

___________

Thank you for taking the time to complete this questionnaire. Space is provided on the next page for any additional comments you would like to make.
Are there any other issues that HFR managers need to address or any other comments you would like to make about the area and its management?

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Appendix C. Selected comments made by visitors for survey question #10h.

Question #10h: “On any of your visits to HFR, have you ever been bothered by dogs?”

“Other dogs running up to my leashed dog.”

“Dogs jumping up on us and having to walk around dogs.”

“Dogs are more fun to see than people.”

“No but the potential is there.”

“Daughter scared by off leash dog who approached us.”

“I love all dogs!”

“Owners aren't conscious of others with dogs. I keep mine on a leash and shouldn't have to defend my dog from other's dogs that don't listen. Those dogs need to be kept on a leash.”

“We've been greeted by dogs and the people walking them, but have never had a problem.”
Appendix D. Selected comments made by visitors for survey question #10i.

Question #10i: “On any of your visits to HFR, have you ever witnessed a dog impacting the natural environment?”

“I let my dog swim in the river a few times before I realized you weren't supposed to do that.”

“Sometimes people let their dogs swim near the big leaf maples.”

“I know the dogs are not suppose to go in the water, yet people always let their dogs swim.”

“Dogs allowed and even encouraged by their owners to get in the river - disturbing fish habitat. People don't always ‘pick up’ after their dogs.”

“Dog poop on trail that wasn't picked up.”

“Dogs defecating in bush. Dogs exploring off trail.”

“Pooping and owner not picking it up.”

Appendix E. Selected comments made by visitors for survey question #10j.
Question #10j: “Do you believe the BLM should implement a more restrictive dog policy?”

“As long as there is enforcement and public cooperation.”

“Clean up dog poop.”

“Leash 100% time within HFR.”

“Leash only, real simple. Allows those with phobias or other issues to be more relaxed. Less environmental impact.”

“It has been my experience in the past in other parks/beaches, that dogs under ‘voice control’ are not. While I did not see this at HFR, clearly there is potential for hikers to abuse this rule. Suggestion: Dogs on leash to end of paved trail at Falk town site.”

“NO dogs allowed off leash. No dogs beyond paved section. No dogs off path. A fee for bringing a dog, per dog, paid monthly or per visit. To pay for cleanup and habitat destruction $30.00/month or $10/visit. Finally stiff penalties for infracting dog rules. IE $250 for not carry out dog feces.”

“Things seem to be working. I do wonder how well the voice control will work, but so far as I've seen so good...”

“I think it is great for people to be able to walk their dogs but I think the leash laws should be strictly enforced.”

“Not sure. I don't know how BLM can change a mindset that doesn't include personal responsibility.”

“I've only visited once but I believe dogs should be on leash where other people and dogs are around. Not all dogs "get along" and not all people like dogs. Voice control is not adequate in my opinion. I have no problems with dogs, it is the owner of the dog - are they paying attention to their dog and do they really have voice control of their dog?”

“Many dog owners afford more civility and courtesy to their dogs than to their fellow man. Dogs have become more important than people. Maybe they are.”