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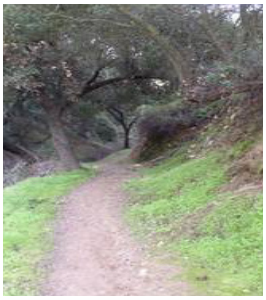

Park Visitor User Survey for the Puente Hills Landfill Native Habitat Preservation Authority

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Prepared for: The Puente Hills Landfill Native Habitat Authority

Cover Photo: Trails in the Puente Hills

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Executive Summary

Methodology and objectives

This report presents the results of a study conducted for the Puente Hills Landfill Native Habitat Preservation Authority (hereafter Habitat Authority). A survey was carried out in the Puente Hills during two weekdays and two weekend days during the month of October 2005. The survey was conducted among park users, in addition, user counts were conducted by interviewers in five park entrances – Hacienda Hills Trailhead, Arroyo Pescadero, Turnbull Canyon, Powder Canyon, and Hellman Park. A total of 371 surveys were completed over a total count of 916 users, providing a users "n" of 6870, a margin of error of 5%, a confidence of 95% over a p-q=0.5. The surveys were complemented by a counting exercise performed by interviewers using a "count form" instrument. This instrument helped determine whether particular activities, races (white or non-white), or gender were underrepresented in the surveys. It also provided an accurate number of actual users per day, per entrance, and per activity.

The main objectives of the survey were to collect information on user demographics, attitudes towards nature and the park, towards park uses and management, and about trail use, particularly activities performed, number of users per trail, and interaction among users.

Data collected

Demographics
Demographic results show a high gender imbalance in the use of the park with a majority of male users, particularly in Turnbull Canyon where the main activity of those using this trailhead is mountain biking. A majority of the users are either white (around 40%) or Hispanic (around 40%), with Asians coming next with less than 10%.

Activities
Hiking is the most prevalent activity in the park. However, depending on which trailhead one is using, the prevalence of one type of activity or the other might differ. Biking for example was the main activity in Turnbull Canyon, but hiking was by far the most practiced activity in Arroyo Pescadero and Hacienda Hills Trailhead. In terms of reasons to visit the park the most common ones are "to exercise" and "to be outdoors".

Trail use
Regarding trail use, the most common reasons for choosing a particular trail are its length, the scenic views and the trailhead location. More than 60% of the users either always or most of the time use the same trail. In terms of management options for the trails, there is a relative support for temporary trail closure for wildlife conservation, but also a relative opposition to permanent closure proposed for the same conservation objective.

Attitudes

Attitudes towards nature and park management are relatively positive towards conservation over recreational use. This however differs by trailhead and age group for example, and it will very much depend on the type of management to be conducted and on the communication strategies. A majority of users consider that conservation should be a priority over recreation. Moreover, perceptions of nature are generally positive, users enjoy their interactions with wildlife in the park and would support conservation and restoration efforts.

Sources of information

Observation, living in the area and previous visits are regarded as the most important sources of knowledge about the park. Related to the last point – previous visits – is the importance given to park signs as sources of knowledge, which comes after observation, living in the area and previous visits, and before any of the written and oral information sources – including friends, internet, brochures, newspapers, etc. Regarding knowledge of rules, most users (78%) state they know the park rules.

Users interaction

Interaction between users goes mostly without frictions. Only 42% answered that other users' activities affect – positively or negatively – their use of the park. Among this 42%, perceptions of joggers and hikers are mostly positive, and only bikers, dog walkers, and to lesser extent horseback riders seem to negatively affect other users' enjoyment of the park. The main reasons why perceptions are negative are litter, animal wastes and risk of collision with other users. Coping mechanisms are already in place for half of that 42%. They vary from taking extra precaution (main response) to change time, day of frequency of park use. It is important for management authorities to remain informed about these trends to avoid adaptation that would cover future changes in use of the park.

Transportation

A high percentage (more than 70%) of users travel to the park by private automobile. However, and relative to other parks like the Santa Monica Mountains for example, a significant percentage (almost 25%) either bikes, walks or jogs to the park. This at the same time highlights the importance of the park for local residents who are able to enjoy the trails and contact with nature (among the main reasons) without having to get into their cars.

Barriers

A relatively high percentage of users (26%) stated they have experienced barriers in accessing the park. Powder Canyon and Arroyo Pescadero are the entrances with higher numbers of users stating they have experienced barriers. These perceived barriers might be related to the need to close gates after heavy rain in the park.

Recommendations

Support for conservation measures inside the park is relatively strong, even if they imply restricting some of the recreational uses. These restrictions should be carefully managed and communicated, with conservation biology reasons being an important part of the communication strategy.

Regarding means of communication, direct contact with users appears to be the most effective outreach strategy. Due to restrictions on rangers' time, park signs are an important source of information that needs to be further explored and exploited.

The park has an important percentage of users who visit it for some kind of solitude. Although the data does not provide information on trends, it is important to remain vigilant regarding coping mechanisms that seem to exist and could affect visitors' experience of the park.

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Introduction and literature review

Literature Review

Importance of urban conservation

The Puente-Chino Hills represent a peninsula of natural habitat that extends into the urbanized Los Angeles Basin. The region still supports top predators (e.g., puma, bobcat) and other sensitive bird and mammal species (Spencer 2005) in a context that is accessible to recreational visitors. It would play an important role in connecting habitats along the San Gabriel River to larger blocks of wilderness to the east. Cooper (2002) documented a number of sensitive bird species that are currently in decline, and found habitat specialists still present even in the more urbanized western portion of the hills, including threatened California gnatcatchers. Emerging research by Fernandez-Juricic and others discussed above raises the question of how much recreational use would be compatible with the persistence of these important species.

Habitat destruction and fragmentation are major concerns in conservation biology and are the main causes of biodiversity loss (Wilcox and Murphy 1985). Habitat fragmentation becomes a major challenge for conservation biologists because of its intensity in urban areas and the composition of the urban matrix. Efforts to assess the quality and degree of isolation of remaining patches, and to improve connectivity among them, should therefore be an urban conservation priority. Fragmentation can also be a concern inside reserves (e.g. recreational paths), and it is important to understand and assess its impacts.

Urban reserves sometimes represent crucial elements for conservation at both local and regional scales. Studies in urban areas highlight the importance of managing the local and regional scale for effective conservation biology (Fernandez-Juricic and Jokimaki 2001; Melles *et. al.* 2003). “Multiple elements of the landscape mosaic at both local and landscape scales are important in determining the distribution of birds in urban areas, so parks and areas surrounding parks and reserves should be integrated into urban planning and development designs” (Melles *et. al.* 2003: n/p). Moreover, small urban parks that might not be suitable as functional habitat could work as stepping stones between suitable habitat (Fernandez-Juricic and Jokimaki 2001, but see Kondo and Nakagoshi 2002 who conclude that some birds prefer continuous small forests over stepping stones, even if it is a longer route).

Perceptions of nature

There is ample literature related to perceptions of nature and parks, and much of it highlights the importance of understanding these perceptions to effective management (Durbin and Ralambo

1994; Raval 1994; Richards 1996; Burger 1998; Murombedzi 1999; Mehta and Heinen 2001; Rao *et. al.* 2003; Anthony *et. al.* 2004).

Perception, preferences and use of nature, parks and recreational activities are influenced by gender, age, income, education, childhood, and ethnicity (Dwyer and Hutchinson 1990; Irwin *et. al.* 1990; Wallace and Witter 1992; Tunstall and Penning-Rowsell 1998; Virden and Walker 1999; Bixler *et. al.* 2002; Priskin 2003; Wolch and Zhang 2004).

Impacts of trail use on wildlife can vary depending on intensity and type of use. A thorough knowledge of the number of users and type of recreational activities inside the park is essential for planning and management of biological and recreational aspects inside the park. Also important is to understand users' perceptions of nature and the park itself.

Conflicts

The source of diverse perceptions of nature and use preferences can at the same time be a source of conflict. Different ethnicities might have different levels of tolerance towards crowding, or regard ideal park conditions in different ways. Dwyer and Hutchison (1990) for example, found that Anglos preferred parks with fewer facilities than African Americans. In some cases conflicts may arise from different types of uses or approaches to recreation, the cases of snowmobiles and cross-country skiers (Vitterso *et. al.* 2004), or jet-ski and other beach users (Roe and Benson 2001) are clear examples.

Some conflicts might be less evident or less vocal, but it is nevertheless important to find out if users have developed a coping mechanism that allows them to continue using a shared open space resource. Coping with crowding, for example, could discourage use, but be undetected as user numbers may not decline. The incoming or remaining users will be more resilient to crowding than the previous ones, so while user numbers might not decline the facility's function might be changing and/or many of its users might be dealing with stressful crowding conditions (Manning and Valliere 2001).

This report is designed as an aid to better understand park users' perceptions of trails, park, park management, and nature. Park management strategies, both social and ecological, can benefit from knowing, for example, why people visit certain areas instead of others, or what kind of expectations they have when they visit the Preserve. Due to the park's diversity and complexity, with several different entrances and types of users, the report also provides an analysis per trailhead to allow a more in-depth understanding of a heterogeneous mix of trails and users.

Methodology

In this section we describe the methodology used for the surveys. The survey instrument was developed by the Center for Sustainable Cities in consultation with the Habitat Authority and its rangers. The survey instrument and methodology were reviewed and approved by the University of Southern California's Institutional Review Board.

Survey instrument

The main objectives of the survey instrument (attached in appendix 1) were to obtain information on the following:

- Demographics
- Attitudes
    - Towards park and nature
    - Towards park uses
    - Towards management
- Trail use
    - Related to current data on vegetation and wildlife
    - Related to activities
    - Numbers
    - Possible impacts

The demographic information collected included, gender, age, race, household income, nationality, language, and education. All demographic information was "cross-tabbed" with information on attitudes and trail use to analyze potential correspondences.

Information on attitudes and perceptions was collected using different techniques inside the survey instrument. Most of the questions have been used and validated in previous studies. The main objective of these questions was to understand perceptions of nature, particularly related to the Puente Hills area. Questions to clarify perceptions of park management were included specifically relating to "attitudes" and to "trail use". Perceptions questions were complemented with the use of trail pictures provided by the Habitat Authority. These were designed to obtain information on trail preferences. We used 3 sets of 6 pictures (see appendix 3), Set A had wide trails without dense vegetation, set B had relatively narrow trails with vegetation, and set C had relatively wide trails with vegetation.

Trail use questions where complemented with a map for each trailhead. This map was used to obtain information on intensity of trail use, type of use per trail and to test potential opposition to closure of certain trails.

Count form

A “counter form” (see appendix 2) was developed in order to obtain the number of users, and information of non-respondents. The form was filled out by observers and designed to be easy and fast to fill up in order to obtain basic important information during peak use hours. Information obtained with the counter form included response/non-response when asked to complete the survey, gender, race (white or non-white), approximate age, type of use, and time of visit. The count form also included a “calibration” mechanism (described in “counter form administration” section).

In the “response rate” section we provide non-response information obtained with the counter forms. Graphs with all the results obtained from the counter form are included in appendix 4.

Survey instrument administration

Surveys where performed on four different days during the month of October 2005: Friday the 14th, Saturday the 15th, Friday the 21st and Sunday the 23rd. On Friday the 14th and during the morning of Saturday the 15th we had interviewers placed on a 6th entrance, but because not a single person visited the trailhead during that time we decided to relocate the interviewers to other entrances. Surveys on Friday the 14th started a 8:30-9:00AM and ended at 6:00PM, the rest of the days we had at least one interviewer on all entrances from 6:00AM to 7:00PM. Friday the 21st was the first day the park opened its gate after a 48-hour closure due to rain. Sunday the 23rd started with some dense fog patches in parts of the hills. The rest of the days where sunny and relatively hot.

Each trailhead had two persons at all time, one in charge of interviewing and the other as observer to fill up the counter form, in some of the trailheads the observer would help with the interviews if it was necessary to ask everyone entering the park to fill up the survey. The only trailhead that required an observer at full capacity was Turnbull Canyon during the early morning hours of the weekends and Hacienda Hills Trailhead at peak times. These entrances had three or four people interviewing at peak hours.

Interviewers identified themselves as USC students conducting a survey on park use and explained it was not mandatory to complete the survey. Users under 18 were not interviewed, when in doubt about the age interviewers would ask visitors before giving the survey.

Whenever it was possible, and that is most of the time except peak morning hours in Turnbull Canyon, everyone entering the park was asked to participate in the survey. Neither money nor “treats” were given to complete the survey, but DVDs and magnets from the Habitat Authority were given away to respondents. There where many respondents who requested to have the trail maps used for the survey, as much as it was possible we explained we had limited numbers and that they should contact the Habitat Authority to obtain information on the trails.

The survey was self administered by park users that agreed to complete it. They were also assisted by the interviewers since some of the questions required the interviewee to observe a set of trail images and one question included highlighting the used/to be used trail on a map. Interviewers had a map with the location of the trailhead and were provided a highlighter to show the trails they had just visited or they were planning to visit. Some interviewees complained about the length of the survey, but very few withdrew before completing the entire questionnaire.

Counter form administration

As explained above, each trailhead had at least two persons working, one interviewer in charge of administering the survey and one observer in charge of administering the counter form. The observer would fill up the form as users exited the park. The information required was basic and the form easy to fill up. It proved to be a valuable tool at peak hours, particularly at Turnbull Canyon.

In order to verify the accuracy of the age and race observation, observers would fill up the form and after then consult with the interviewer after an interview was completed. The observer would verify if his/her observations were correct or incorrect by looking at the age, activity and race questions in the survey instrument. This was done as often as possible. Accuracy in race observations was over 80% and age over 70%.

Data entry and analysis

Completed questionnaires were collected every day and taken back to USC. After the four days of surveying a day for data entry was determined and interviewers entered the data into Excel. This was the database software familiar to most interviewers. A few questionnaires were entered on a later date by selected interviewers. The data was then transferred to SPSS software and analyzed with that software. SPSS is commonly used in sociological research and statistics.

Maps were developed based on GIS trail data provided by the Habitat Authority and using data mainly from questions 6 and 7 – trail used and closure opposition respectively. Maps were created using ARCGIS from ESRI.

Survey results and analysis

In this section we start by describing the results of the survey. To describe response rate and trail use data we use information obtained from the survey instrument and the counter form. Then we present descriptive results from the survey and, finally, we analyze the data using cross tabulations and comparative descriptions per entrance.

Response rate

Over the four days 916 users were counted in all five trailheads. A total of 371 completed surveys were obtained. Tables 1 and 2 show the number of surveys obtained at each trailhead and the number of completed surveys obtained each day. Table 3 presents the number of users per trailhead and the percentage of users interviewed at each trailhead.

Table 1
Number of surveys per trailhead

Survey site	Count	Percent
Turnbull Canyon	127	34.2
Arroyo Pescadero	82	22.1
Hacienda Hills Trailhead	72	19.4
Hellman Park	53	14.3
Powder Canyon	37	10
Total	371	100

Table 2
Number of surveys per survey date

Date	Count	Percent
1st Friday	47	12.7
Saturday	134	36.1
2nd Friday	62	16.7
Sunday	128	34.5
Total	371	100

Table 3
Total counts and % of interviews per trailhead

	Arroyo Pescadero	Hacienda Hills Trailhead	Hellman Park	Powder Canyon	Turnbull Canyon
Total count 4 days	176	221	163	64	292
Total surveys	82	72	53	37	127
% of users interviewed	47%	34%	33%	58%	44%

Turnbull Canyon is clearly the trailhead with the most traffic in the park. At the beginning of the survey we decided to interview users entering or exiting the trailhead, but to count only those exiting to avoid double counting – as people can remind you they have filled the interview already, but they are not aware they are being counted. Actual use of Turnbull Canyon might be higher than our numbers show. The rest of the trailheads have a clearly defined entrance and most users enter and exit through the same place. This is not the case with Turnbull Canyon, where many users, mainly mountain-bikers use the entrance but exit on different parts of the park.

The higher response rate obtained at Powder Canyon quite likely responds to the low traffic. It was very easy for interviewers to approach users and probably very hard for users to say no to interviewers who had been waiting for some time to get interviewing candidates.

The second and third columns of tables 4 to 8 show data obtained from the survey instruments, the fourth and fifth columns show non-respondents data obtained using the counter forms. In general non-respondents do not differ based on gender, race or activity. There are however a few exemptions (in light orange) with under-representation of non-whites in Arroyo Pescadero, males in Hacienda Hills Trailhead, dog walkers in Powder Canyon and bikers in Turnbull Canyon. This last is probably due to the high peak volume at the early hours of the weekends, which was mainly composed of bikers. Even though we had up to five interviewers at the site, it was hard to approach every user entering the park at the time.

Table 4
Arroyo Pescadero – Non-respondents data

			Non-respondents	
Gender	**Count**	**%**	**Count**	**%**
Male	102	57.95	49	56.98
Female	74	42.05	36	41.86
Race	**Count**	**%**	**Count**	**%**
White	108	61.36	47	54.65
Non white	68	38.64	39	45.35
Activity	**Count**	**%**	**Count**	**%**
Hiking	136	77.27	68	79.07
Running	14	7.95	9	10.47
Biking	1	0.57	1	1.16
Dog Walk	25	14.20	8	9.30

Table 5
Hacienda Hills Trailhead – Non-respondents data

			Non-respondents	
Gender	**Count**	**%**	**Count**	**%**
Male	148	66.97	88	77.88
Female	73	33.03	27	23.89
Race	**Count**	**%**	**Count**	**%**
White	71	32.13	33	29.20
Non white	148	66.97	82	72.57
Activity	**Count**	**%**	**Count**	**%**
Hiking	164	74.21	86	76.11
Running	18	8.14	14	12.39
Biking	6	2.71	4	3.54
Dog Walk	26	11.76	8	7.08

Table 6
Hellman Park – Non-respondents data

			Non-respondents	
Gender	**Count**	**%**	**Count**	**%**
Male	122	75.78	31	72.09
Female	39	24.22	12	27.91
Race	**Count**	**%**	**Count**	**%**
White	91	56.88	24	57.14
Non white	69	43.13	18	42.86
Activity	**Count**	**%**	**Count**	**%**
Hiking	103	64.38	26	60.47
Running	11	6.88	2	4.65
Biking	31	19.38	10	23.26
Dog Walk	15	9.38	5	11.63

Table 7
Powder Canyon – Non-respondents data

			Non-respondents	
Gender	**Count**	**%**	**Count**	**%**
Male	45	70.31	12	66.67
Female	19	29.69	6	33.33
Race	**Count**	**%**	**Count**	**%**
White	44	67.69	11	61.11
Non white	21	32.31	7	38.89
Activity	**Count**	**%**	**Count**	**%**
Hiking	28	50.00	7	46.67
Running	11	19.64	5	33.33
Biking	10	17.86	3	20.00
Dog Walk	7	12.50	0	0.00

Table 8 Turnbull Canyon – Non-respondents data				
			Non-respondents	
Gender	**Count**	**%**	**Count**	**%**
Male	229	78.42	98	72.59
Female	63	21.58	37	27.41
Race	**Count**	**%**	**Count**	**%**
White	129	44.64	63	47.73
Non white	160	55.36	69	52.27
Activity	**Count**	**%**	**Count**	**%**
Hiking	76	27.14	40	32.52
Running	64	22.86	36	29.27
Biking	115	41.07	36	29.27
Dog Walk	25	8.93	11	8.94

Results confidence

We had a total of 916 park users counted during the 4 days of surveying and counting. Assuming that we can project those days to the rest of the month we reach a number of users per month (N) of 6870. Projecting the month this way gives us a higher N number of users than projecting the 2 weekdays data to 20-22 and the 2 weekend days data to 8-10 and is therefore safer. Projecting it the way we did we obtain an artificially higher number, and even with this number (6870) we obtain a 5% margin of error 95% of the time (see table 9).

Table 9 Confidence								
			Confidence	**PROPORTION (p-q)**				
E	**N**			0.9	0.8	0.7	0.6	0.5
5%	**6870**							
			99%	225	389	502	568	590
			95%	136	237	308	350	364

Results

In this section we will present the results in an order similar to the survey instrument, that is, we start with general park use and trail use questions and then we describe attitudes towards the park and demographics. Demographics are also introduced in relation to each question when statistical significance was found between responses and particular demographics. In terms of trailheads, we start describing the results for the entire park and then we analyze some significant results per trailhead, nevertheless, we introduce comments and comparisons between entrances when it is particularly relevant to one question being analyzed.

Frequency and duration of visits

Tables 10 and 11 show, respectively, percentage of first time users and time spent in the park. A few times a year can be 2 visits per month or 20 visits per month. The number of first time users is relatively high (44%) if we consider that, as table 12 shows, 65% of the users visit the park 10 or more times per month. Those that use the park do so quite often, the mean obtained is 9.1 visits per month. Time spend in the park is also interestingly high, with a mean of 1.83 hours spent in the park and almost 40% of users spending 2 hours or more inside the park.

Table 10
Q1. How often do you visit the park?

	Count	Percent
Few times a year	75	56
First time	59	44
Total	134	100

Table 12
Visits/month

	Frequency	Percent	Mean
1 to 9	106	60.4	9.10
10 to 30	91	39.6	

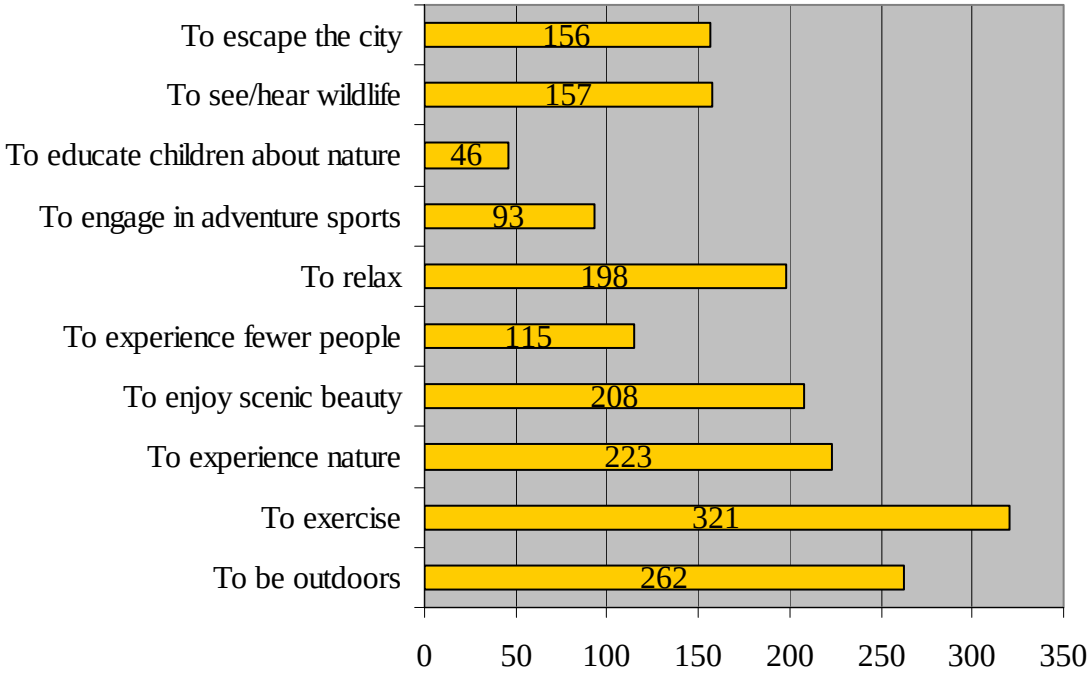
Table 11
Q2. How long did/will you spend on the park today (hours)

Hours	Count	Percent	Mean
0.1	1	0.3	1.83
0.3	3	0.8	
0.3	1	0.3	
0.5	46	12.8	
0.7	1	0.3	
0.8	15	4.2	
1	112	31.3	
1.3	1	0.3	
1.3	1	0.3	
1.5	45	12.6	
2	74	20.7	
2.5	10	2.8	
3	29	8.1	
3.5	2	0.6	
4	10	2.8	
4.5 >	7	2.1	
Total	358	100	

Activities

Most visitors claimed they had visited the park to exercise and to be outdoors. A majority (85%) of visitors who went to the park to exercise went hiking, less than 30% went either jogging or biking. Nature and solitude are two other park magnets. More than 60% of the users went there to be outdoors and experience nature, and almost 30% were there to escape the city and/or experience fewer people. Moreover, a large percentage also visited the park to relax. It is therefore important to analyze, as we do in question 19, how users interact and what kind of coping mechanisms they are using. Finally, wildlife is also an important reason for choosing the park, around 30% of the visitors attend the park to see or hear wildlife.

Figure 1
Q3. Why did you choose to visit the park?



Tables 13a to 13c below show how age influences the reasons why visitors go to the park. Neither “being outdoors” nor “experiencing nature” are important a reason for visiting the park for the youngest and oldest in the survey (table 13a). As table 13c shows, “practicing sports” as a reason for visiting the park decreases with age, starting at 42% in the youngest group and going all the way to 0% in the oldest one. This could also relate to the perception of “sport” at different age groups. Other factors related to demographics and reasons for visiting the park will be highlighted below.

Table 13a
Question 3, being outdoor as reason for visiting the park and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Q3_OUTDO	No	Count	21	25	37	14	8	105
		% within Age	38.2%	22.7%	29.1%	28.0%	88.9%	29.9%
	Yes	Count	34	85	90	36	1	246
		% within Age	61.8%	77.3%	70.9%	72.0%	11.1%	70.1%
Total		Count	55	110	127	50	9	351
		% within Age		100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.558(a)	4	.001
Likelihood Ratio	18.438	4	.001
Linear-by-Linear Association	.974	1	.324
N of Valid Cases	351		

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.62.

Table 13b
Question 3, experiencing nature as reason for visiting the park and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Q3_NATU	No	Count	27	48	43	15	8	141
		% within Age	49.1%	43.6%	33.9%	29.4%	88.9%	40.1%
	Yes	Count	28	62	84	36	1	211
		% within Age	50.9%	56.4%	66.1%	70.6%	11.1%	59.9%
Total		Count	55	110	127	51	9	352
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.833(a)	4	.003
Likelihood Ratio	16.375	4	.003
Linear-by-Linear Association	1.303	1	.254
N of Valid Cases	352		

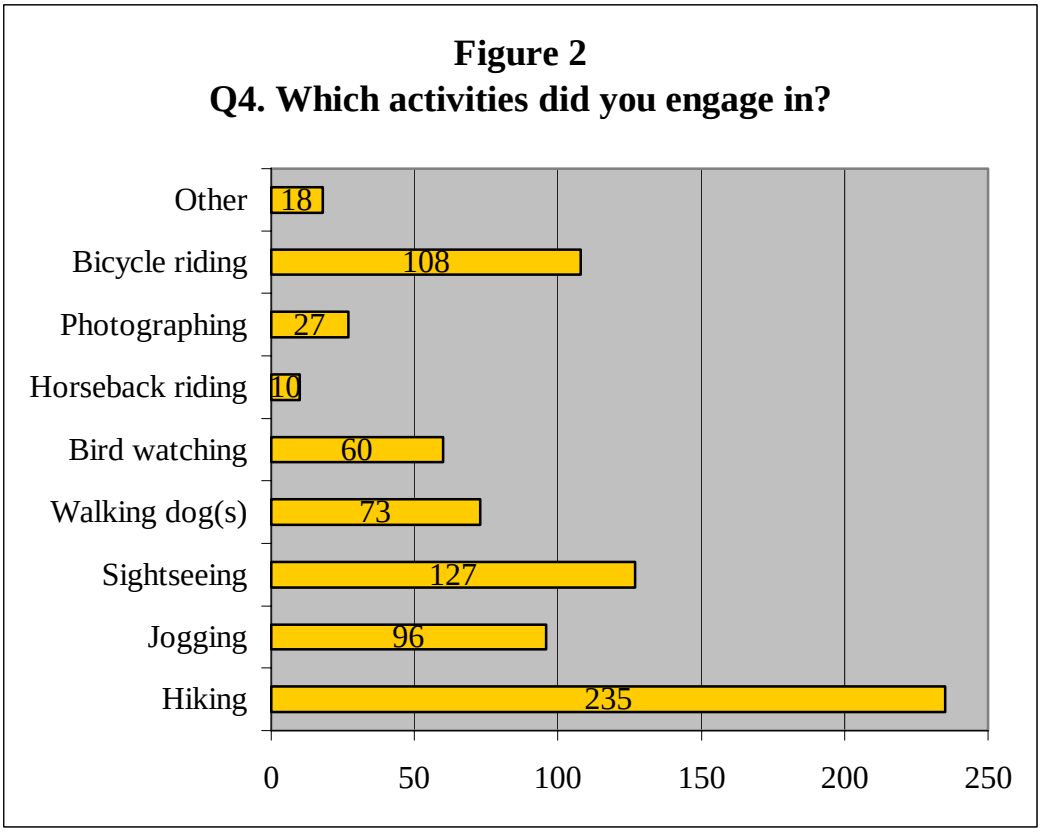
a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.62.

Table 13c Question 3, practicing sports as reason for visiting the park and Age								
			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Q3_SPORT	No	Count	31	74	100	47	9	261
		% within Age	57.4%	67.3%	78.7%	92.2%	100.0%	74.4%
	Yes	Count	23	36	27	4	0	90
		% within Age	42.6%	32.7%	21.3%	7.8%	.0%	25.6%
Total		Count	54	110	127	51	9	351
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.891(a)	4	.000
Likelihood Ratio	27.409	4	.000
Linear-by-Linear Association	23.680	1	.000
N of Valid Cases	351		

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.62.

In terms of activities, 65% of park users are engaged in hiking, while around 25% of park users are engaged in either jogging or mountain biking. Other popular activities, listed in order of user numbers, are sightseeing, dog walking and bird watching (Figure 2).



Tables 14a and 14b show how age has some influences on at least two type of activities performed at the park. Dog walkers tend to be older and bikers tend to be younger. Interestingly, as we shall see below, these two activities are the ones less well regarded by park users due to several reasons. As was the case with question 3, more information related to this question will be provided in the demographic and trail entrances sections.

Table 14a
Question 4, walking dog as activity while in park and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Q3_WALK DOG	No	Count	47	93	101	41	3	285
		% within Age	85.5%	84.5%	79.5%	80.4%	33.3%	81.0%
	Yes	Count	8	17	26	10	6	67
		% within Age	14.5%	15.5%	20.5%	19.6%	66.7%	19.0%
Total		Count	55	110	127	51	9	352
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.065(a)	4	.005
Likelihood Ratio	11.627	4	.020
Linear-by-Linear Association	5.782	1	.016
N of Valid Cases	352		

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.62.

Table 14b
Question 4, biking as reason for visiting the park and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Q3_BIKE	No	Count	37	67	91	42	9	246
		% within Age	67.3%	60.9%	72.2%	82.4%	100.0%	70.1%
	Yes	Count	18	43	35	9	0	105
		% within Age	32.7%	39.1%	27.8%	17.6%	.0%	29.9%
Total		Count	54	55	110	126	51	9
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.402(a)	4	.015
Likelihood Ratio	15.134	4	.004
Linear-by-Linear Association	8.329	1	.004
N of Valid Cases	351		

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.62.

Trail preferences and uses

In terms of trail preferences, more than 60% of visitors use the trail always or most of the time. In many cases (around 40%) this is due to convenient access to the trailhead. Other important reasons for choosing the trailheads are scenery and trail length (around 45%), naturalness, solitude, and width of trail (25%). Width of trail as a reason for choosing the trailhead is related to survey site. As table 15 shows, those who visit Powder Canyon and Turnbull Canyon tend to give more importance to width of trail. This information is neither confirmed nor denied by the results of the picture set analysis. Given that these trailheads experience the highest numbers of horseback riders and mountain bikers, it is likely that they prefer wider trails for their activities. Information on type of trail is complemented in responses to question 11 below.

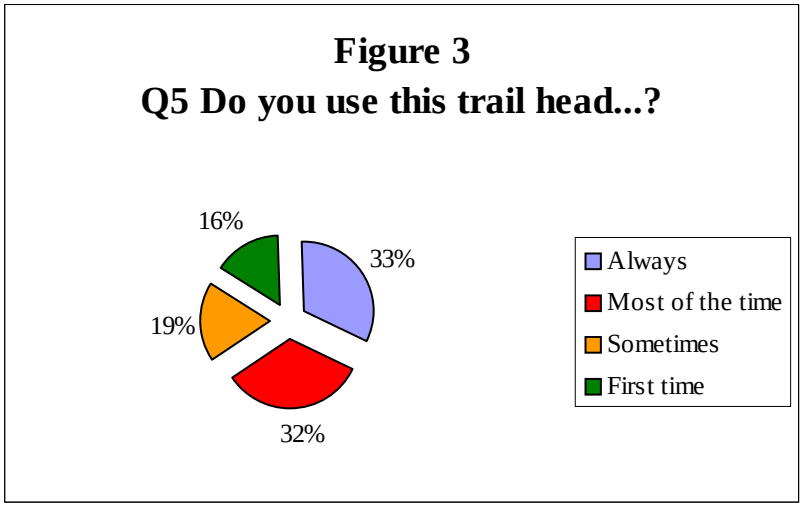


Table 15
Width of trail as factor for trail preference and survey site

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Width	No	Count	24	78	59	64	46	271
		% of site	64.9%	62.4%	85.5%	79.0%	86.8%	74.2%
	Yes	Count	13	47	10	17	7	94
		% of site	35.1%	37.6%	14.5%	21.0%	13.2%	25.8%
Total		Count	37	125	69	81	53	365
		% of site	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

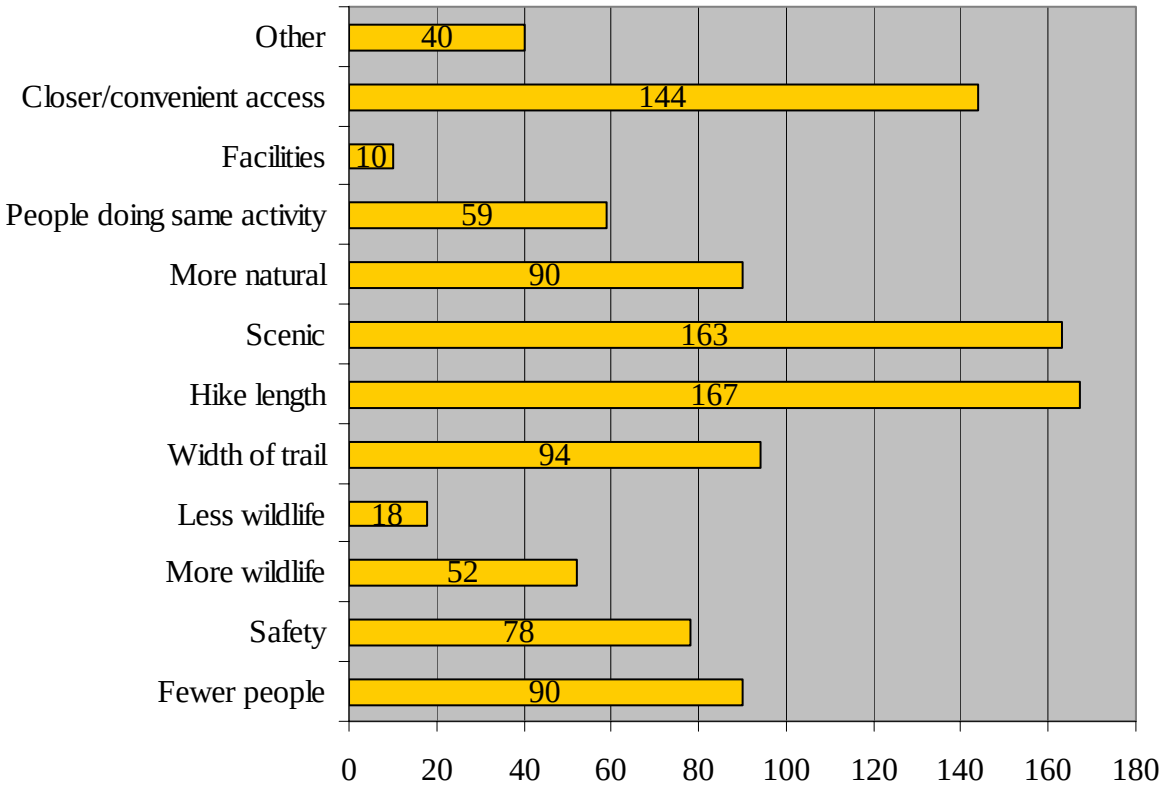
Chi square

	Value	df	Significance (bilateral)
Pearson Chi square	20.778(a)	4	.000
N of valid cases	365		

a 0 cells (.0%) have an expected frequency less than 5. Minimum expected frequency is 9.53.

Another important point regarding trail preferences is that very few respondents (less than 3%) consider facilities as a determining factor when choosing trailheads. This is consistent throughout the trailheads, with only Powder Canyon having a higher (8%), but not statistically significant, preference. In the case of Powder Canyon this could be related to the existence of facilities for horseback riding.

Figure 4
Q8. Why did you choose that route/trail?



Trail use maps and opposition to closure[1]

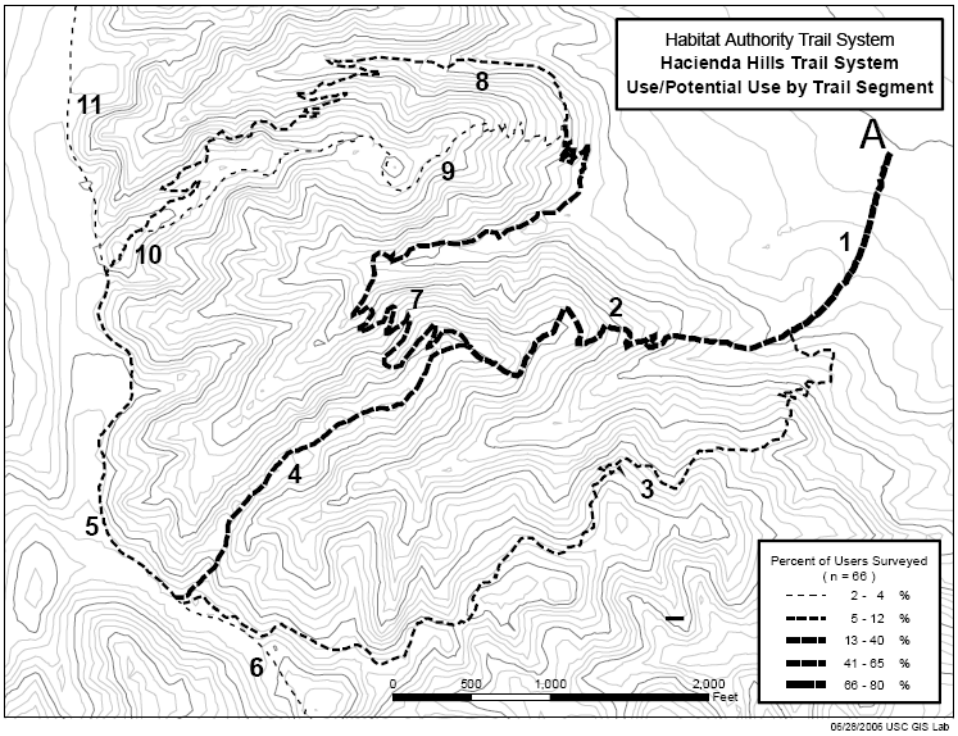
Topographic maps with park trails were included in the survey and every user interviewed was asked to show the route they intended to use or they had use in this visit, plus which trails' closure they would oppose. The maps included below show the percentage of users that use each trail segment. Some of the trips were "round trips" but only accounted as one, so the percentage is per user not per transit. This is an important distinction to consider if results are being considered for conservation management that includes disturbance to native species. For a bird

[1] Maps were developed by Gregory Elwood at the USC GIS Lab.

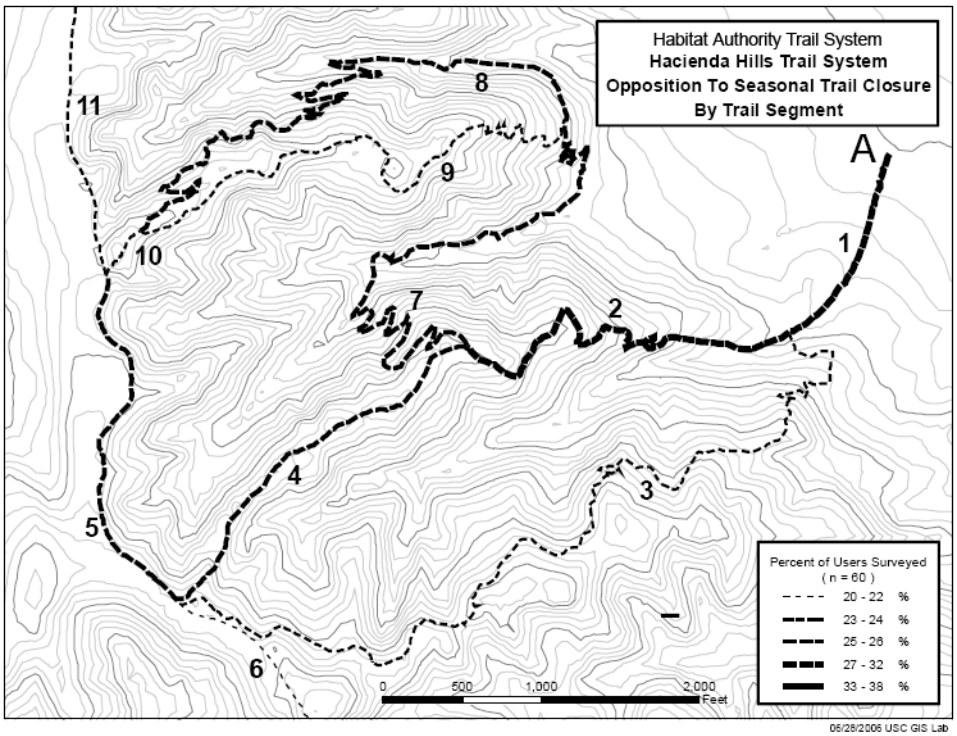
being disturbed by a hiker, for example, it does not make a difference if one person walks twice or two persons walk once through the area. Finally, although rare, some of the trips started in one trail map and finished in another one, this happened mainly with bikers.

The trail segments are symbolized to reflect the survey results. A thicker, bolder line represents a greater percentage of positive user response to the two questions (“Yes, I am using/going to use the trail segment” and “Yes I am opposed to seasonal closure of the trail segment”).

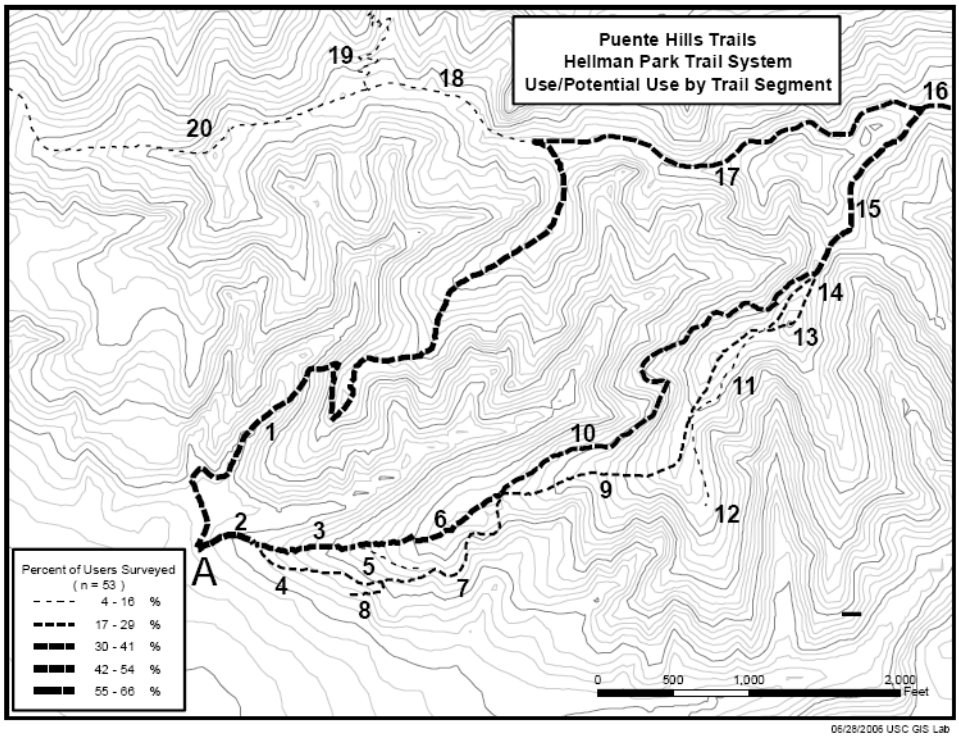
The statistical classification of the response numbers is not the same across the entire series of maps – in order to avoid having all thin lines and only one bold line, or vice-versa. The classification breaks were set to optimize the range of symbols appearing in each map. These maps are intended to show use and opposition to closure for each of the five survey areas individually.



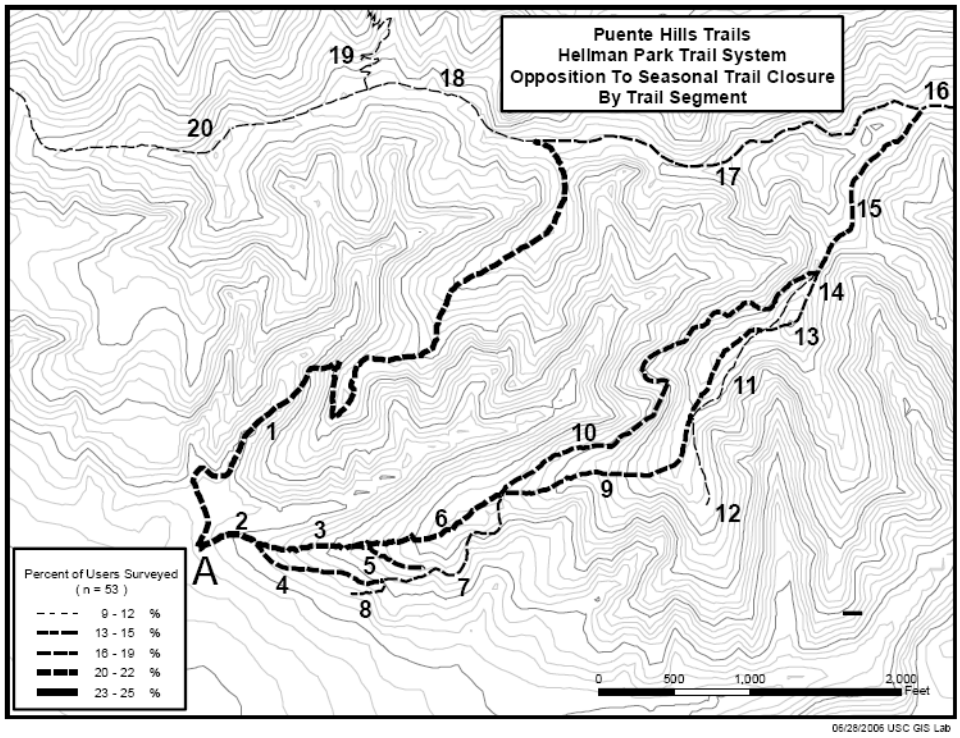
Map 1. Hacienda Hills Trail Use



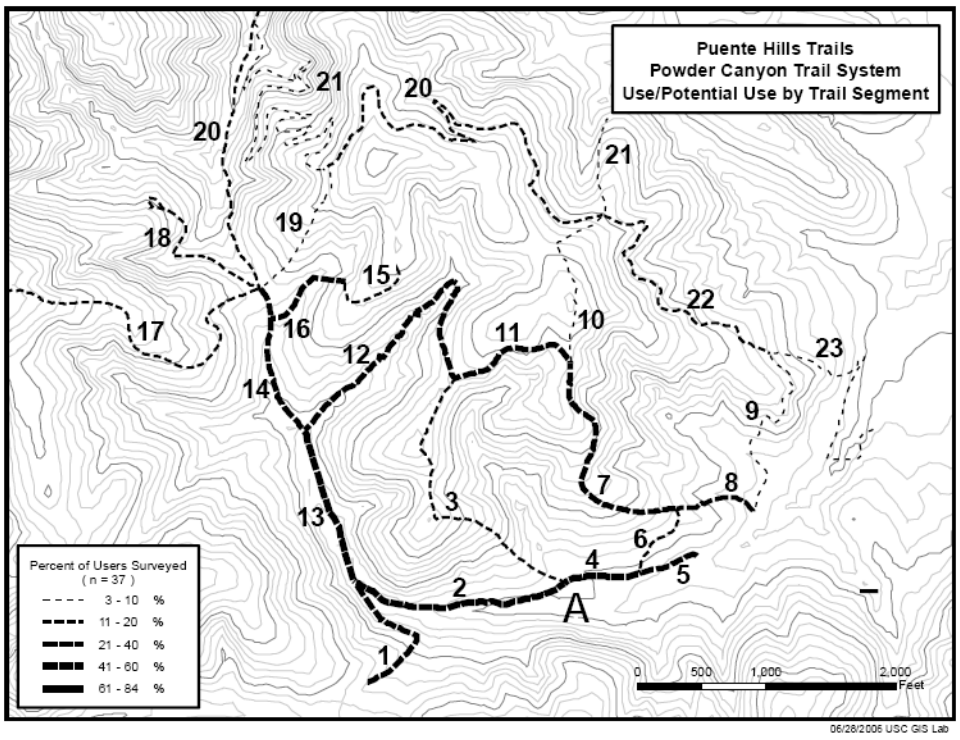
Map 2. Hacienda Hills Trail Opposition to Closure



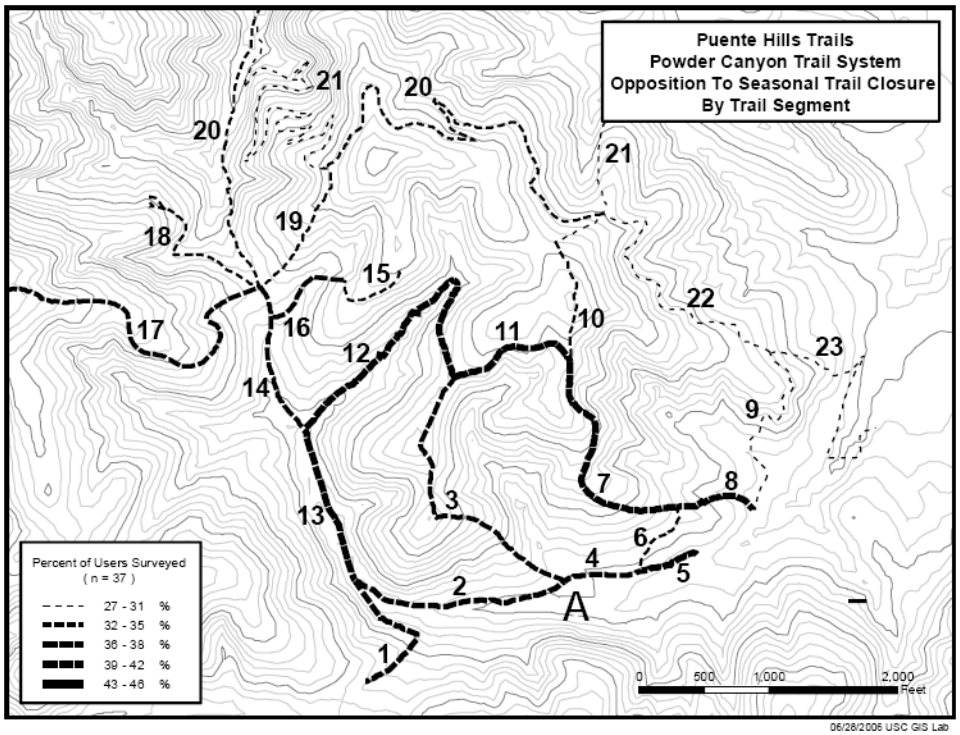
Map 3. Hellman Park Trail Use



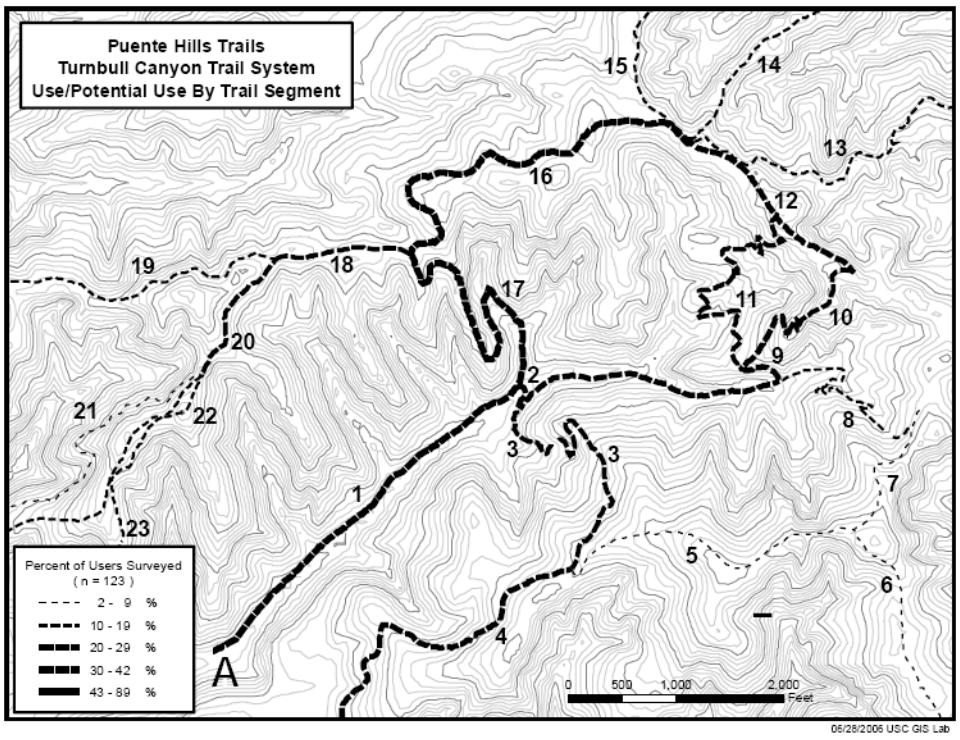
Map 4. Hellman Park Trail Opposition to Closure



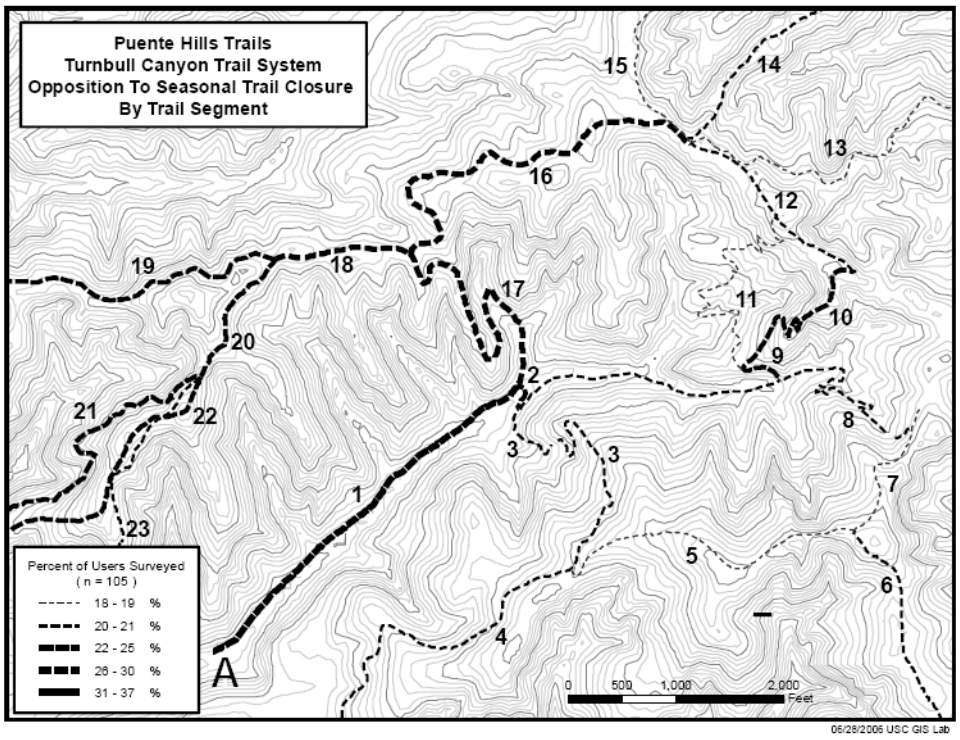
Map 5. Powder Canyon Trail Use



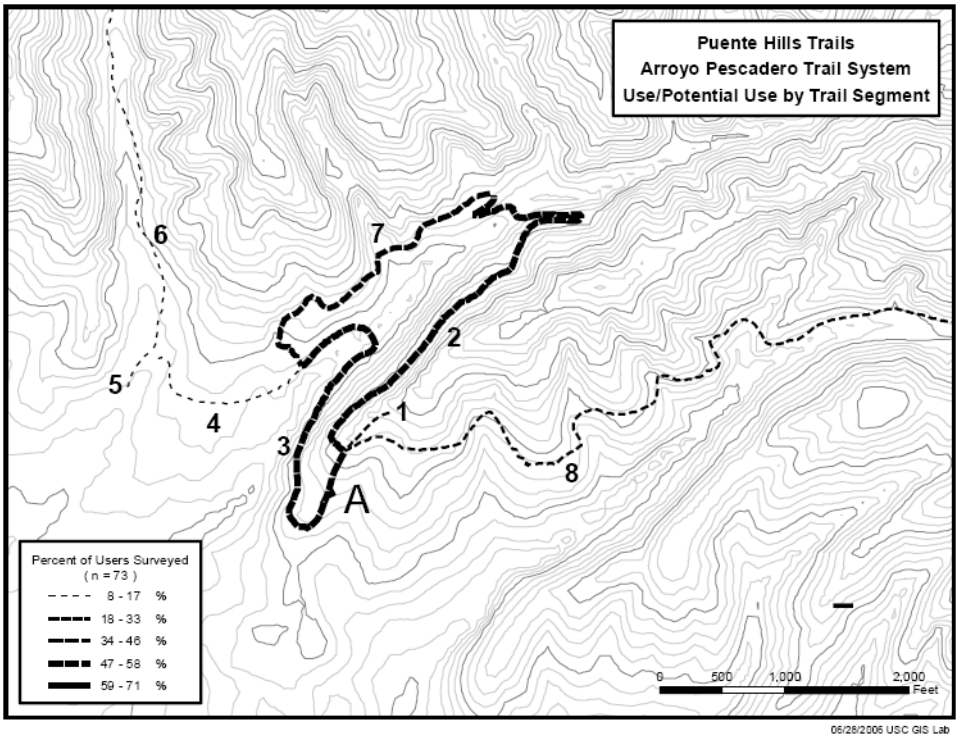
Map 6. Powder Canyon Trail Opposition to Closure



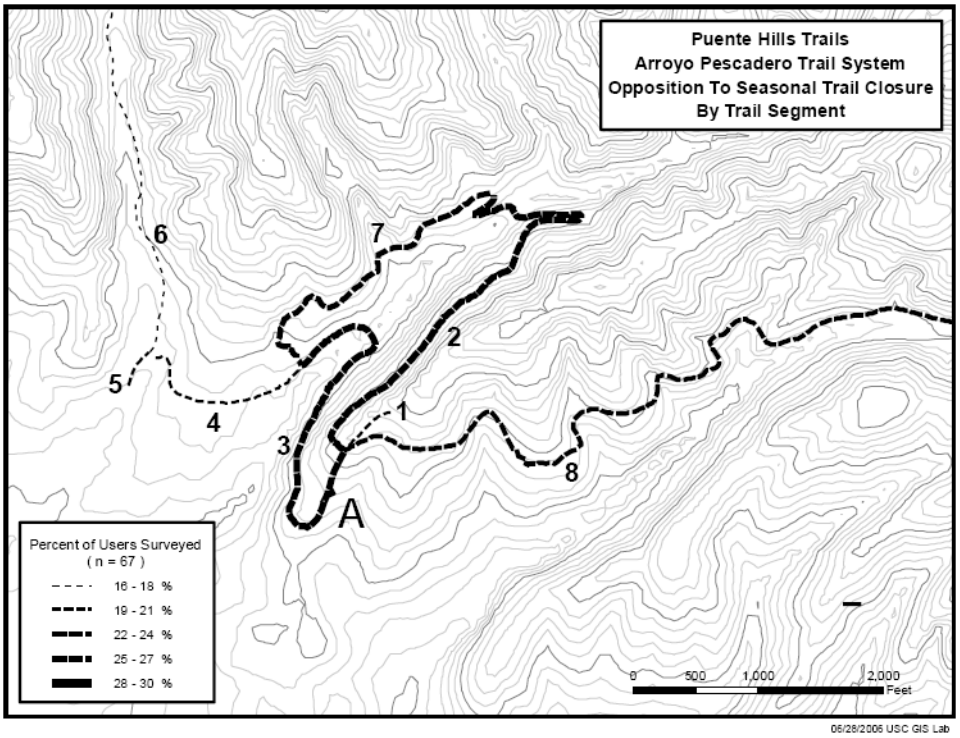
Map 7. Turnbull Canyon Trail Use



Map 8. Turnbull Canyon Trail Opposition to Closure



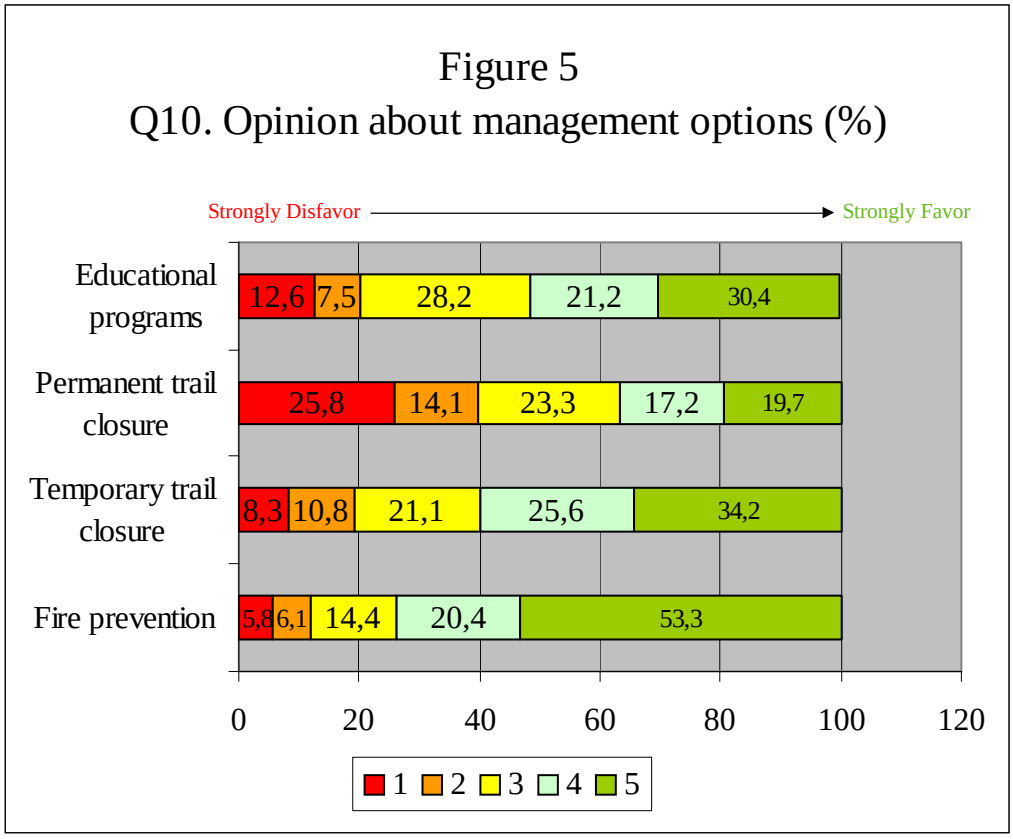
Map 9. Arroyo Pescadero Trail Use



Map 10. Arroyo Pescadero Trail Opposition to Closure

Management options

Information regarding 4 different management options was collected with the surveys. Due to the heavy recreational use and the high number of trails existing in the park, trail management is one of the most delicate issues. During the administration of the survey, question 7, related to opposition to closure of particular trails, was the one that sparkled more questions from interviewees. When considering trail management options, both permanent and temporary closures are possible depending on the objective of the closure. Temporary closure can be used to protect certain breeding habitat in certain seasons, but permanent closure is sometimes necessary to protect particularly sensitive species. As Figure 5 shows, there is a relatively high opposition to permanently closing trails, and relative support to temporary closure to restore native vegetation or protect wildlife. Support for temporary closures can turn to opposition if the trails are closed permanently. In terms of activities, those that go to the park to hike, sightsee and bird-watch have a more favorable position towards both temporary and permanent closure. Support for permanent closure is lower for all activities, except for bird-watchers which still show a relatively high support for permanent closures for conservation. Finally, table 16 shows that users of one particular trailhead (Turnbull Canyon) particularly disfavor management that includes permanent trail closures.



While educational programs such as ranger lead hikes receive a moderate support, fire prevention mechanisms such as clearing vegetation receive a very high support (Figure 5). Interest on ranger hikes is quite low. Results from question 17 show that a low percentage of

Table 16
Permanent trail closure acceptance per trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q10_B	1	% of trailhead	5.4%	13.5%	4.5%	5.1%	7.7%	8.3%
	2	% of trailhead	10.8%	15.1%	6.1%	11.4%	5.8%	10.8%
	3	% of trailhead	27.0%	23.8%	13.6%	15.2%	28.8%	21.1%
	4	% of trailhead	18.9%	23.8%	27.3%	32.9%	21.2%	25.6%
	5	% of trailhead	37.8%	23.8%	48.5%	35.4%	36.5%	34.2%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi square	28.015(a)	16	.031
Likelihood Ratio	28.245	16	.030
Linear-by-Linear Association	4.119	1	.042
N of Valid Cases	360		

a 3 cells (12.0%) have an expected count less than 5. The minimum expected count is 3.08.

Table 17
Level of education and information obtained from rangers

			Education					Total
			High school student	No high school diploma or GED	High school graduate or GED	College or University Student	University Graduate	
Ranger	No	Count	14	14	47	111	93	279
		% of education	66.7%	63.6%	85.5%	87.4%	79.5%	81.6%
	Yes	Count	7	8	8	16	24	63
		% of education	33.3%	36.4%	14.5%	12.6%	20.5%	18.4%
Total		Count	21	22	55	127	117	342
		% of education	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.576(a)	4	.021
Likelihood Ratio	10.639	4	.031
Linear-by-Linear Association	2.419	1	.120
N of Valid Cases	342		

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.87

Table 18
Acceptance of education ranger lead hikes and survey site

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q10_C	1	% of trailhead	13.5%	17.5%	6.2%	11.4%	9.8%	12.6%
	2	% of trailhead	.0%	9.5%	6.2%	8.9%	7.8%	7.5%
	3	% of trailhead	51.4%	27.8%	23.1%	22.8%	27.5%	28.2%
	4	% of trailhead	10.8%	16.7%	21.5%	32.9%	21.6%	21.2%
	5	% of trailhead	24.3%	28.6%	43.1%	24.1%	33.3%	30.4%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi square	30.644(a)	16	.015
Likelihood Ratio	31.868	16	.010
Linear-by-Linear Association	2.481	1	.115
N of Valid Cases	358		

a 4 cells (16.0%) have an expected count less than 5. The minimum expected count is 2.79.

users actually get information from rangers, and as table 17 shows, those that do get information from rangers are either in high school or have no high school diploma. Table 18 shows there is a relation between acceptance of ranger lead educational hikes and trailheads. The trailheads that show higher support for such programs are Hellman Park, Arroyo Pescadero and Hacienda Hills Trailhead. Another interesting crosstab is the relationship between support to ranger hikes and perception of wildlife as dangerous. There is a higher tendency to support ranger lead hikes among those who perceive wildlife as dangerous. The interest on these hikes might be sparkled more from a need of perceived safety while in the park than from an interest in learning more about the park.

More trail information

As described in the methodology section, three sets of pictures were put together in order to analyze particular trail preferences among users. Set A had wide trails with almost no vegetation, set B had relatively narrow trails with vegetation, and set C had relatively wide trails with vegetation of different types. Interviewees were asked to individually rate the sets of trails from 1 to 5. Results are presented in Figure 6 and show a stronger preference for sets B and C, both of which include vegetation cover of various degrees. Although a quarter of park users mention trail width as a factor when choosing trails, it appears that vegetation cover, in particular the existence of bushes and trees have a greater influence in trail preference. It should be noted that users were asked to rate the set of trails they liked the most, scenic beauty value might be different than use value, that is, users might consider some trails nicer to watch, but would rather use a different one. In general, trail width does not seem to be considered as important as vegetation cover.

Figure 6
Q11. Opinion about the photo sets of trails (percentage)

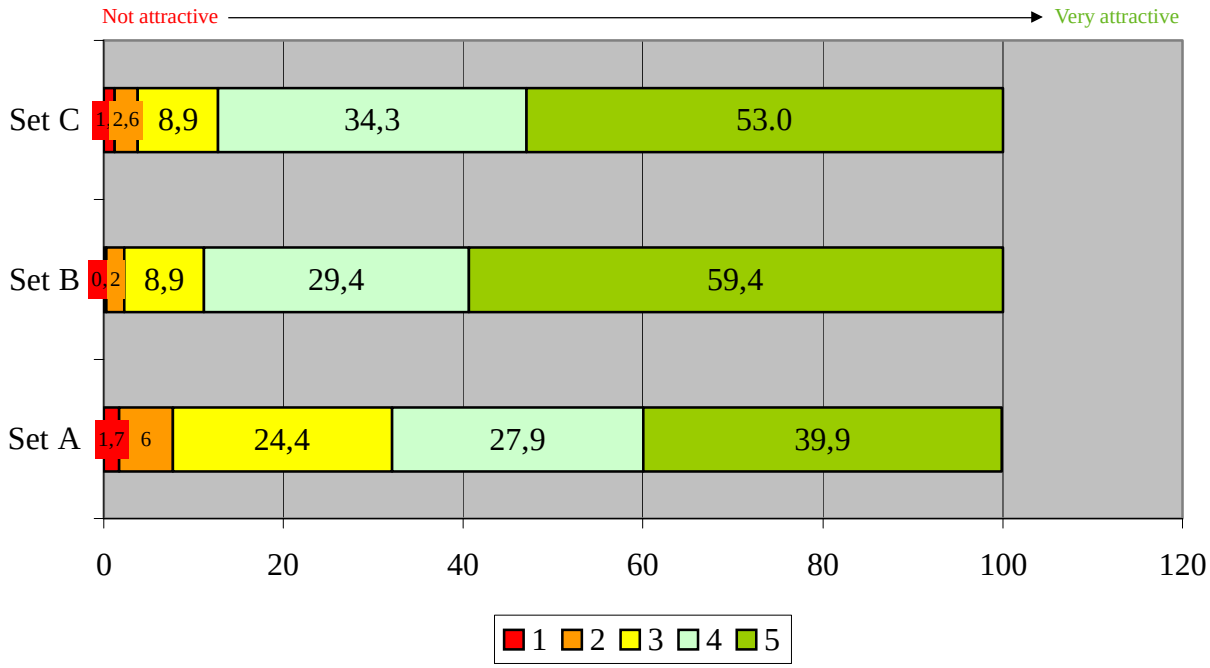
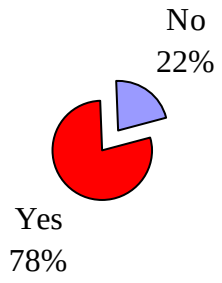


Figure 7
Q12. Do you know the park rules?



Park rules

Almost 80% of park users claim to know park rules. Although it is a high percentage, it is expected that many users would not like to confess they do not know the rules or are unaware of the existence of park rules. Table 19 shows that Powder Canyon users appear to be the most knowledgeable of park rules with almost 95%. Table 20 shows that university students or graduates are the least knowledgeable of park rules – or the most open to admit so.

Table 19
Rules knowledge per entrance

	Arroyo Pescadero	Hacienda Hills Trailhead	Hellman Park	Powder Canyon	Turnbull Canyon
Responded yes to question on rules knowledge	70.8%	76.2%	76.1%	94.4%	78.4%

Table 20
Knowledge of park rules and education

			Education					Total
			High school student	No high school diploma or GED	High school graduate or GED	College or University Student	University Graduate	
Rules	No	Count	5	5	16	28	15	69
		% of education	22.7%	23.8%	32.0%	24.3%	14.0%	21.9%
	Yes	Count	16	16	34	87	92	245
		% of education	72.7%	76.2%	68.0%	75.7%	86.0%	77.8%
Total		Count	22	21	50	115	107	315
		% of education	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

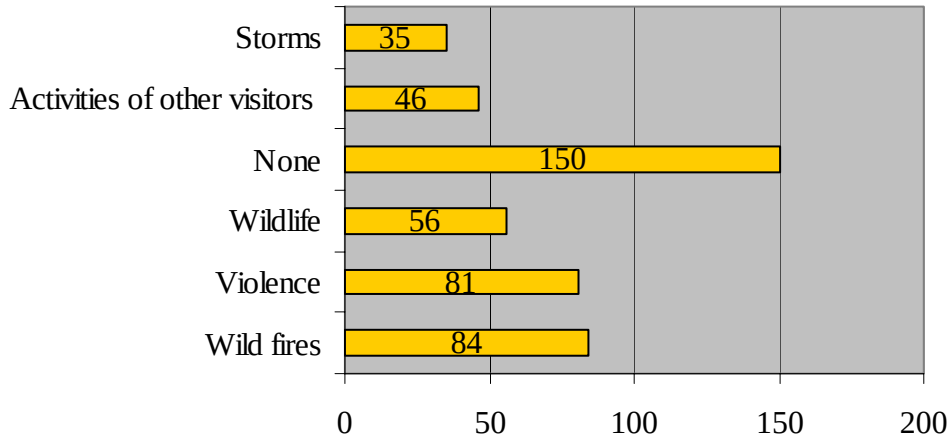
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.723(a)	8	.008
Likelihood Ratio	12.872	8	.116
Linear-by-Linear Association	.453	1	.501
N of Valid Cases	315		

a 7 cells (46.7%) have expected count less than 5. The minimum expected count is .07.

Safety perception inside the park

Question 13 in the survey instrument, presented in Figure 8 below, shows that almost 50% of park users do not feel unsafe at all while being in the park. Things that make users feel unsafe can be equally divided in “natural” and “human” elements. “Wildfires” and “wildlife” on one side, and “activities of other users” and “violence” on the other, make around 30% of users feel unsafe. Despite its relative isolation, or perhaps due to it, Powder Canyon is perceived as the safest for all of the options suggested in question 13. On the other hand, Hacienda Hills Trailhead had the highest percentage of perceived un-safety for all options related to natural hazards – wildfire, wildlife, and storms.

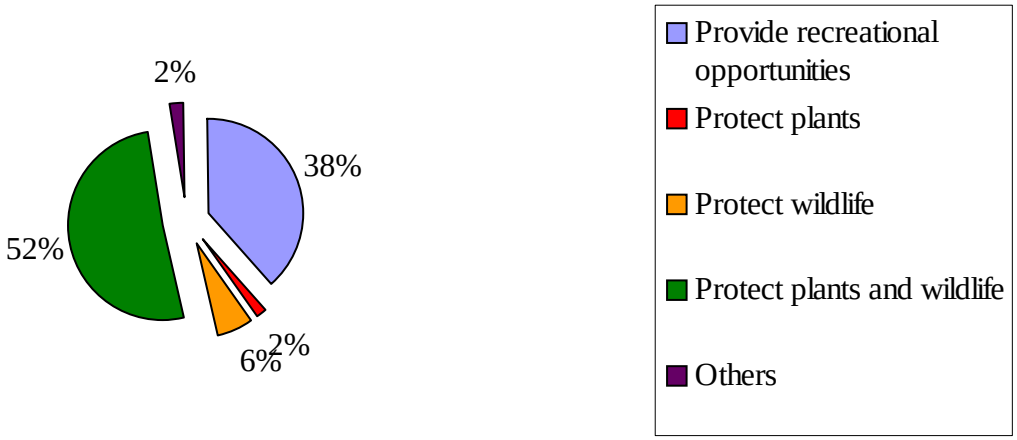
Figure 8
Q13. Do any of the following things make you feel unsafe about being in the park or in the park proximity?



Nature and park: perceptions and management

Questions 14 to 16, presented in Figures 9 to 11 below, were directed towards understanding users' perceptions of nature and of park management. When forced to choose between one option or the other, more than 50% of park users state that protecting plants and wildlife is more important than providing recreational opportunities. The percentage climbs to 60% if we add the options of protecting wildlife and protecting plants individually. Although the numbers are small to infer statistical significance, protection of wildlife is seen as more important than protection of plants on a 3:1 ratio (Figure 9).

Figure 9
Q14. The most important reason to protect the park is...



Results related to what should be the park's objective are reinforced in question 15 (Figure 10), where more than 50% disagree with the statement "recreation should be a higher priority than wildlife conservation in park management", and only 15% agree. Regarding wildlife, although almost a quarter of park users agree that "park wildlife can be dangerous" – and almost 50% disagree – it must be noted that more than 85% state agree that they "enjoy sharing the park with wildlife". It was outside the scope of this study, but it would be interesting to find out what would happen to these percentages if we interviewed people in the park's vicinity, and ask them about sharing the area with wildlife, a necessary fact if they enjoy sharing the park with wildlife that is not aware of the location of park limits. After looking at the results from question 15_d there is some hope that park users are willing to share spaces with wildlife. Only 6% of park users agree with the statement "park wildlife can be a nuisance", and almost 85% disagree with it, with 70% strongly disagreeing. Given the particular relationship neighbors have with wildlife, it would be interesting to find out if that relationship is different between park users and non users.

Figure 10

Q15. Do you agree or disagree with the following statement

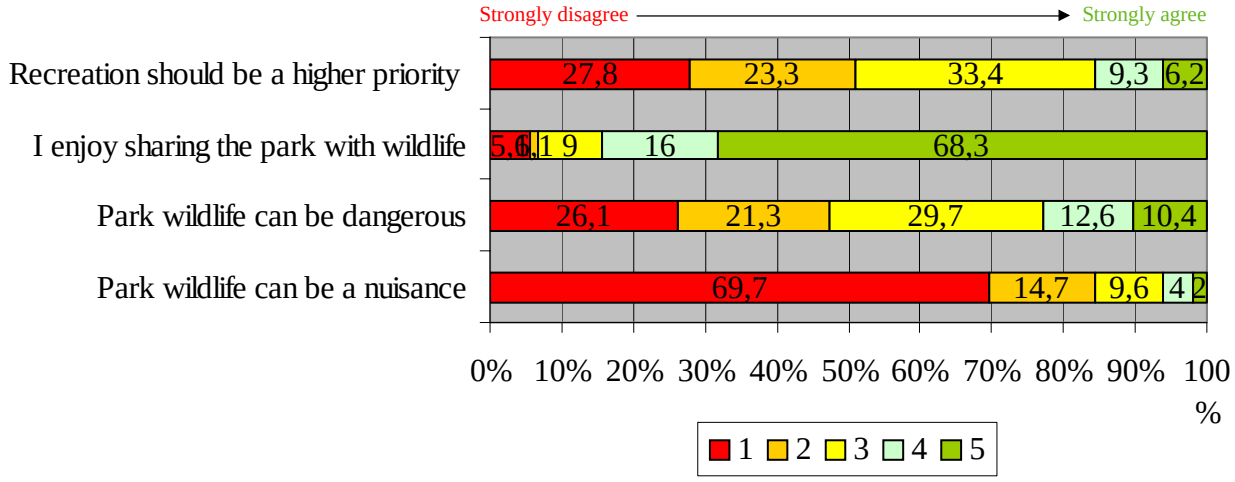
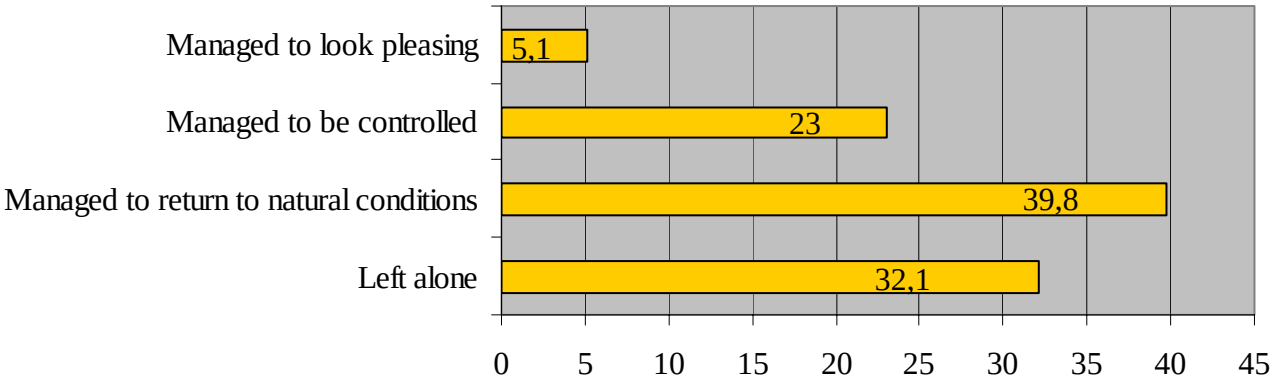


Figure 11

Q16. In your opinion, nature inside the park should be...



Encouraging Figures keep coming when we look at the results from question 16 (Figure 11). More than 70% of park users believe nature in the park should be managed to return to natural conditions, or left alone, which in many ways equals to a type of management conducted to letting “nature” return to “natural conditions”.

Still, almost a quarter of park users consider that the park should be managed to be controlled and only 5% consider it should be managed to look pleasing. Cross tabulation of question 16 with trailheads shows that although all trailheads have the same percentage (around 70%) of agreement with “left alone” and “managed to return to natural conditions”, Hacienda Hills

Trailhead has a higher percentage of users trying to return the park to natural conditions by way of management. It should be noted that chi square test showed no statistical significance for this cross tabulation (pearson chi square 0.324).

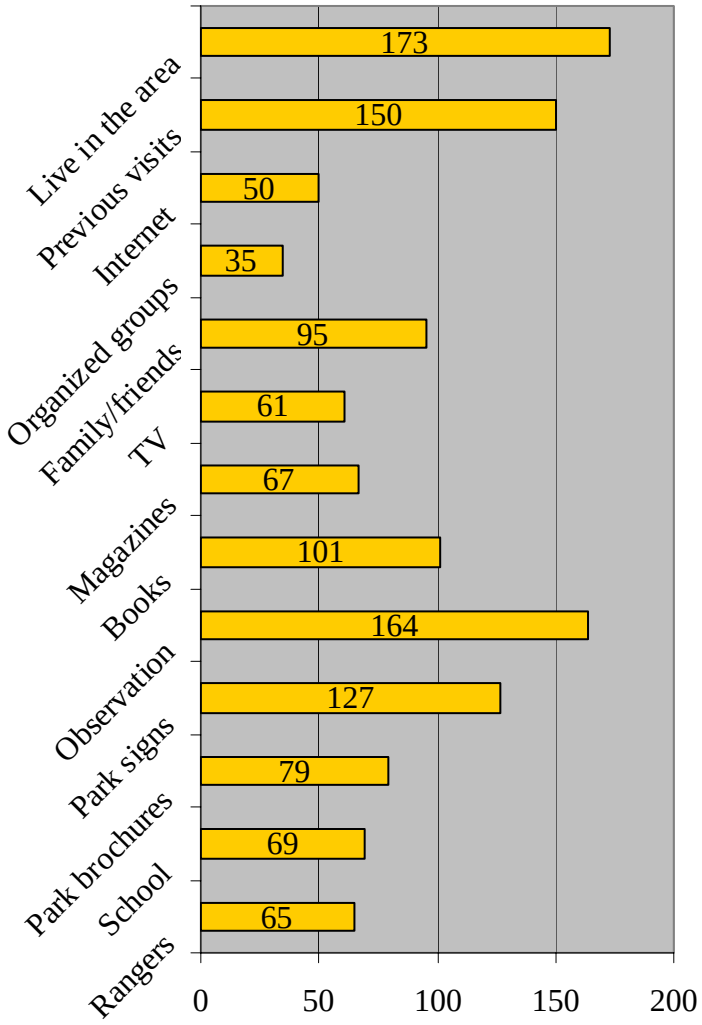
Table 21
Perceptions of park management by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q 16	Left alone	Count	15	44	13	25	16	113
		% of survey site	40.5%	35.5%	19.7%	32.9%	32.7%	32.1%
	Manage to natural conditions	Count	11	40	33	33	23	140
		% of survey site	29.7%	32.3%	50.0%	43.4%	46.9%	39.8%
	Manage to control	Count	10	33	16	15	7	81
		% of survey site	27.0%	26.6%	24.2%	19.7%	14.3%	23.0%
	Manage to please	Count	1	7	4	3	3	18
		% of survey site	2.7%	5.6%	6.1%	3.9%	6.1%	5.1%
Total		Count	37	124	66	76	49	352
% of survey site			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources of knowledge

In question 17 we intended to find out what are the main sources from which park users obtain information about the park and its flora and fauna. This type of information can be a valuable tool for park management. Here we will describe the results from question 17 and analyze them with information from demographic statistics.

Figure 12
Q17. Where does your knowledge of the park and its flora and fauna come from:



The main sources of information come from direct experience, either from the park users or from their peers. Living in the area, observation, and previous visits are, respectively, the three main sources of knowledge. Park signs seem to be the most effective institutional sources of information, brochures, and rangers come after. Printed information in the form of books and magazines are sources of information for 25% and 19% of park users respectively. In table 22 (a to d) we present cross tabulation with demographics that showed significant association with sources of information. Table 22a shows that observation as source of information is related to age, the older the users the more they seem to consider observation as a valuable source of information about the park. Very similar results are obtained when we cross tabulate previous visits (table 22d). Magazines and organized groups are important sources of information only to those 71 + (Tables 22b and 22c).

Table 22a
Observation as source of information and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Observation	Yes	Count	15	44	72	24	7	162
		% within Age	27.8%	41.1%	57.1%	47.1%	77.8%	46.7%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.121(a)	4	.001

Table 22b
Magazines as source of information and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Magazines	Yes	Count	9	17	28	7	5	66
		% within mag.	16.7%	15.9%	22.2%	13.7%	55.6%	19.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.442(a)	4	.034

Table 22c
Organized groups as source of information and Age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Organized group	Yes	Count	4	8	12	6	4	34
		% within org group	7.4%	7.5%	9.5%	11.8%	44.4%	9.8%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.459(a)	4	.009

Table 22d Previous visits as source of information and Age								
			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Previous visits	Yes	Count	16	37	66	23	6	148
		% within prev visits	29.6%	34.6%	52.4%	45.1%	66.7%	42.7%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.717(a)	4	.008

Trail use interactions

In this section we report the results of questions 18 to 21, which were intended to understand interactions between different trail users, perceptions of each other, and possible coping mechanisms already in effect in the park. Those interviewees who responded no to question 18 (Figure 13) did not complete questions 19 to 21. Moreover, not everyone who responded yes to question 18 had an opinion about every other user type, but they at least had an opinion about one user type. Therefore n in this case is low and it limits the statistical significance of chi square tests in cross tabulations between question 19 and other question. A total of 42% stated that the activities of other users affected, positively or negatively, their experience of the park. In Figure 14 we describe how park users describe the impact of other users on their experience. Results are discriminated by type of activity.

Opinions about dog walking and mountain biking where the most frequent. Mountain biking and dog walking, in that order, were also the activities that most negatively affected park users. Hikers are by far the group that most positively affected other users' experience.

The reasons why users reported their experience being negatively affected by other park users are presented in Figure 15. As stated, due to low number of respondents we cannot relate particular problems with particular activities.

Figure 13
Q18. Do the activities or behaviors of other trail users affect your experience at the park?

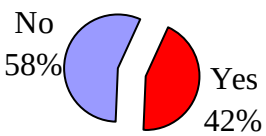


Figure 14
Q19. How these user activities impact you?

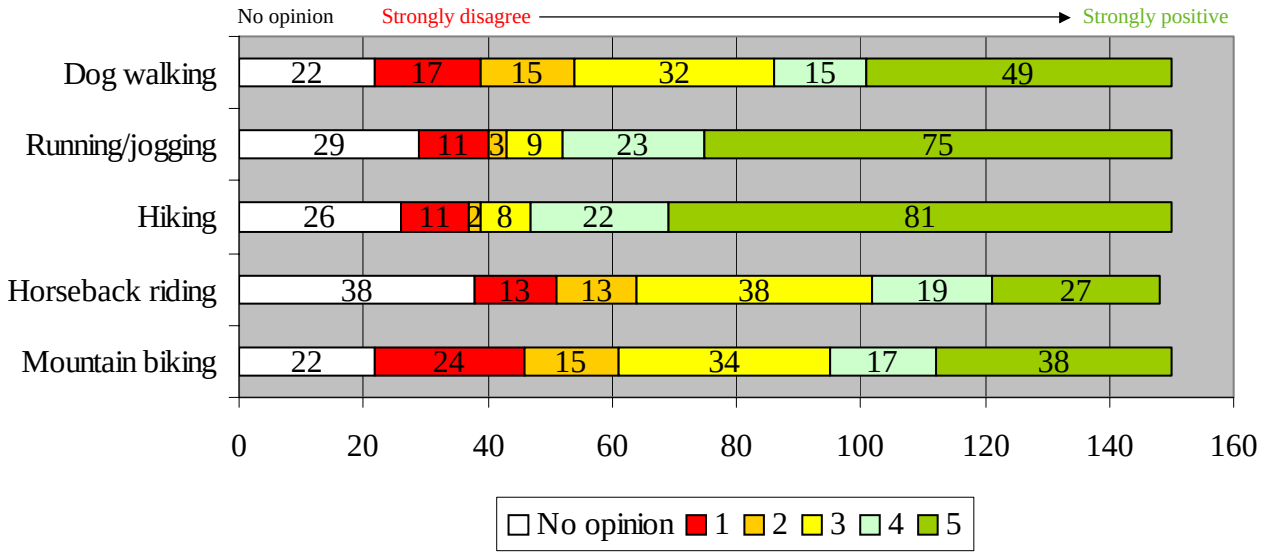
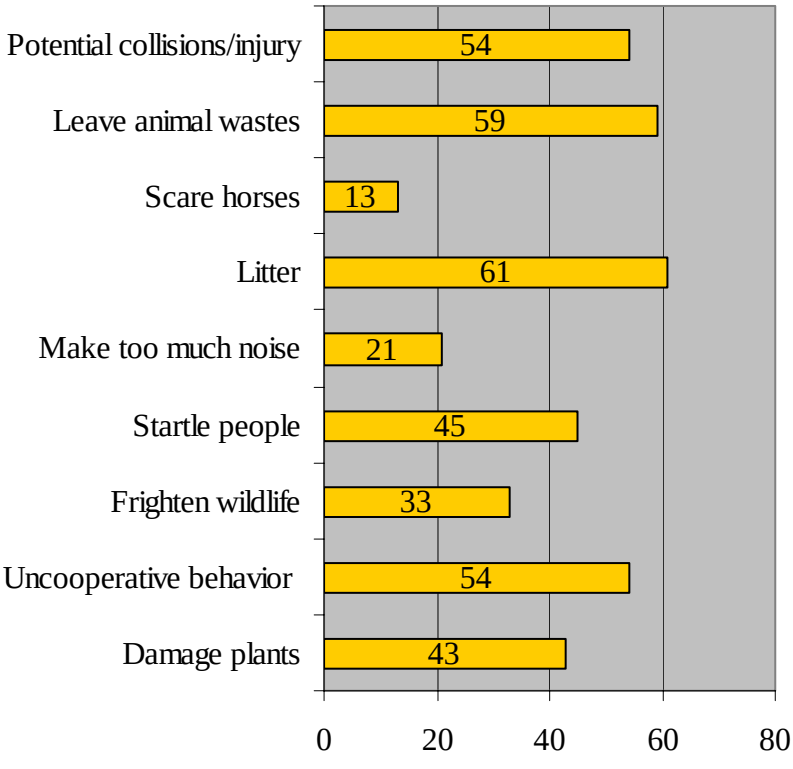


Figure 15
Q20. Why do they present a problem to you?



However, it is likely that “potential collisions” is a cause of friction between other users and mountain bikers and mountain bikers and other users. Following the same reasoning we can expect that “leave animal wastes” is related to dog walking users and scare horses comes from horseback riders. In this last case, 13 responses is significantly high if we consider that 10 users reported visiting the park to participate in horseback riding as an activity (Figure 2). Litter is the major source of complaint towards other users’ activities with uncooperative behavior coming next. In terms of conflicts per trailhead, tables 23 and 24 show significant relations with startle at people and uncooperative behavior.

Table 23
Question 20 and trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q_20 Startle at people	No	Count	12	44	18	20	7	101
		% of trailhead	85.7%	78.6%	64.3%	71.4%	35.0%	69.2%
	Yes	Count	2	12	10	8	13	45
		% of trailhead	14.3%	21.4%	35.7%	28.6%	65.0%	30.8%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi square	15.451(a)	4	.004
Likelihood Ratio	14.784	4	.005
Linear-by-Linear Association	11.223	1	.001
N of Valid Cases	146		

a 1 cells (10.0%) have an expected count less than 5. The minimum expected count is 4.32.

Table 24
Question 20 and trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q_20 Bad behavior	No	Count	11	41	15	16	9	92
		% of trailhead	78.6%	73.2%	53.6%	57.1%	45.0%	63.0%
	Yes	Count	3	15	13	12	11	54
		% of trailhead	21.4%	26.8%	46.4%	42.9%	55.0%	37.0%

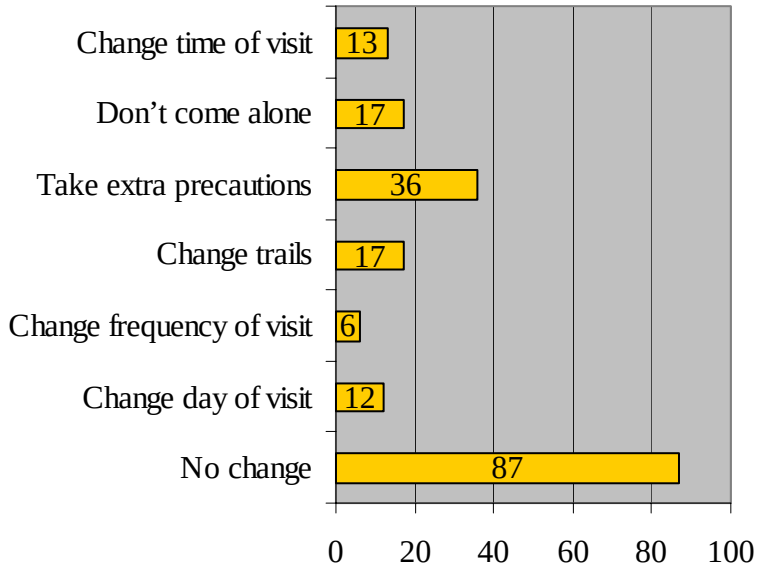
Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi square	8.224(a)	4	.084
Likelihood Ratio	8.319	4	.081
Linear-by-Linear Association	6.988	1	.008
N of Valid Cases	146		

a 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 5.18.

In terms of coping behaviors due to other activities affecting the enjoyment of the park, we found that around 40% of those who answered yes to question 18, or about 15% of park users, have altered the way they use the park due to other users' behavior (Figure 16). The most frequent coping mechanism has been "taking extra precautions", but a few users have reportedly changed the day or time of visits or stopped coming alone.

Figure 16
Q21. In order to avoid any of the trail users mentioned above, have you altered your use of the park?



Transportation

Transportation to trailheads usually is not done from great distances. In all trailheads but Turnbull Canyon 4 or 5 zip codes provided by users are local and amount to more than 65% of the traffic. However, transportation is still mostly by private vehicle, mainly car (75%). Almost 10% travel to the park by bicycle and 14% walk or jog to the park. It is interesting to note that there is a strong relation between trailhead and type of transportation used to get to the park. As table 25 shows, most of those that walk or jog to the park use either Hacienda Hills Trailhead (46% of that trailhead users), or Hellman Park, and almost 80% of those that bike to the park use Turnbull Canyon as a trailhead, compromising 23% of Turnbull Canyon users. As expected, only Powder Canyon receives users that travel by horse.

Figure 17
Q22. How did you travel to the park today?

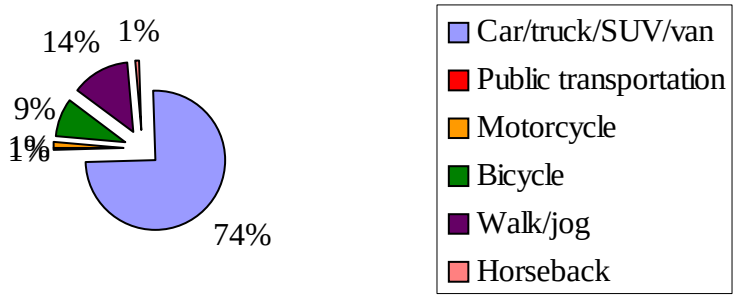


Table 25
Means of transportation to the park by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q_22	Car/truck SUV/van	Count	34	88	33	76	35	266
		% of trailhead	91.9%	71.0%	49.3%	96.2%	68.6%	74.3%
	Pulic trans-portation	Count	0	0	0	0	2	2
		% of trailhead	.0%	.0%	.0%	.0%	3.9%	.6%
	Motorcycle	Count	0	0	3	0	1	4
		% of trailhead	.0%	.0%	4.5%	.0%	2.0%	1.1%
	Bicycle	Count	0	28	0	1	4	33
		% of trailhead	.0%	22.6%	.0%	1.3%	7.8%	9.2%
	Walk/jog	Count	0	8	31	2	9	50
		% of trailhead	.0%	6.5%	46.3%	2.5%	17.6%	14.0%
	Horseback	Count	3	0	0	0	0	3
		% of trailhead	8.1%	.0%	.0%	.0%	.0%	.8%
Total		Count	37	124	67	79	51	358
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	167.807(a)	20	.000
Likelihood Ratio	147.999	20	.000
Linear-by-Linear Association	.222	1	.637
N of Valid Cases	358		

a 7 cells (46.7%) have expected count less than 5. The minimum expected count is .07.

Demographics

In this section we present demographic data from questions 25 to 33. We first introduce descriptive statistics for each question and then describe with cross tabulation some of the other variables from the survey we have found that are related to demographic variables.

Age

In Figure 18 we present age data from question 25. From a comparison with table 26 we can conclude that besides an overrepresentation of age group 41-55, we where able to capture adequate numbers of surveys from each group age. In order to obtain more reliable information from the group age 71+ we should had performed a stratified sample. Following we present cross tabulations between age and other variables that have been found related to this variable.

Figure 18
Q25. Age

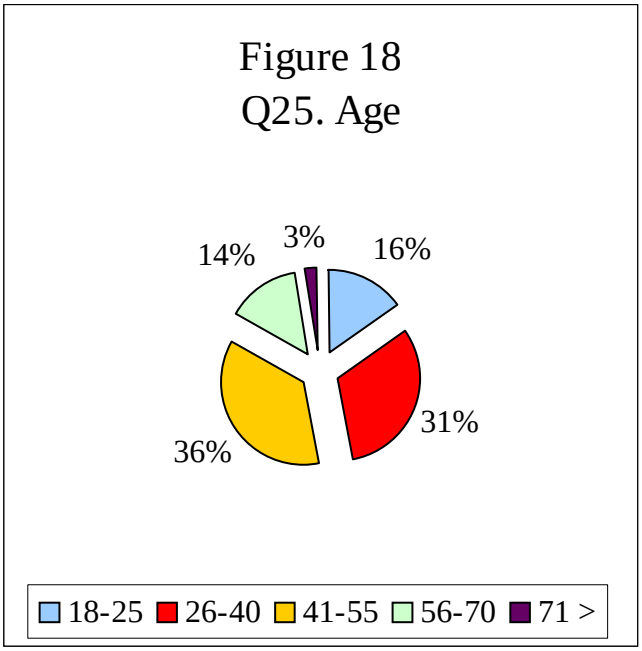


Table 26
User count – Age results

Age	Count	%
18-25	176	19.28
26-40	268	29.35
41-55	194	21.25
56-70	110	12.05
71+	10	1.10

Table 27 shows that selection of trail based on safety progressively goes up with, reaching a peak of 50% for users age 71+. Safety, as we shall see in the gender section is also an important factor at the time of weighting safety into trail selection.

Table 28 below shows a similar tendency as table 27. The older the users the greater chances they will choose a trail due to the scenic beauty of it.

Table 27
Security as reason to choose trail and age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Safety	No	Count	45	94	96	38	4	277
		% within Age	83.3%	87.0%	76.2%	74.5%	50.0%	79.8%
	Yes	Count	9	14	30	13	4	70
		% within Age	16.7%	13.0%	23.8%	25.5%	50.0%	20.2%
Total		Count	54	108	126	51	8	347
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.248(a)	4	.036
Likelihood Ratio	9.661	4	.047
Linear-by-Linear Association	6.556	1	.010
N of Valid Cases	347		

a 1 cells (10.0%) have expected count less than 5. The minimum expected count is 1.61.

Table 28
Scenic trail as reason to choose trail and age

			Age					Total
			18 a 25	26 a 40	41 a 55	56 a 70	71+	
Scenic	No	Count	33	66	71	19	1	190
		% within Age	61.1%	61.1%	56.3%	37.3%	12.5%	54.8%
	Yes	Count	21	42	55	32	7	157
		% within Age	38.9%	38.9%	43.7%	62.7%	87.5%	45.2%
Total		Count	54	54	108	126	51	8
		% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.841(a)	4	.005
Likelihood Ratio	15.374	4	.004
Linear-by-Linear Association	10.152	1	.001
N of Valid Cases	347		

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.62.

Gender

There is a large gender imbalance in use of the park, 70% of park visitors are males and only 30% females (Figure 19). Although it is unlikely the data will show the reasons behind this gender disparity – it is out of its scope – gender is one of the variables that relates to most other non-demographic variables. Information on this regard is presented on tables 29a to 33.

Figure 19
Q26. Gender

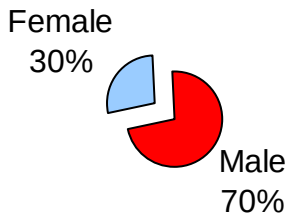


Table 29a Perceptions of park management by gender					
			Gender		Total
			Male	Female	
Q 16	Left alone	Count	91	21	112
		% within gender	37.0%	20.6%	32.2%
	Manage to natural conditions	Count	82	55	137
		% within gender	33.3%	53.9%	39.4%
	Manage to control	Count	59	22	81
		% within gender	24.0%	21.6%	23.3%
	Manage to please	Count	14	4	18
		% within gender	5.7%	3.9%	5.2%
Total		Count	37	246	102
		% of gender	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.409(a)	3	.002
Likelihood Ratio	14.537	3	.002
Linear-by-Linear Association	1.031	1	.310
N of Valid Cases	348		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.28

Table 29b Agreement to recreation higher than conservation by gender					
			Gender		Total
			Male	Female	
Q15_D	1	Count	58	40	98
		% within gender	23.4%	38.5%	27.8%
	2	Count	57	24	81
		% within gender	23.0%	23.1%	23.0%
	3	Count	94	24	118
		% within gender	37.9%	23.1%	33.5%
	4	Count	24	9	33
		% within gender	9.7%	8.7%	9.4%
	5	Count	15	7	22
		% within gender	6.0%	6.7%	6.3%
Total		Count	248	104	352
		% within gender	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.922(a)	4	.027
Likelihood Ratio	10.934	4	.027
Linear-by-Linear Association	4.787	1	.029
N of Valid Cases	352		
a 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.50.			

Table 29a shows that perceptions of park management are influenced by gender. Of particular interest from the results shown in table 29a is the fact that although around 70% of males and females believe the park should return to natural conditions, males want to do it by leaving nature alone and females by managing it. On the same vein, females and males both reject the proposition “recreation should be a higher priority than wildlife conservation” in question 15D, however, as shown in table 29b, females disapproval is stronger.

Tables 30a to 30c refer to the relation between gender and question 4 variables – activities involved in at the park. Table 30a shows the association between gender and hiking. 77% of females go hiking to the park while 57% of males answered they do so.

Table 30b shows that there is a larger proportion of females walking dogs.

Table 30c highlights how low women’s involvement in biking is in the park. 93% of females do not engage in biking while visiting the park, against 61% of men. This might be one of the reasons why, as shown in table 31, males have better perception of mountain biking than women do.

Table 30a Question 4, hiking activity and Gender					
			Gender		Total
			Male	Female	
Q4_HIKING	No	Count	108	24	132
		% within gender	42.7%	22.6%	36.8%
	Yes	Count	145	82	227
		% within gender	57.3%	77.4%	63.2%
Total		Count	253	106	359
		% within gender	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.912(b)	1	.000
Likelihood Ratio	13.536	1	.000
N of Valid Cases	359		
a Computed only for a 2x2 table			
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 38.97.			

Table 30b Question 4, walking dog activity and Gender					
			Gender		Total
			Male	Female	
Q4_WALKING DOG	No	Count	213	78	291
		% within gender	84.2%	73.6%	81.1%
	Yes	Count	40	28	68
		% within gender	15.8%	26.4%	18.9%
Total		Count	253	253	106
		% within gender	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.472(b)	1	.019
Likelihood Ratio	5.225	1	.022
N of Valid Cases	359		
a Computed only for a 2x2 table			
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 20.08.			

Table 30c Question 4, biking activity and Gender					
			Gender		Total
			Male	Female	
Q4_BIKING	No	Count	154	99	253
		% within gender	61.1%	93.4%	70.7%
	Yes	Count	98	7	105
		% within gender	38.9%	6.6%	29.3%
Total		Count	253	252	106
		% within gender	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.522(b)	1	.000
Likelihood Ratio	44.865	1	.000
N of Valid Cases	358		
a Computed only for a 2x2 table			
b 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.09.			

Table 31 Perceptions of mountain biking according to gender					
			Gender		Total
			Male	Female	
Q_19 MTNBIKE	0	Count	16	6	22
		% within gender	15.5%	13.3%	14.9%
	1	Count	16	7	23
		% within gender	15.5%	15.6%	15.5%
	2	Count	4	11	15
		% within gender	3.9%	24.4%	10.1%
	3	Count	25	9	34
		% within gender	24.3%	20.0%	23.0%
	4	Count	13	3	16
		% within gender	12.6%	6.7%	10.8%
	5	Count	29	9	38
		% within gender	28.2%	20.0%	25.7%
Total		Count	103	45	148
		% within gender	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.252(a)	5	.009
Likelihood Ratio	14.030	5	.015
Linear-by-Linear Association	1.303	1	.254
N of Valid Cases	148		
a 2 cells (16.7%) have expected count less than 5. The minimum expected count is 4.56.			

Table 32 presents information on perceived un-safety of the park. as expected perception of safety is strongly related to gender. More women than men responded that violence makes them feel unsafe in the park – 36% of women responded yes to violence as a factor of un-safety in the park and only 17% of men.

Table 32
Perception of violence and gender

			Gender		Total
			Male	Female	
VIOLENCE	No	Count	204	67	271
		% within gender	83.3%	63.8%	77.4%
	Yes	Count	41	38	79
		% within gender	16.7%	36.2%	22.6%
Total		Count	245	105	350
		% within gender	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.919(b)	1	.000
Likelihood Ratio	15.075	1	.000
Linear-by-Linear Association	15.874	1	.000
N of Valid Cases	350		

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 23.70.

Table 33 Survey sites and distribution of gender					
			Gender		Total
			Male	Female	
Survey site	Powder Canyon	Count	25	12	37
		% within gender	9.9%	11.3%	10.3%
	Turnbull Canyon	Count	108	17	125
		% within gender	42.7%	16.0%	34.8%
	Hacienda Hills Trailhead	Count	37	30	67
		% within gender	14.6%	28.3%	18.7%
	Arroyo Pescadero	Count	50	29	79
		% within gender	19.8%	27.4%	22.0%
	Hellman Park	Count	33	18	51
		% within gender	13.0%	17.0%	14.2%
Total		Count	253	106	359
		% within gender	100.0%	100.0%	100.0%

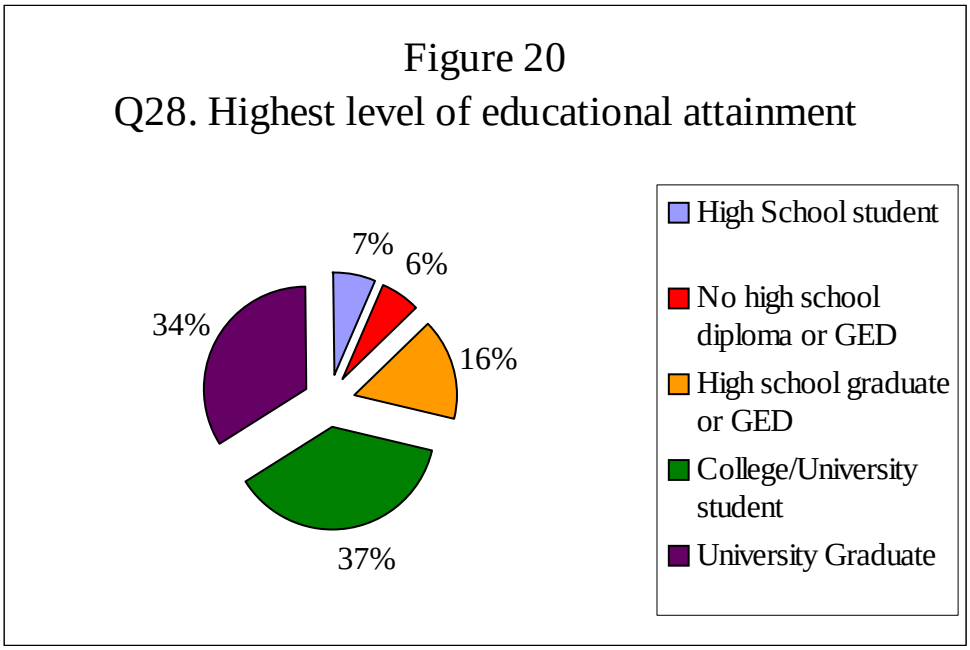
Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.649(a)	4	.000
Likelihood Ratio	27.406	4	.000
Linear-by-Linear Association	7.419	1	.006
N of Valid Cases	359		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.92.

In terms of visits to different trailheads, Turnbull Canyon concentrates male population while Hacienda Hills Trailhead and Arroyo Pescadero concentrate female population (table 33). The concentration of males in Turnbull Canyon is likely related to the high mountain bike activity in that entrance.

Education, race and income

The final 3 demographic questions refer to education, race, and income. They are described in Figures 20 to 22. Their relation to other variables has been described with those variables above, or will be described below in the section devoted to a per trailhead analysis.



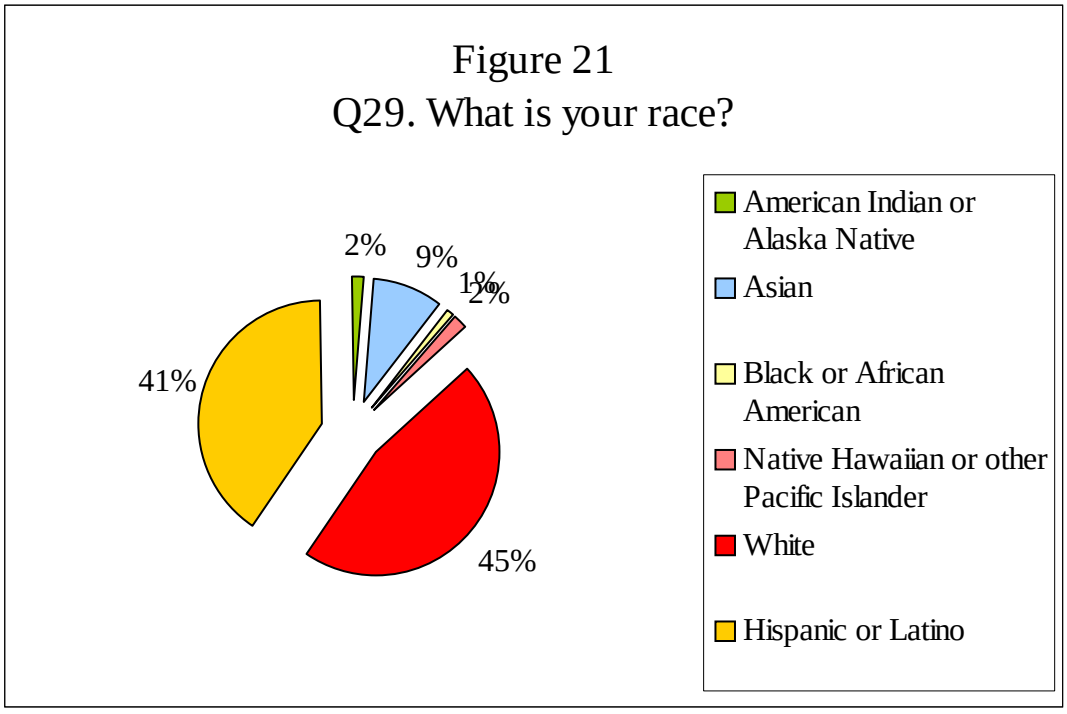


Figure 22
Q32. Household income

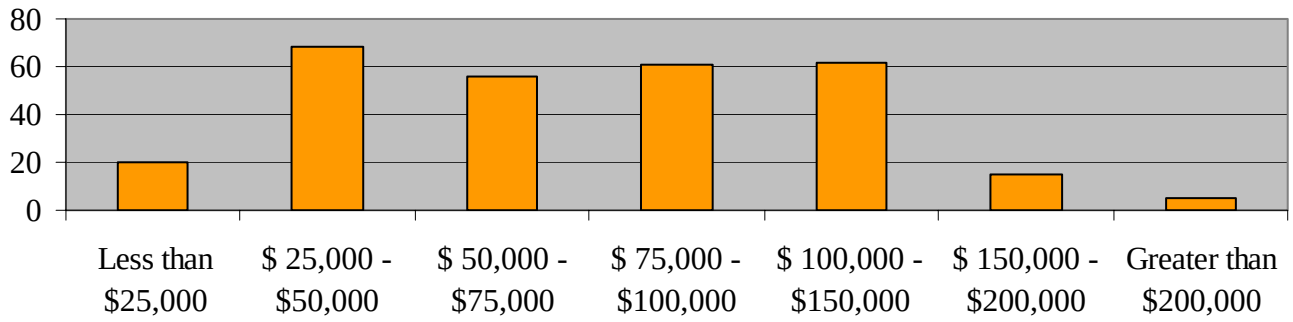


Figure 23
Q33. Do you have a physical disability?

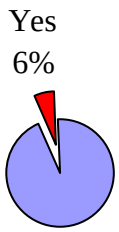
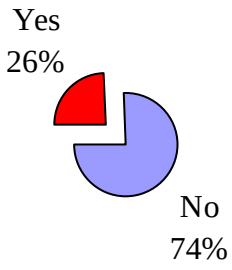


Figure 24
Q34. Have you ever experienced any barriers to access the park?



Physical disability

Figure 23 shows question 33, regarding physical disability – 6% of park users report having a physical disability. Crosstabulations don't show relation between physical disability and experienced barriers to enter the park (question 34), however, because 6% of the total n is low we can infer statistical significance.

Analysis per trailhead

In this section we present tables and Figures related to found differences between trailheads. They refer to differences in users demographics, perceptions, or activities. Some of these aspects have been already developed above, and some are of particular interest for analysis between trailheads in this section.

Q3 Why did you choose to visit the park today?

The order in the percentages of people choosing parks for solitude is very similar to the number of users per counted per park, that is, from low to high, Powder Canyon, Hellman Park, Hacienda Hills Trailhead, Arroyo Pescadero and Turnbull Canyon. Powder Canyon and Hellman Park are the trailheads more used by people who have solitude as one of the reasons for visiting the park.

Table 34
Response "fewer people" to question 3 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q3_FEWER PEOPLE	No	Count	19	94	51	60	32	256
		% of trailhead	51.4%	74.0%	70.8%	73.2%	60.4%	69.0%
	Yes	Count	18	33	21	22	21	115
		% of trailhead	48.6%	26.0%	29.2%	26.8%	39.6%	31.0%
Total		Count	37	127	72	82	53	371
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.504(a)	4	.050
Likelihood Ratio	9.104	4	.059
Linear-by-Linear Association	.008	1	.930
N of Valid Cases	371		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.47

When it comes to adventure sports Turnbull Canyon is by far the most popular site, this is quite likely related to mountain biking activity in this trailhead. On the other hand, Arroyo Pescadero is the least visited by users willing to engage in adventure sports. As we shall see in table 42 below, Turnbull Canyon is the trailhead with more mountain bikers and Arroyo Pescadero the one with less.

From the results on table 36 it can be inferred that there is a relationship between trailhead selection and educating children about nature as the reason for visiting the park. Hacienda Hills Trailhead is the trailhead with most visitors using the park for such reason. If we had interviewed minors, we would have had to take such numbers with some caution. A group such as a class of 10-15 visiting the area for educational purposes would have been enough to place Hacienda Hills Trailhead so high and influence the significance of the Pearson chi square results.

Table 35
Response "adventure sports" to question 3 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q3_SPORT	No	Count	29	71	63	76	38	277
		% of trailhead	78.4%	56.3%	87.5%	92.7%	71.7%	74.9%
	Yes	Count	8	55	9	6	15	93
		% of trailhead	21.6%	43.7%	12.5%	7.3%	28.3%	25.1%
Total		Count	37	126	72	82	53	370
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43.424(a)	4	.000
Likelihood Ratio	45.616	4	.000
Linear-by-Linear Association	9.552	1	.002
N of Valid Cases	370		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.30

Table 36
Response "educate children about nature" to question 3 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q3_EDUCATE	No	Count	35	114	54	73	47	323
		% of trailhead	94.6%	91.2%	75.0%	89.0%	88.7%	87.5%
	Yes	Count	2	11	18	9	6	46
		% of trailhead	5.4%	8.8%	25.0%	11.0%	11.3%	12.5%
Total		Count	37	37	125	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.826(a)	4	.008
Likelihood Ratio	12.380	4	.015
Linear-by-Linear Association	.876	1	.349
N of Valid Cases	369		

a 1 cells (10%) have expected count less than 5. The minimum expected count is 4.61

Table 37 shows that Powder Canyon and Arroyo Pescadero are the preferred trailheads of those who visit the park to see/hear wildlife. Although the numbers in Turnbull Canyon, Hacienda Hills Trailhead and Hellman Park are a bit lower (around 35-40%), these are still large percentages of people whose reason to visit the park is to interact with wildlife.

Table 37
Response "see/hear wildlife" to question 3 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q3_WILDLIFE	No	Count	16	82	44	40	32	214
		% of trailhead	43.2%	64.6%	61.1%	48.8%	60.4%	57.7%
	Yes	Count	21	45	28	42	21	157
		% of trailhead	56.8%	35.4%	38.9%	51.2%	39.6%	42.3%
Total		Count	37	37	127	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.826(a)	4	.008
Likelihood Ratio	12.380	4	.015
Linear-by-Linear Association	.876	1	.349
N of Valid Cases	369		

a 1 cells (10%) have expected count less than 5. The minimum expected count is 4.61

Q4 Which activities did you engage in today?

Results of question 4 show that type of activity is one of the variables that most influences trailhead selection. From the 8 options provided, 6 show statistically significant relations with trailhead (Pearson 0.019 being the lowest).

Powder Canyon and Arroyo Pescadero have the highest percentage of users responding they visit the park to enjoy scenic beauty, these are the same trailheads to which people go in order to see/ hear wildlife. Turnbull Canyon ranks the lowest in terms of visitors using the trailhead to enjoy scenic beauty.

Dog walkers are more evenly distributed than other activities described here, however, Powder Canyon and Hacienda Hills Trailhead have the highest percentage of them. Interestingly, although Arroyo Pescadero is the park with the highest percentage of hikers it does not rank as high as Powder Canyon and Hacienda Hills Trailhead, it is however the park most preferred by those choosing it for scenic reasons.

Table 38 Response “Hiking” to question 4 by trailhead								
			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q4_HIKING	No	Count	13	74	16	14	19	136
		% of trailhead	35.1%	58.3%	22.2%	17.1%	35.8%	36.7%
	Yes	Count	24	53	56	68	34	235
		% of trailhead	64.9%	41.7%	77.8%	82.9%	64.2%	63.3%
Total		Count	37	37	127	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45.600(a)	4	.000
Likelihood Ratio	46.628	4	.000
Linear-by-Linear Association	14.121	1	.000
N of Valid Cases	371		

a 1 cells (10%) have expected count less than 5. The minimum expected count is 13.56

Table 39 Response “Jogging” to question 4 by trailhead								
			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q4_JOGGING	No	Count	36	93	53	58	35	275
		% of trailhead	97.3%	73.2%	73.6%	70.7%	66.0%	74.1%
	Yes	Count	1	34	19	24	18	96
		% of trailhead	2.7%	26.8%	26.4%	29.3%	34.0%	25.9%
Total		Count	37	37	127	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.721(a)	4	.013
Likelihood Ratio	17.313	4	.002
Linear-by-Linear Association	6.848	1	.009
N of Valid Cases	371		

a 1 cells (10%) have expected count less than 5. The minimum expected count is 9.57

Table 40
Response "enjoy scenic beauty" to question 4 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q4_SCENIC	No	Count	21	108	44	39	32	244
		% of trailhead	56.8%	85.0%	61.1%	47.6%	60.4%	65.8%
	Yes	Count	16	19	28	43	21	127
		% of trailhead	43.2%	15.0%	38.9%	52.4%	39.6%	34.2%
Total		Count	37	37	127	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.736(a)	4	.000
Likelihood Ratio	38.088	4	.000
Linear-by-Linear Association	11.519	1	.001
N of Valid Cases	371		

a 1 cells (10%) have expected count less than 5. The minimum expected count is 9.57

Table 41
Response "walking dog" to question 4 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q4_WALK DOG	No	Count	26	108	51	65	48	298
		% of trailhead	70.3%	85.0%	70.8%	79.3%	90.6%	80.3%
	Yes	Count	11	19	21	17	5	73
		% of trailhead	29.7%	15.0%	29.2%	20.7%	9.4%	19.7%
Total		Count	37	37	127	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.832(a)	4	.019
Likelihood Ratio	11.972	4	.018
Linear-by-Linear Association	1.453	1	.228
N of Valid Cases	371		

a 1 cells (10%) have expected count less than 5. The minimum expected count is 7.28

Table 42 shows that Hellman Park stands out as a trailhead used by photographers, however, taking into consideration the warnings made for table 35, we must state that one group of photographers using the trailhead and answering the surveys might have been enough to show this significance.

Table 42
Response "photographing" to question 4 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q4_PHOTO	No	Count	33	119	69	80	43	344
		% of trailhead	89.2%	93.7%	95.8%	97.6%	81.1%	92.7%
	Yes	Count	4	8	3	2	10	27
		% of trailhead	10.8%	6.3%	4.2%	2.4%	18.9%	7.3%
Total		Count	37	37	127	72	82	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.293(a)	4	.004
Likelihood Ratio	13.333	4	.010
Linear-by-Linear Association	1.254	1	.263
N of Valid Cases	371		

a 2 cells (20%) have expected count less than 5. The minimum expected count is 2.69

Table 43
Response "bicycle riding" to question 4 by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Q4_BIKE	No	Count	29	50	66	78	39	262
		% of trailhead	78.4%	39.4%	91.7%	96.3%	73.6%	70.8%
	Yes	Count	8	77	6	3	14	108
		% of trailhead	21.6%	60.6%	8.3%	3.7%	26.4%	29.2%
Total		Count	37	37	127	72	81	53
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	102.567(a)	4	.000
Likelihood Ratio	109.764	4	.000
Linear-by-Linear Association	28.518	1	.000
N of Valid Cases	370		

a 0 cells (0%) have expected count less than 5. The minimum expected count is 10.80

Table 43 confirms what is already evident, that Turnbull Canyon is the main trailhead used by bikers. Hellman Park and Powder Canyon also have an important percentage of bikers (around 25%), but are far from the 60% shown for Turnbull Canyon. Arroyo Pescadero and Hacienda Hills Trailhead are seldom used by bikers.

Figures 25 to 29 show each trailhead users' opinion about different management options. Support for ranger lead hikes is particularly high in Hacienda Hills Trailhead and similarly lower in Powder Canyon and Arroyo Pescadero. Temporary and permanent closures also receive a relatively high support in Hacienda Hills Trailhead, and a particularly high opposition to permanent closures is found in Turnbull Canyon and Hellman Park.

Figure 25
HACIENDA Management Options

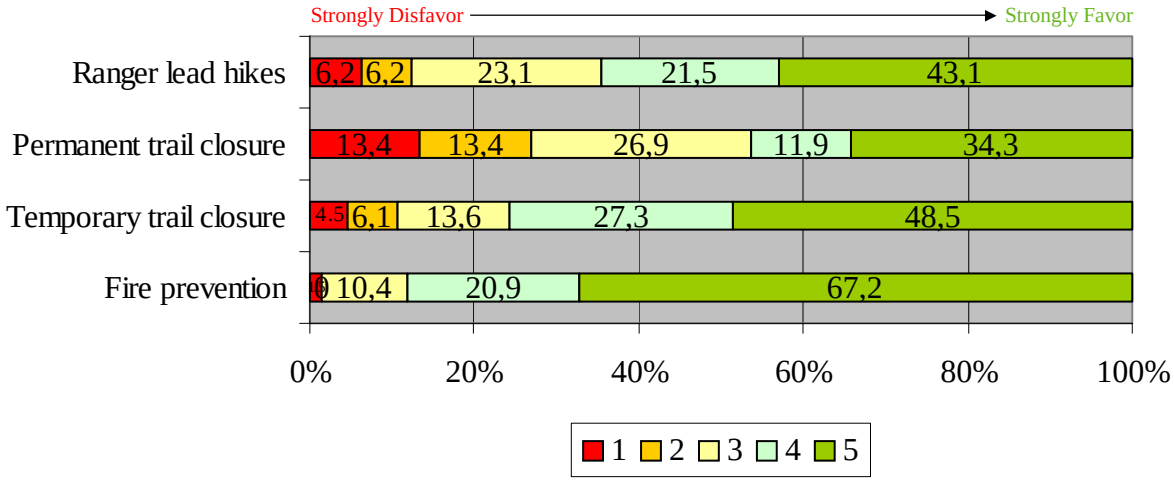


Figure 26
ARROYO PESCADERO Management Options

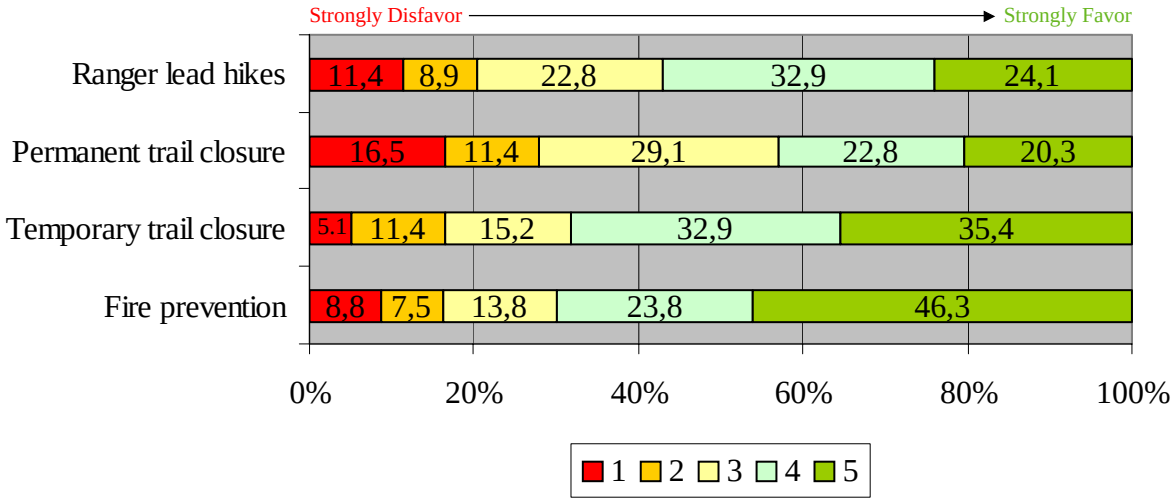


Figure 27
POWDER Management Options

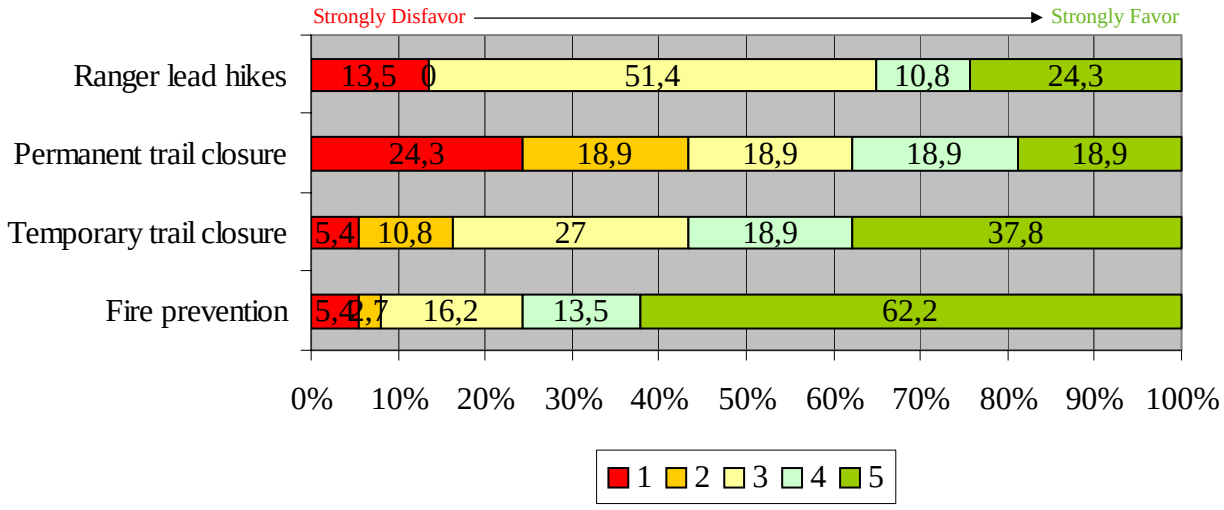
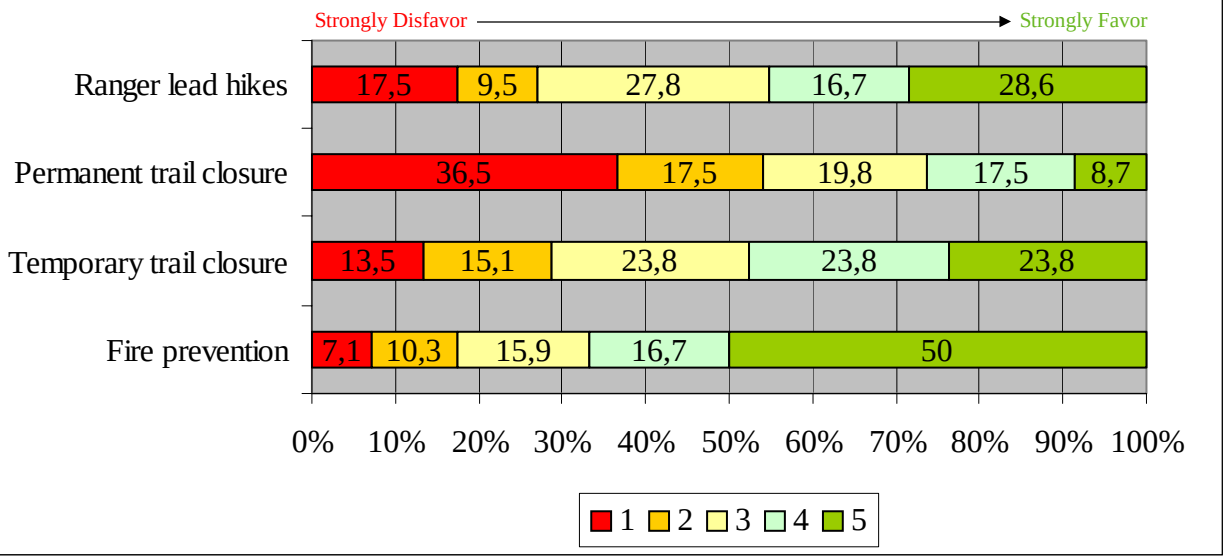
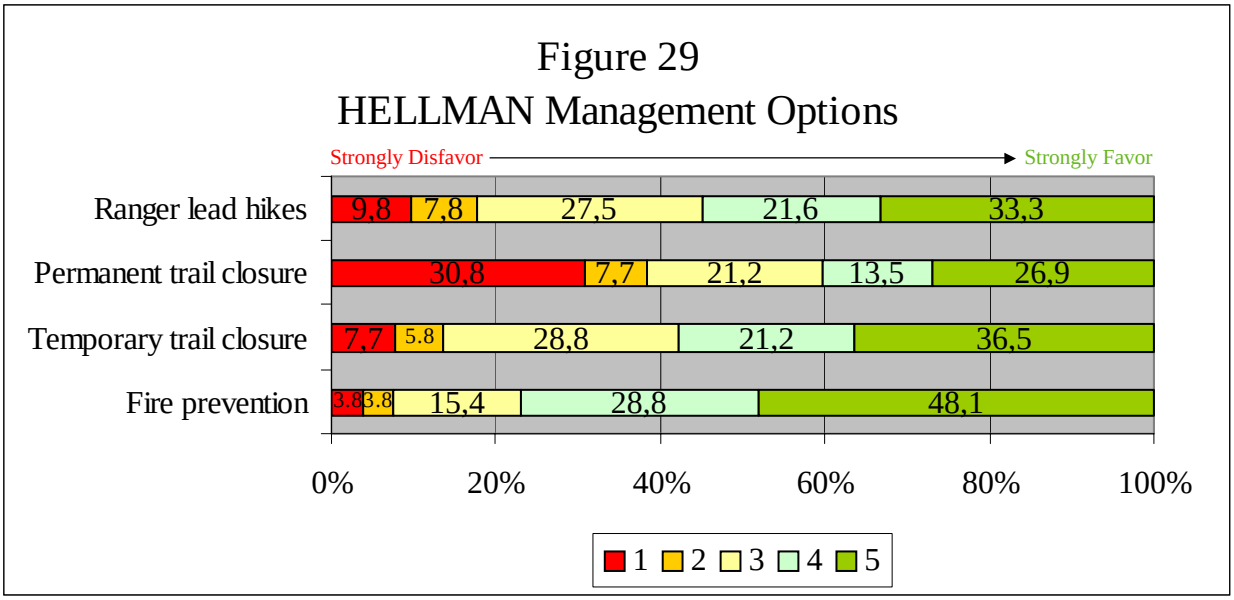


Figure 28
TURNBULL Management Options





Activities perception

In table 44 we analyze question 19 from a different perspective. The responses were given on a 1 to 5 scale, one being a strongly negative opinion on an activity and 5 a strongly positive one. We took the mean for each activity and the mean for each activity by trailhead.

Table 44
Mean perception of activities by trailhead

Activity	Survey site					All Park
	Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
Biking	2.6	3.5	2.7	2.0	2.1	2.8
Horseback Riding	3.2	2.4	2.8	2.3	2.0	2.5
Hiking	3.6	3.8	3.3	3.4	3.2	3.5
Jogging	3.5	3.7	3.1	3.2	3.1	3.4
Dog Walking	3.1	3.1	3.2	2.7	2.7	3.0
All Activities	3.2	3.3	3	2.7	2.6	3.0

Horseback riding is the least popular activity, even in trailheads in which we did not register any horseback riding activity. The only exception is Powder Canyon, where horseback riding is practiced more often and to an extent Hacienda Hills Trailhead. Biking is not a popular activity either, particularly in Arroyo Pescadero and Hellman Park. It is obviously popular in Turnbull Canyon were the majority of the users practice this activity. Even so, views of hiking and jogging are more positive than biking in Turnbull Canyon, and all other trailheads. Dog walking is right at the average with the other activities, it is only higher than the average in Hacienda

Hills Trailhead, where the major percentage of dog walkers concentrate (see table 40). Finally, Arroyo Pescadero and Hellman Park are the trailheads in which users have less positive perception of other activities, being .3 and .4 below the mean for all parks.

Rules

Table 45 shows the results of stated rules knowledge by trailhead. It is to be expected that not everyone that answered yes to question 12 actually knows the rules, but this table still provides an approximation to which trailhead users know more about park rules or even the existence of such rules. Almost 95% of Powder Canyon users state they know the rules, at the other extreme is Arroyo Pescadero with around 70% of its users stating knowledge of the rules.

Table 45
Rules knowledge by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
REGLAS	No	Count	2	24	15	20	11	72
		% of trailhead	5.6%	21.6%	23.8%	27.8%	23.9%	22.0%
	Yes	Count	34	87	48	51	35	255
		% of trailhead	94.4%	78.4%	76.2%	70.8%	76.1%	77.7%
Total		Count	36	111	63	72	46	328
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 46
Experienced barriers to access the park by trailhead

			Survey site					Total
			Powder Canyon	Turnbull Canyon Trailhead	Hacienda Hills	Arroyo Pescadero	Hellman Park	
DIFFICULT ACCESS	No	Count	20	99	52	50	33	254
		% of trailhead	57.1%	82.5%	80.0%	66.7%	71.7%	74.5%
	Yes	Count	15	21	13	25	13	87
		% of trailhead	42.9%	17.5%	20.0%	33.3%	28.3%	25.5%
Total		Count	35	120	65	75	46	341
		% of trailhead	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Chi square

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.231(a)	4	.010
Likelihood Ratio	12.906	4	.012
Linear-by-Linear Association	.349	1	.555
N of Valid Cases	341		

a 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.93

Barriers

A quarter of park users stated they have experienced some barriers to access the park. In this case is of particular important to know the numbers by trailhead. Table 46 shows that more than 40% of Powder Canyon users, and more than 30% of Arroyo Pescadero users claim to have experienced barriers to access the park.

Conclusions and policy recommendations

Some of the results obtained with the survey and presented above can help guide communication between park managers and users, as well as assist in future decision making.

Results from opposition to temporary and permanent trail closures might open the door to "temporarily" trail closures for long periods of time until it ends up being a permanent closure. Although this measure is likely to receive less opposition from visitors, in the long term, support for needed real temporary closures might be hard to obtain. It is therefore recommended that trail closures are decided based on ecological data in conjunction with data on trail use and in consultation with users. This survey shows that a majority of visitors are interested in nature preservation, naturalness, sharing the park with wildlife, and don't consider that recreation should take priority over conservation, therefore convincing the public about trail closure is not necessarily an impossible task. If it becomes important to permanently close a particularly popular trail, it appears that fire prevention is one of the reasons users consider important and would oppose less to.

Support for management focused on conservation rather than on recreation is relatively high, and perceptions of wildlife would help support a type of management that puts wildlife first. Implementation is obviously a different story and a single incident of negative wildlife – human interaction can turn support to opposition. It is important to rely on these results not as a justification for management options but as tools to build policy and management options that will resonate with park users and therefore help in the education/participation process.

An example of what we stated in the previous paragraph can be built from the 32% support for "leaving nature alone" as a park management option. This percentage might drastically fall with the occurrence of one drastic wildfire. At the same time, the fact that 32% believe nature should be left alone does not mean that the same percentage will support closing most trails in order to do so. However, having this information allows us to build policy and outreach strategies that, taking this fact into account, will justify and negotiate the closure of important trails based on wildlife's best interest and natural processes conservation.

Figure 1 shows that an important number of people visit the park with reasons related to solitude (escape the city; experience fewer people, etc). This is a fact to bear in mind when planning trail closures that might intensify users' interactions.

As we saw in tables 14a to 14c, younger generations do not value the experiencing nature or being outdoors part of their park experience as much as older ones. Unless their "experiencing of nature" is defined in different terms, this should be a factor of concern for future park management and be tackled at the environmental education level.

In terms of reaching users to educate them and make them participants in park management, although the number of new users is higher than expected, complicating outreach by park management authorities, the mean number of visits per month and the concentration of house zip

codes will make outreach less of a challenge. It is important to note that in Hacienda Hills Trailhead, Hellman Park and Arroyo Pescadero education trail hikes lead by rangers have relatively high support.

Given the results over sources of information, it appears as if the most effective outreach will come out of direct contact with users. Rangers can play an important role on this, but their numbers and time is limited. Moreover, formal trail hikes do not seem to sparkle much interest in users. A more informal outreach approach carried by rangers could be an option, but it would require higher presence and interaction. Park signs are another important source of information that should be explored, as it can be cost effective and flexible.

Coping mechanisms are already being used by at least 15% of park users. Although most refer to small changes in park use, we do not have previous data to establish a trend. Neither can we establish a trend with regards to interactions between mountain bikers and other activities, but given the sport is relatively new we can only expect this one to be increasing. Management options might need to be disguised to prevent an increase in conflicts between uses. Park signs could be effective, but zoning activities might need to be considered, and trail maps provided would be an aid to find the best location for this zoning both in terms of use and conservation. One of the negative sides of zoning is the need for enforcement, which has a cost and if not done properly could also derive in conflict with some activity users. Whichever the management choice, it is vital to keep an eye on coping mechanism trends to avoid adaptation that would make it hard to find coping mechanisms in the future. This issue becomes more important when we consider that solitude and being in contact with nature are prominent among the reasons for visiting the park.

The male to female park use ratio is almost 4:1. Security could influence this ratio, but is not the reason for having such a difference in usage. Although park authority has little to do to alter societal trends of park use, management options should look at ways of “inviting” females to use the park, even if only because females are more supportive of park management for conservation rather than recreation and increasing their use will facilitate some management decisions in the future.

The purpose of this research was to better understand trail use as well as users’ perceptions of the park and its management. This report should enable the Habitat Authority to make informed decisions on future trail management options and provide valuable background in which to base future outreach alternatives.

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Appendices