

Section 2: 2003 vs. 2004 Fire time periods

About the results:

If a heavily fire-affected year is indeed different than a non fire-affected year in terms of use patterns, visitor characteristics, and attitudes, significant differences should be found between the responses of the two years. As expected, several significant differences did occur between the overall 2003 season and the overall 2004 season. This section examines those differences and explains how an active fire season affects the factors studied. It is also reasonable to assume that not all of the 2003 season was heavily affected by fire. Fires did not start until mid July and trailhead closures did not start until the end of July. Similarly, by the end of September, the fires had passed and all the trailheads had reopened in time for the fall hunting season. Therefore, to further understand the influence of fire, both years were split into 3 time periods, based on the occurrence of fires and fire fighting activity in 2003.

- Pre fire (June and July)
- During fire (August and September)
- After fire (October)

The ‘pre fire’ period was the time period that occurred before the 2003 fires started to have an impact on visitation. By the beginning of August, trailhead closures had begun and many sections of the BMWC were closed to recreational use. This ‘during fire’ time period lasted until fires were extinguished and trailheads reopened at the end of September. The remainder of the season was deemed the ‘after fire’ time period. This division of the year into these periods allowed a detailed comparison of similar time periods between 2003 and 2004.

First a comparison was conducted with all the data of 2003 and all the data of 2004. All questions common to both studies were statistically tested for significant differences. In turn, each of the time periods were tested against each other in a similar manner, i.e. ‘pre fire’ period 2003 vs. ‘pre fire’ period 2004.

As the ‘pre fire’ and ‘after fire’ time periods were not significantly affected by fire in 2003, they should not show many significant differences when compared with the same time periods in 2004. Indeed this was the case, the non-fire time periods for each

year showed no significant differences. Perhaps predictably, the 'during fire' time period for each year showed the most differences. In addition, when overall comparisons of each year were run, the only significant differences found were the same ones found for the 'during fire' time periods. Therefore the differences that appeared in the overall comparisons of each year can be explained by the differences found in the 'during fire' time period.

How were the Visitors themselves different in 2003 and 2004?

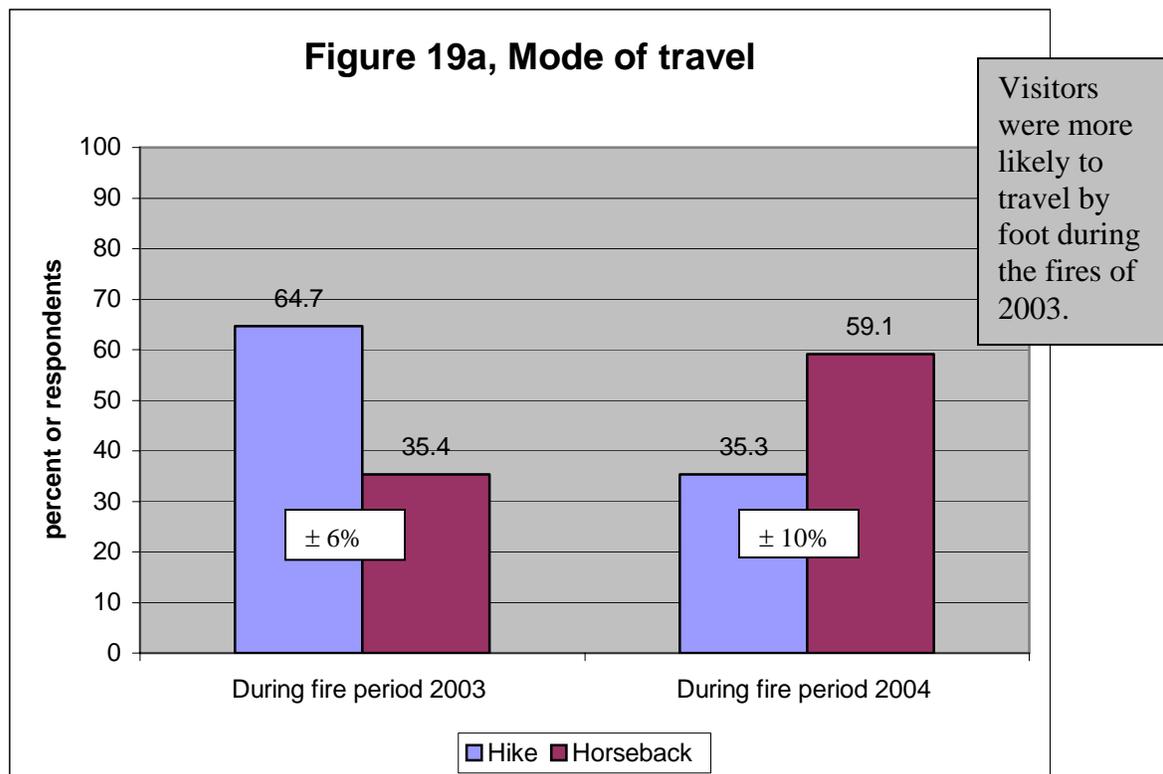
The visitor characteristics under investigation in this study were: age, sex, level of education, place of residence, and previous experience in BMWC. In all cases, visitor characteristics did not show a significant difference between overall comparisons of 2003 and 2004 or between the three individual time period comparisons for each year. The conclusion is that the characteristics of the visitors themselves were not different for the two years.

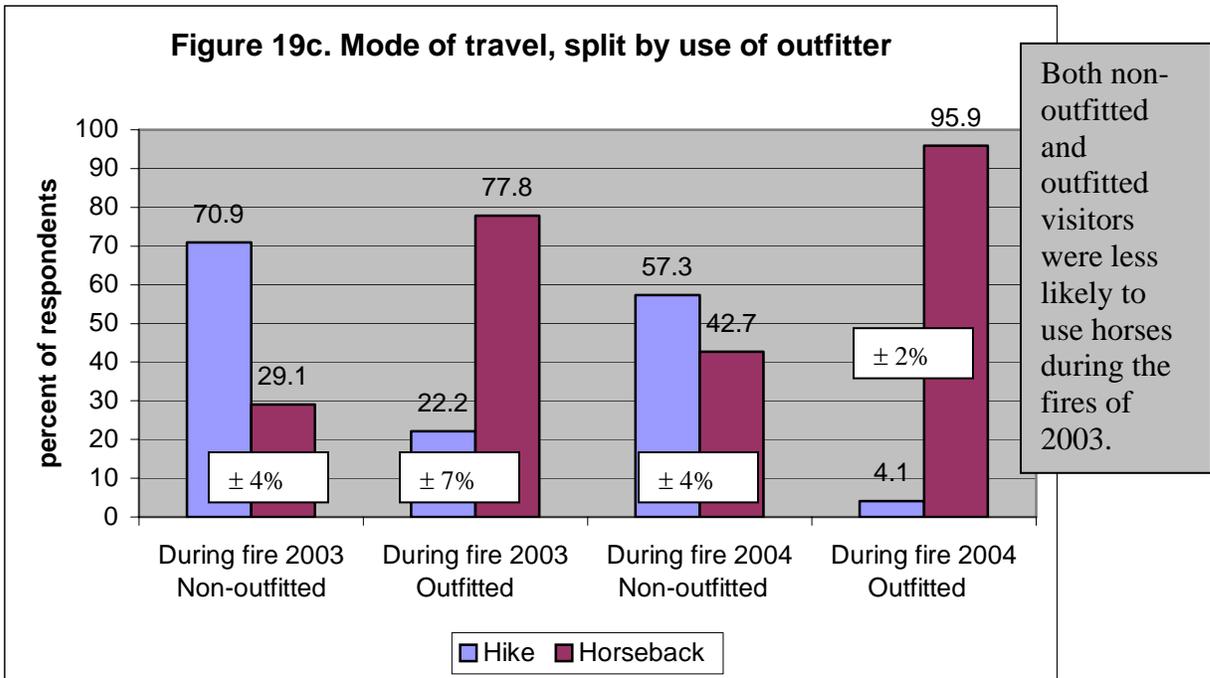
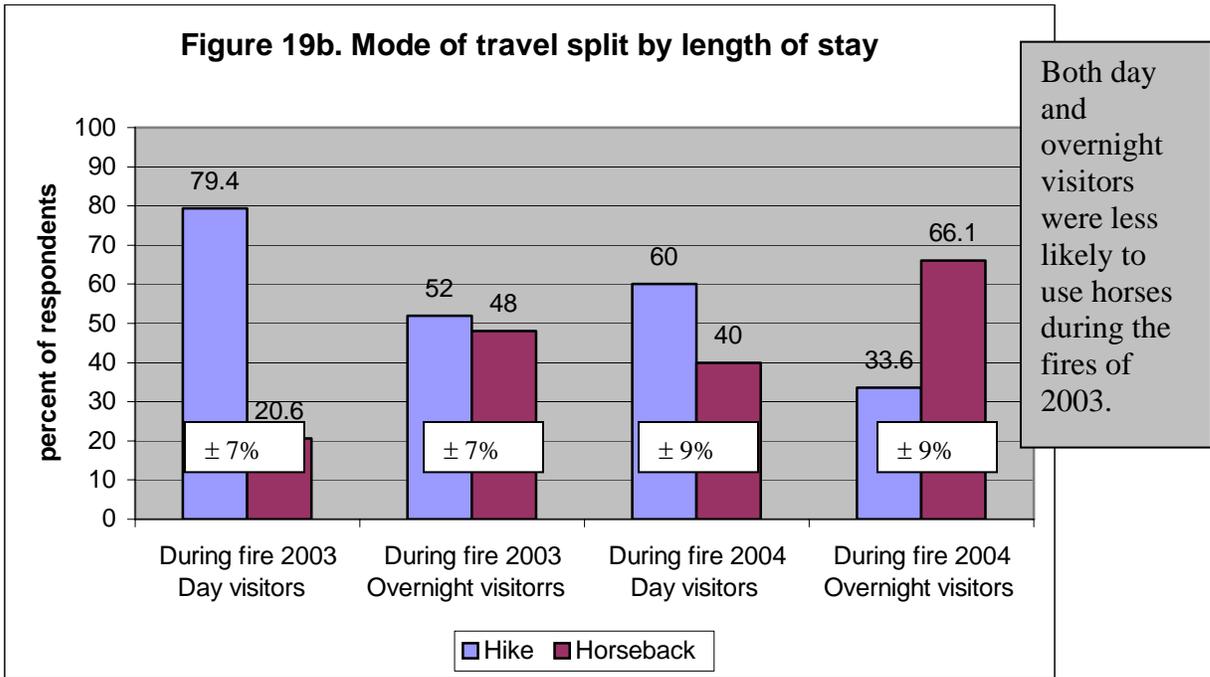
How were the characteristics of a BMWC visit different in 2003 and 2004?

Although the characteristics of the people that visited the BMWC did not change, the characteristics of their visits did show several significant differences between the two years. The characteristics of a BMWC visit under study in this investigation were: party size, mode of travel, number of livestock used, activities participated in, length of stay, use of outfitters, and number of encounters with other groups. Characteristics that showed overall significant differences are shown below. There were no significant differences between 2003 and 2004 for party size. Much like the previous section, each characteristic was also subdivided to investigate differences between: length of stay (day versus overnight), use of outfitter (outfitted versus non-outfitted), and mode of travel (hiking versus horseback).

Mode of Travel

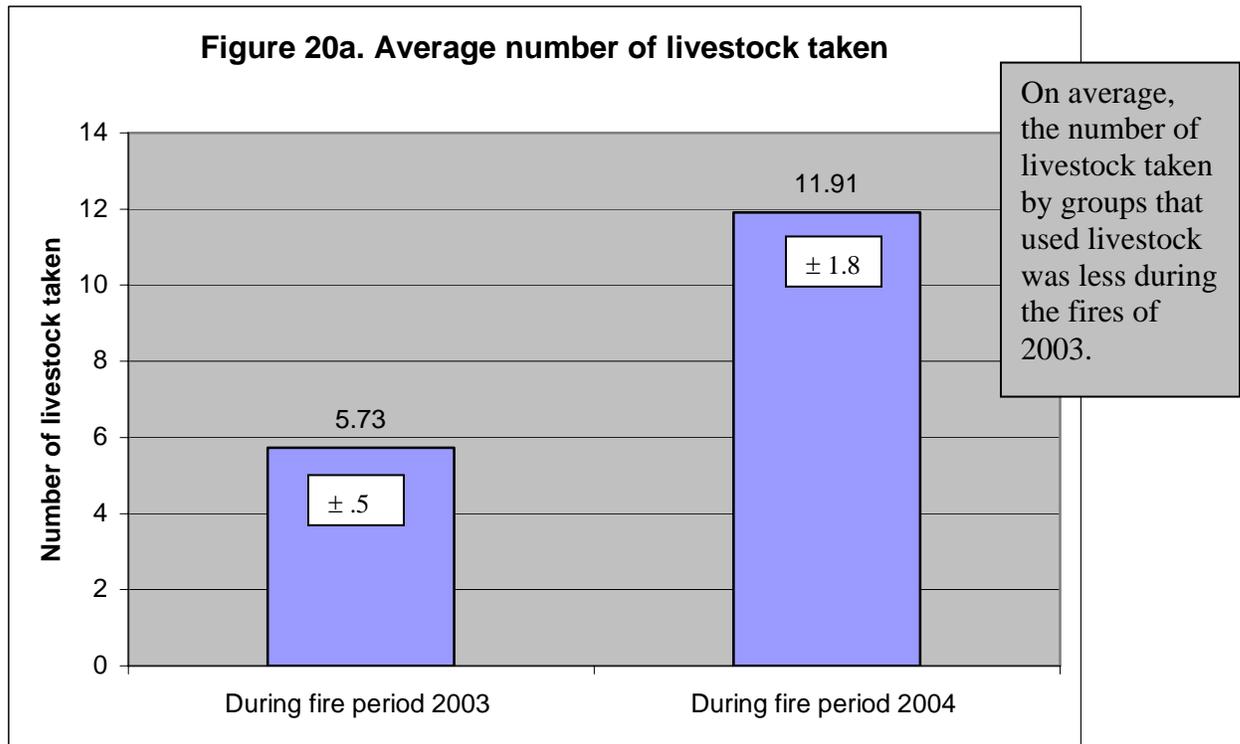
Respondents were asked to indicate their primary mode of travel in the wilderness. The options were: hike (carrying equipment ourselves), boat (raft, canoe, kayak, etc), hiked (leading horses or other livestock), or horseback. No significant differences were found in the 'pre fire' and 'after fire' time period comparisons. However, the 'during fire' comparison did yield significant differences in hiking and horseback riding. Significant differences were also found when mode of travel was further split by length of stay and use of outfitter.



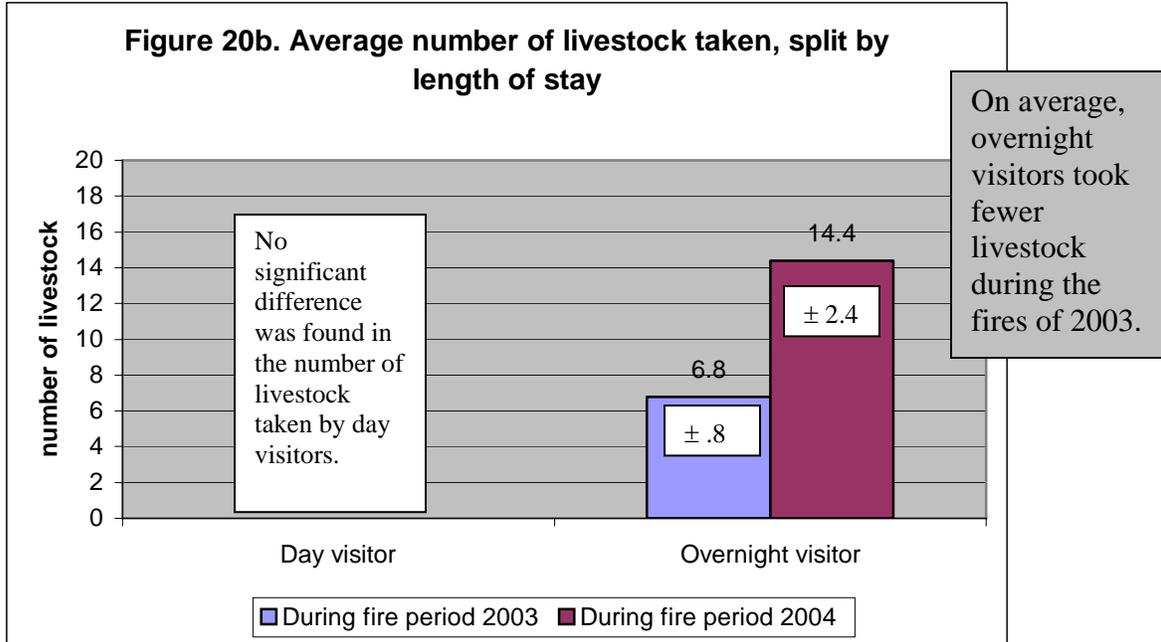


Number of livestock

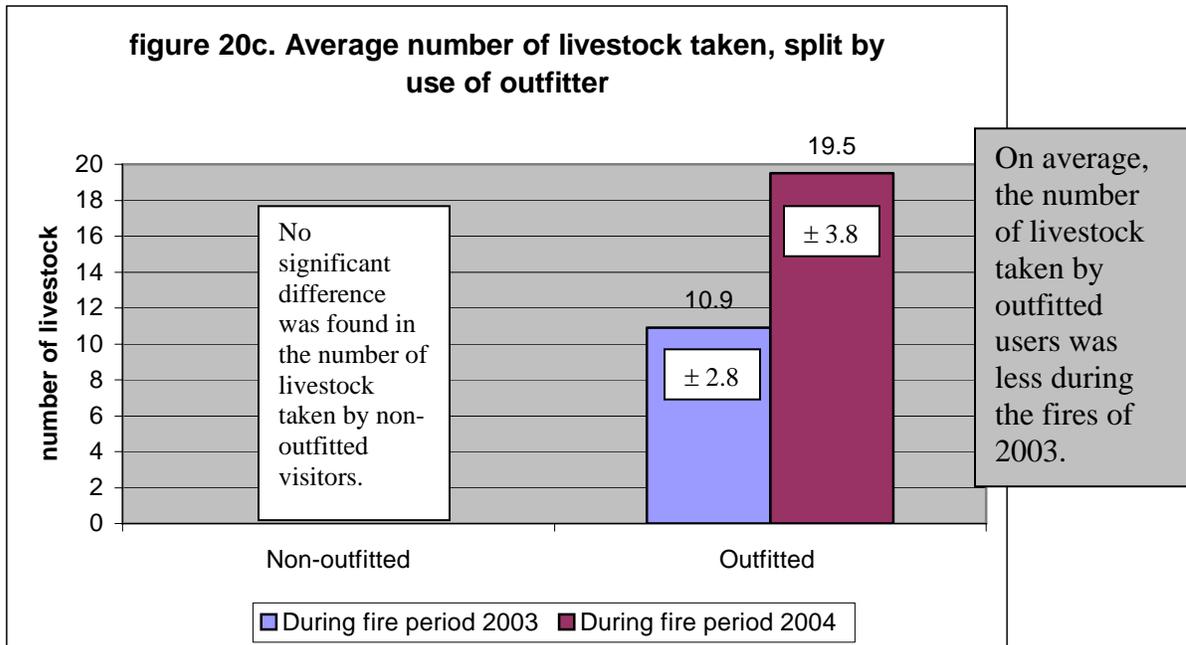
Respondents who were in parties that used horses or other livestock were asked how many horses or other livestock their party used. No significant differences were found in the 'pre fire' and 'after fire' time period comparisons. The 'during fire' time period did yield significant differences between the years.



When the number of livestock taken was split into day and overnight users within the ‘during fire’ period, no significant difference was found in the number of livestock taken by day visitors. A significant difference was found in the number of livestock taken by overnight visitors.

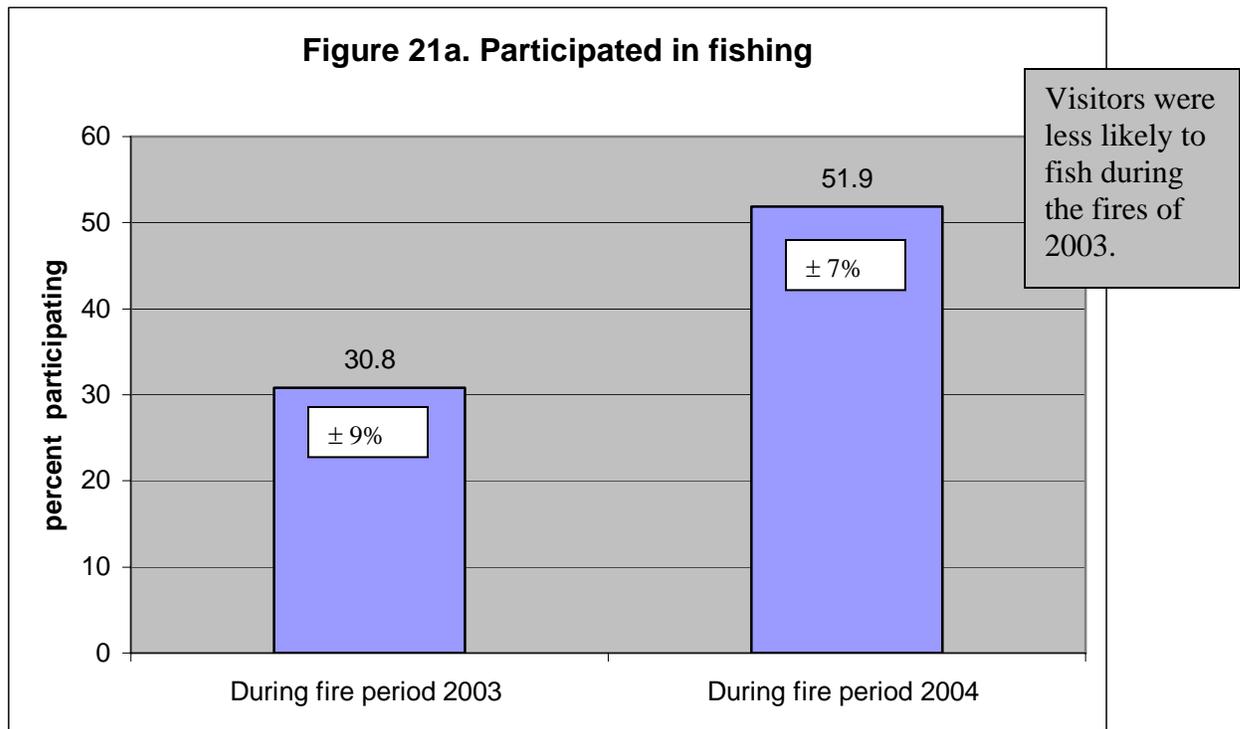


When the number of livestock taken was split by outfitter use within the ‘during fire’ period, no significant difference was found in the number of livestock taken by non-outfitted visitors. A significant difference was found in the number of livestock taken by outfitted visitors.



Activities

Respondents were asked to identify all of the activities in which they participated in the BMWC on the specific trip for which they were questioned. The options were: fishing, hunting, hiking, nature study (bird watching, identifying wild flowers, rock study, etc.), mountain climbing (using ropes, special equipment, etc), rafting, swimming, or taking pictures. No significant differences were found in the 'pre fire' and 'after fire' time period comparisons. The only significant difference found was in the percentage of respondents participating in fishing in the 'during fire' time period.



Significant differences between the years were found when fishing was split by use of outfitter, length of stay, and mode of travel.

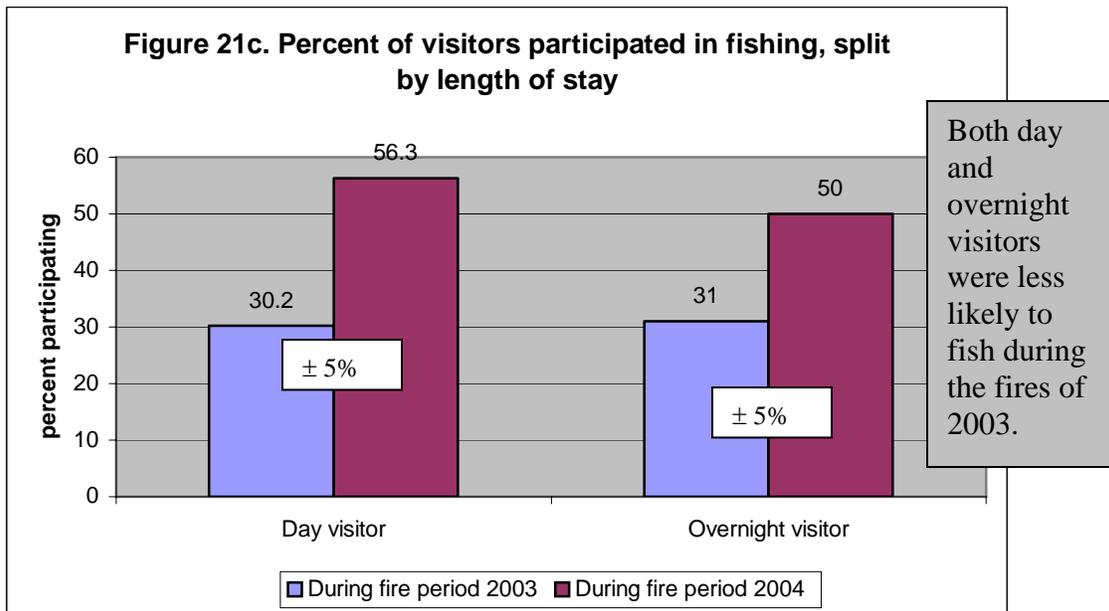
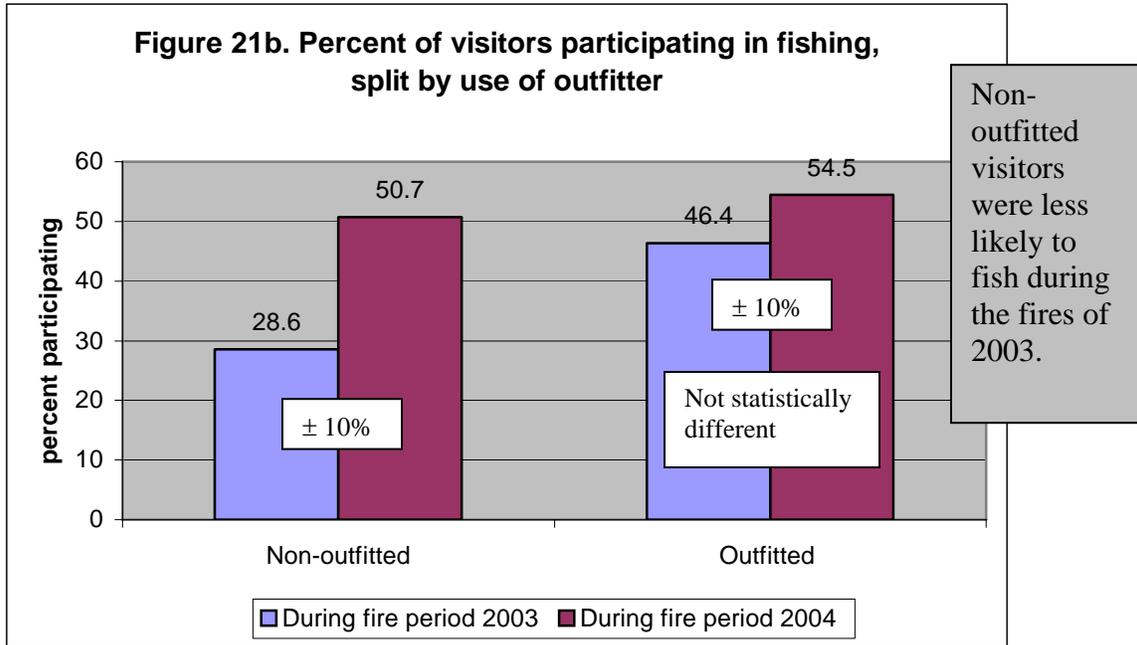
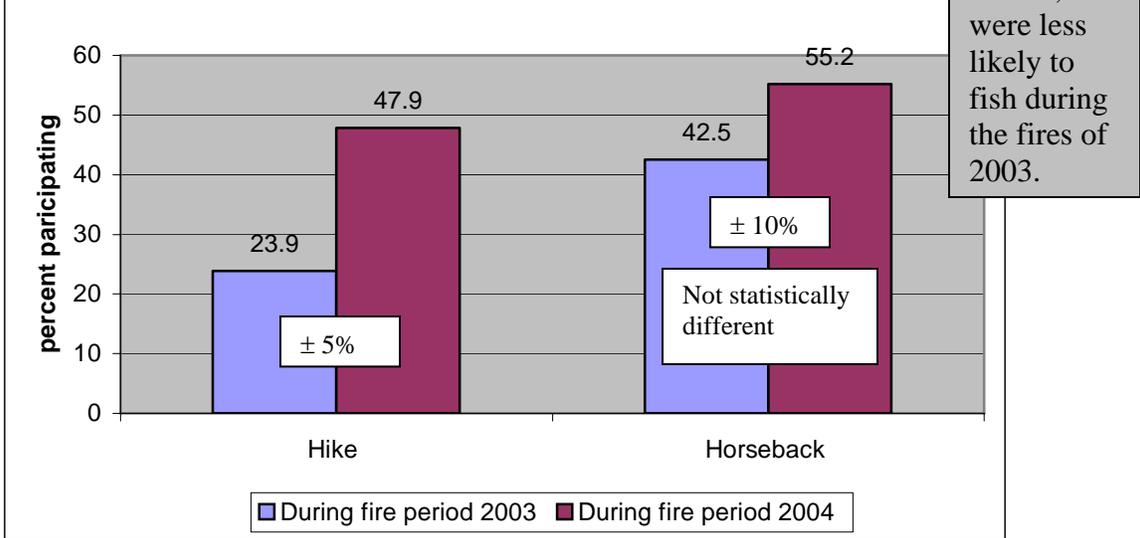
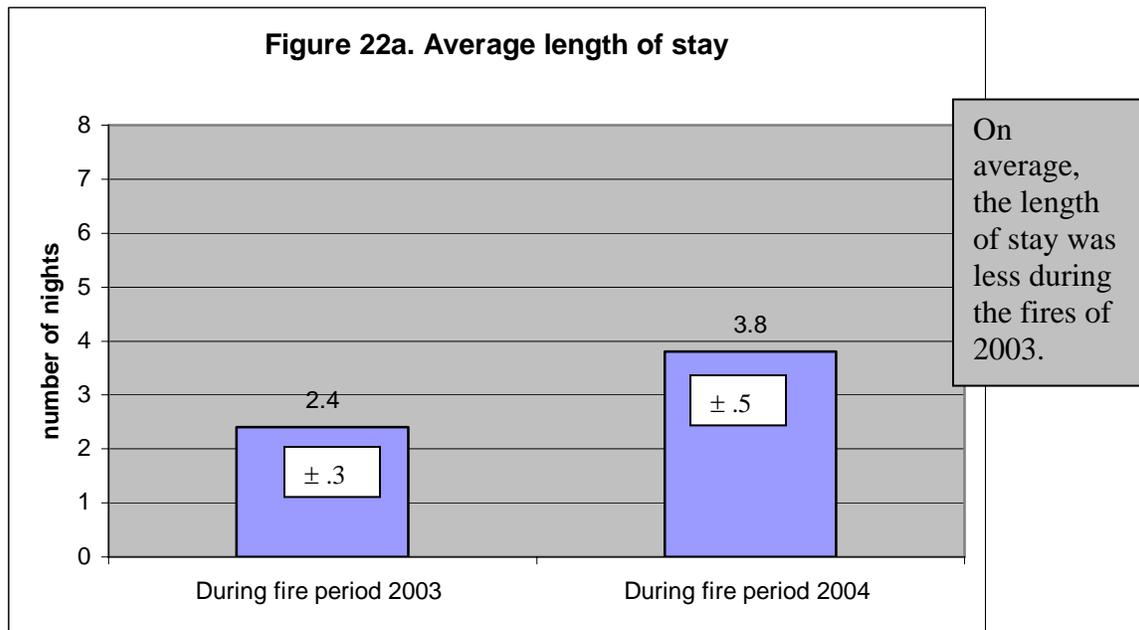


Figure 21d. Percent of visitors participating in fishing, split by mode of travel

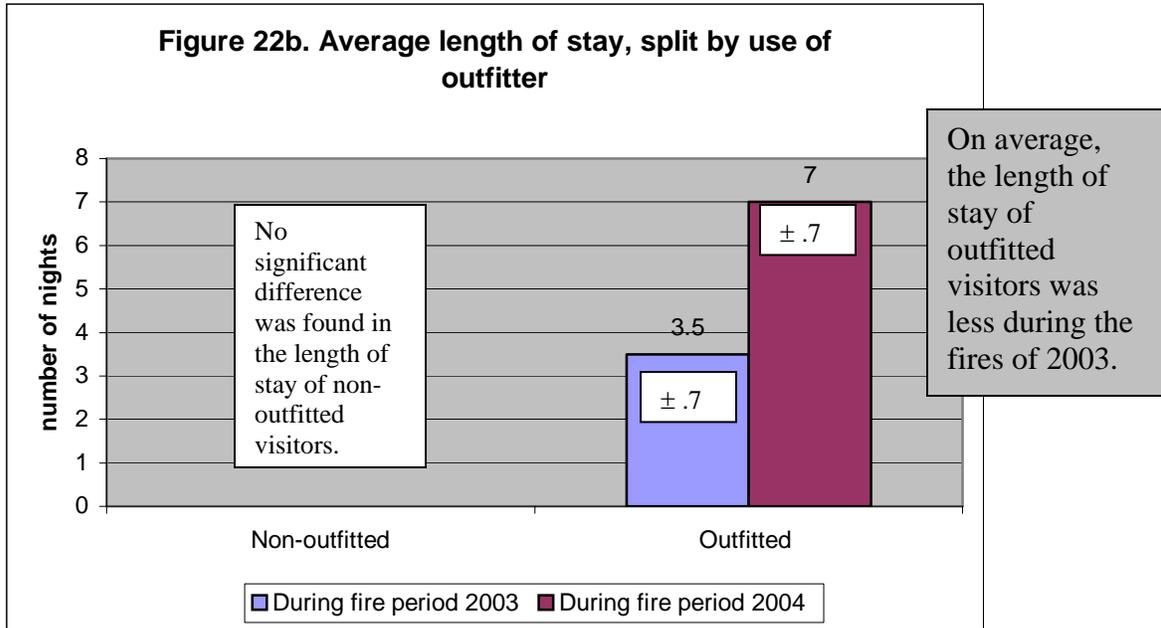


Length of stay

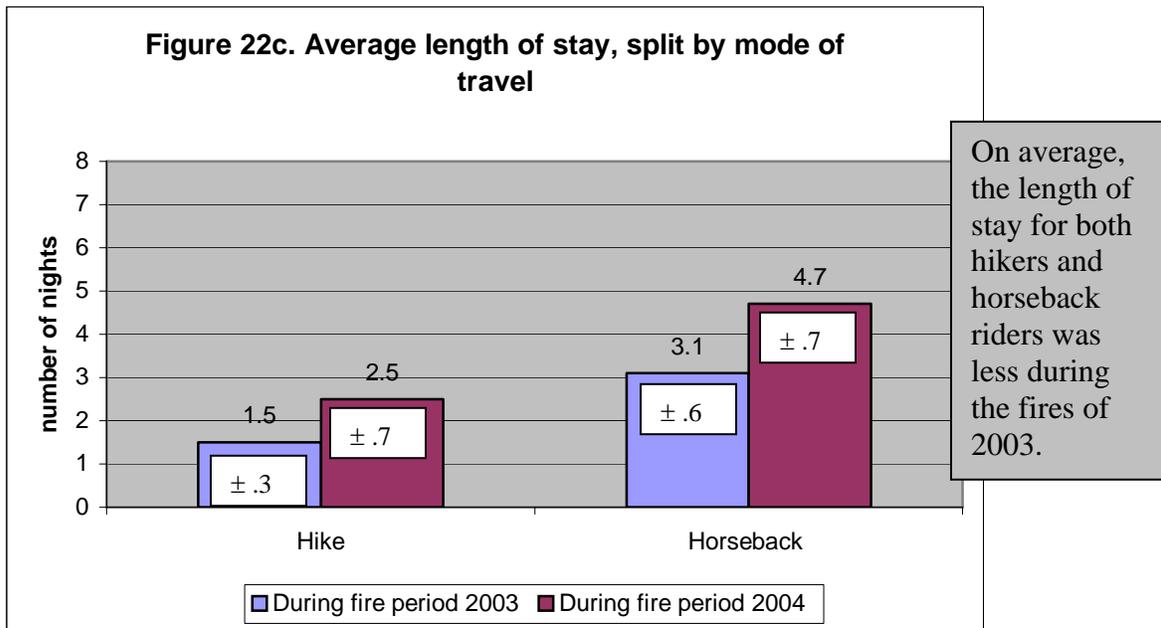
Respondents were asked how many nights their party stayed in the wilderness, beyond the road, on this particular visit. Day visitors were recorded as zero. No significant differences in length of stay were found in the 'pre fire' and 'after fire' time period comparisons. Significant differences were found in the 'during fire' comparison.



When length of stay was split by outfitter use within the ‘during fire’ period, no significant difference was found for the non-outfitted visitors. A significant difference was found in the length of stay of outfitted visitors.

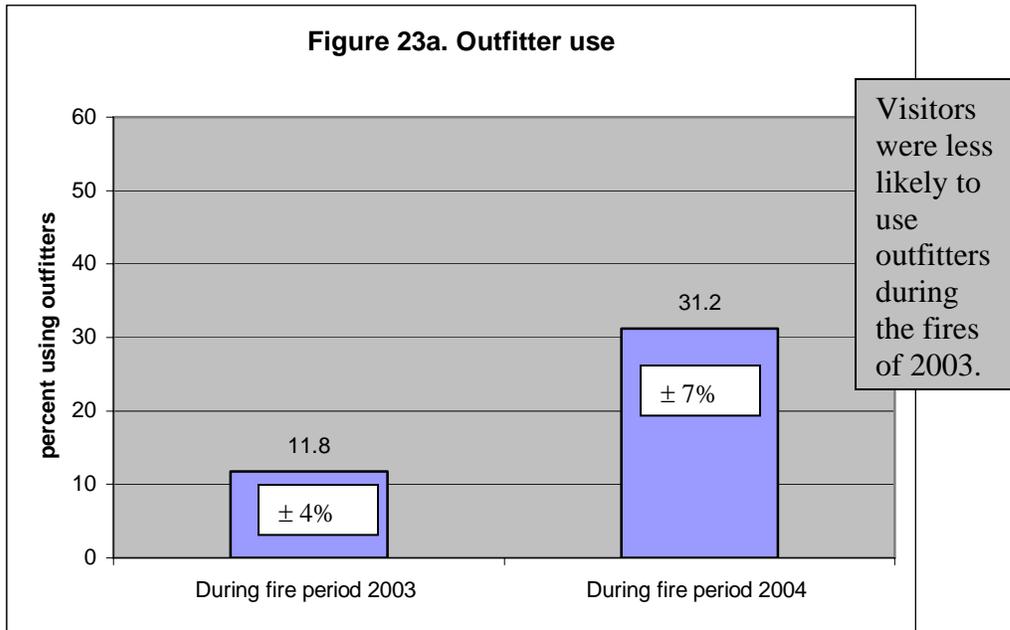


Significant differences for the ‘during fire’ periods were found when length of stay was split by mode of travel.



Outfitter use

Respondents were asked if an outfitter or guide went with them on their trip. No significant differences were found in the 'pre fire' and 'after fire' time period comparisons. Significant differences were found for the percent of visitors using outfitters in the 'during fire' time period comparisons.



Significant differences for the 'during fire' periods were found when outfitted use was split by length of stay and mode of travel.

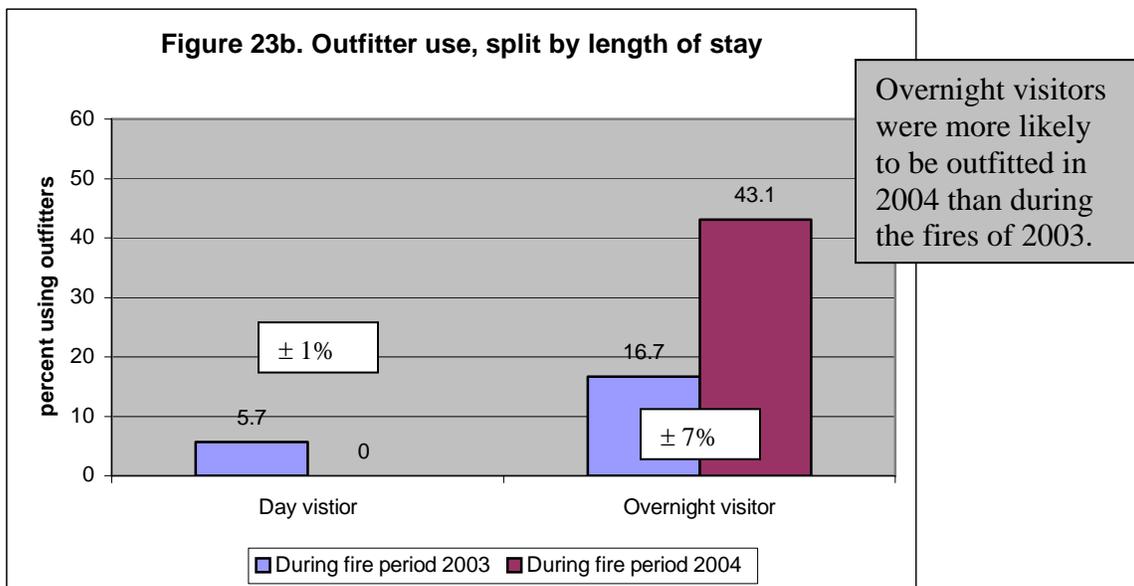
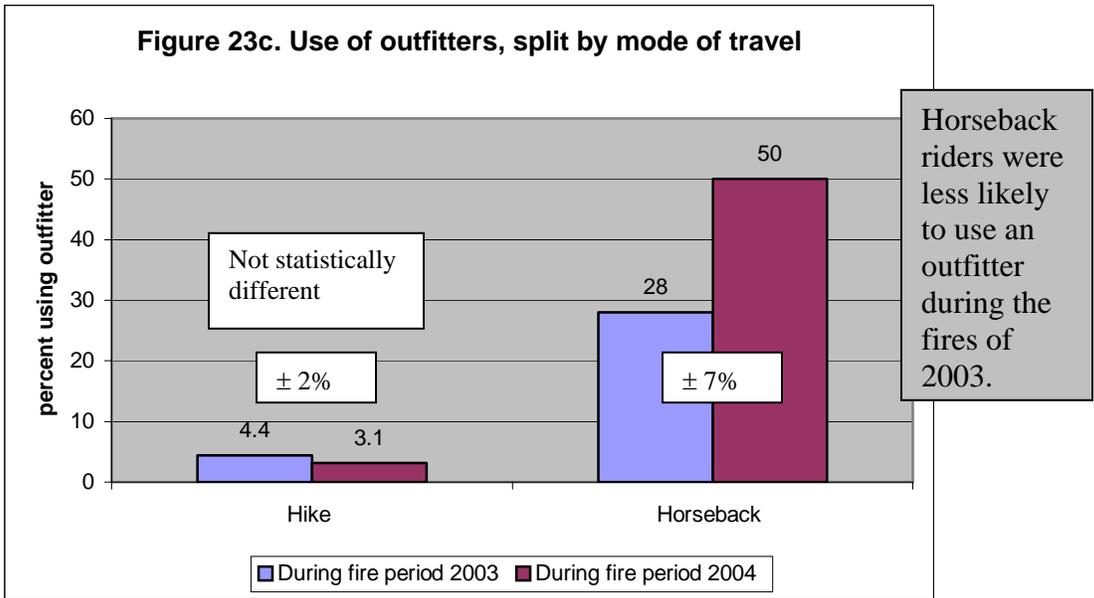
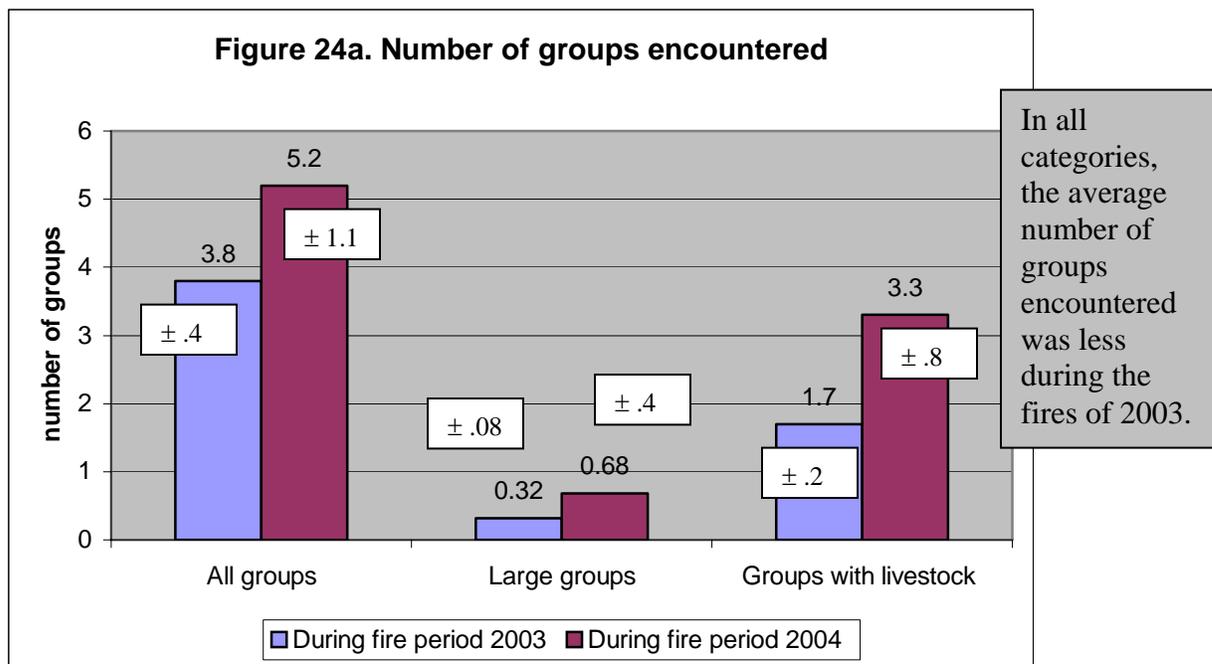


Figure 23c. Use of outfitters, split by mode of travel



Encounters

Respondents were asked how many other groups they saw in the wilderness on the trip about which they were being questioned. They were also asked how many of these were groups of 10 or more people and how many of the groups had horses or other livestock. No significant differences were found in the 'pre fire' and 'after fire' time period comparisons for any of these questions. However, significant differences were found for numbers of encounters in the 'during fire' time periods. No significant differences were found when number of groups encountered was further split by use of outfitter, mode of travel, or length of stay.



What were the differences in visitor attitudes between 2003 and 2004?

Visitors were asked numerous questions about their attitude towards social and physical conditions and management actions. Earlier in this section, it was described that the characteristics of the visitors themselves did not change during the fires of 2003, but the characteristics of their visit did change. Much along this theme, visitors' attitudes showed very few differences between the years. The attitudes that showed significant differences between 2003 and 2004 are presented below. These significant differences were consistent throughout all fire time periods, allowing an overall comparison of the years to be conducted. It is interesting that in the few cases that attitudes changed from 2003 to 2004, the subject of the question had something to do with fire.

Desirability of management actions:

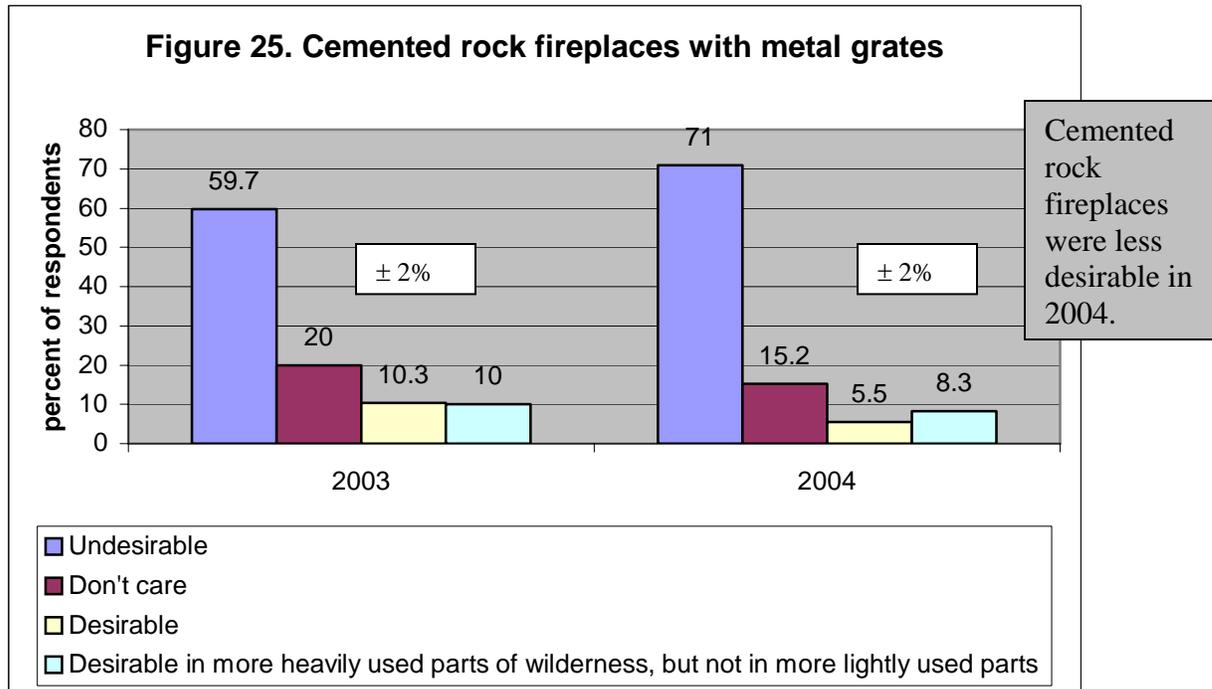


Figure 26. Small, loose rock fireplaces (fire rings)

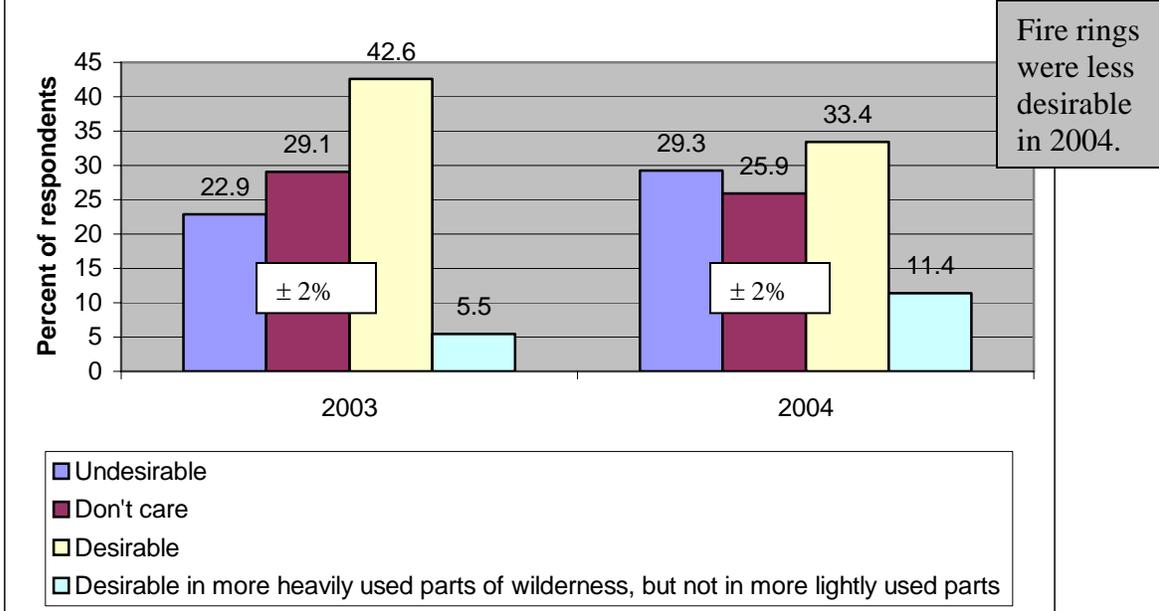


Figure 27. Natural forest fires started by lightning

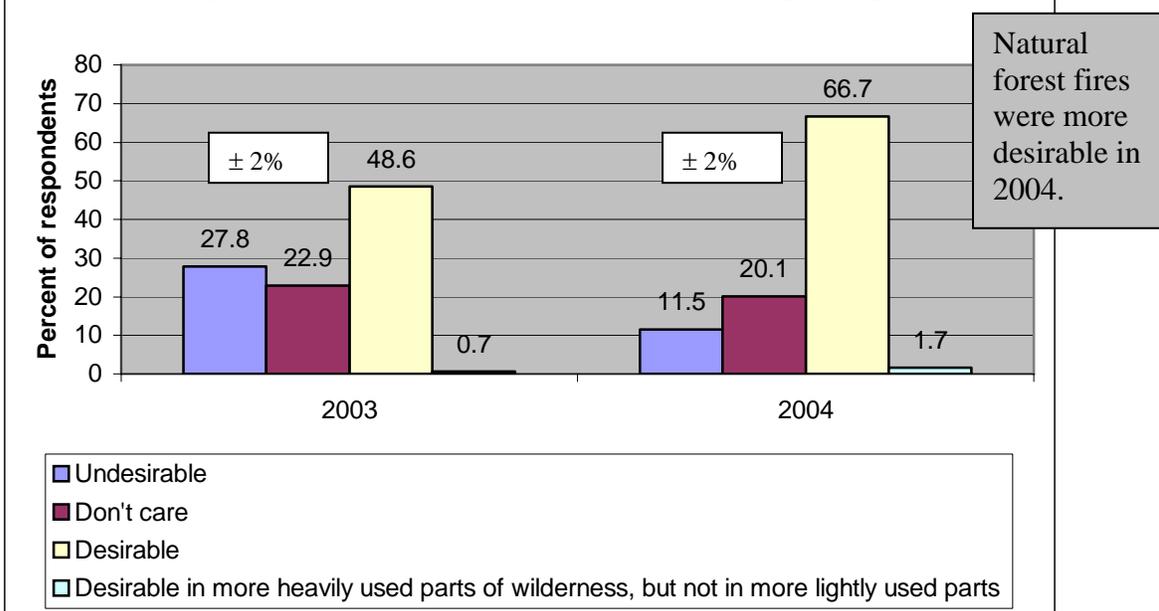
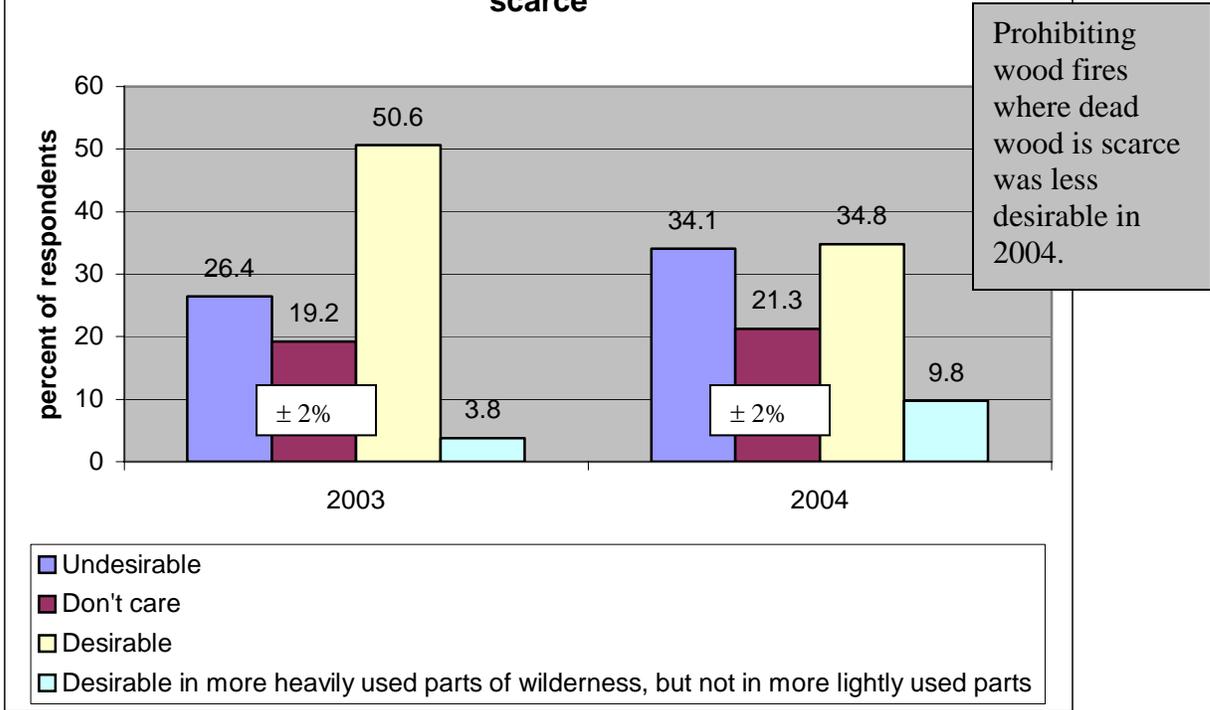
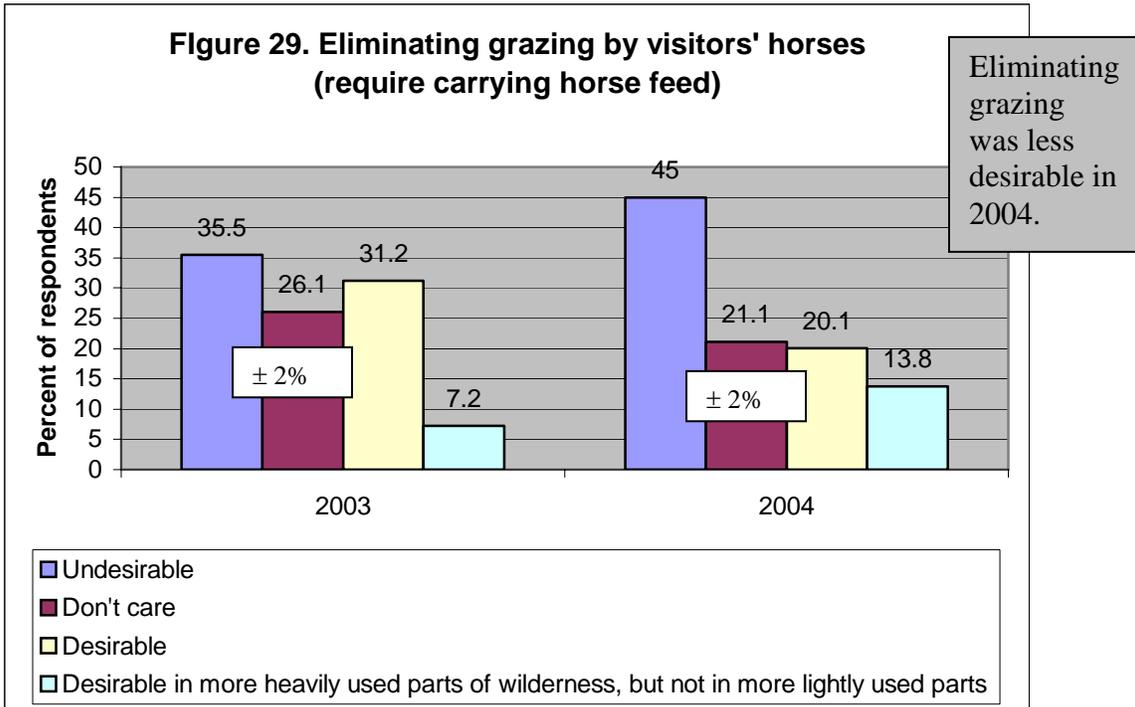


Figure 28. Prohibiting wood fires where dead wood is scarce



The only non-fire related question that showed significant differences between 2003 and 2004 was the elimination of grazing by visitors' horses (require carrying horse feed).

Figure 29. Eliminating grazing by visitors' horses (require carrying horse feed)



Section 3: How have use patterns, visitor characteristics, and attitudes changed since the studies conducted in 1970 and 1982?

About the results:

The fourth objective (listed in section 1) of conducting a visitor study for the BMWC was to compare results to previous studies completed in 1970 and 1982¹ to determine trends in use patterns, visitor characteristics, and attitudes. This section looks at those differences and trends.

To allow an accurate comparison to the previous studies, the questions in the 2004 survey appeared as close to the 1970 and 1982 surveys as possible. In many cases the wording appeared as an exact replica of the previous studies. In a few cases, wording was changed to reflect current usage and understanding; for example, a question about how visitors acquired information from the Forest Service was updated to include the choice of using the internet. A few items that seemed low in priority were not repeated; for example the comparison of usage for the three individual wilderness areas that make up the BMWC was dropped as the area has increasingly been treated as one contiguous wilderness area.

¹ Lucas, Robert C. Visitor characteristics, attitudes, and use patterns in the Bob Marshall Wilderness complex, 1970-82. Research Paper INT-345. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station; 1985. 32p.

The method of sampling also remained as close as possible to the 1970 and 1982 studies. Descriptions of the exact sampling procedures are listed in section 1. A summary of mail response rates is listed below. A decline in response rate is expected over the years, and in 2004 a response rate of 72% is considered very good.

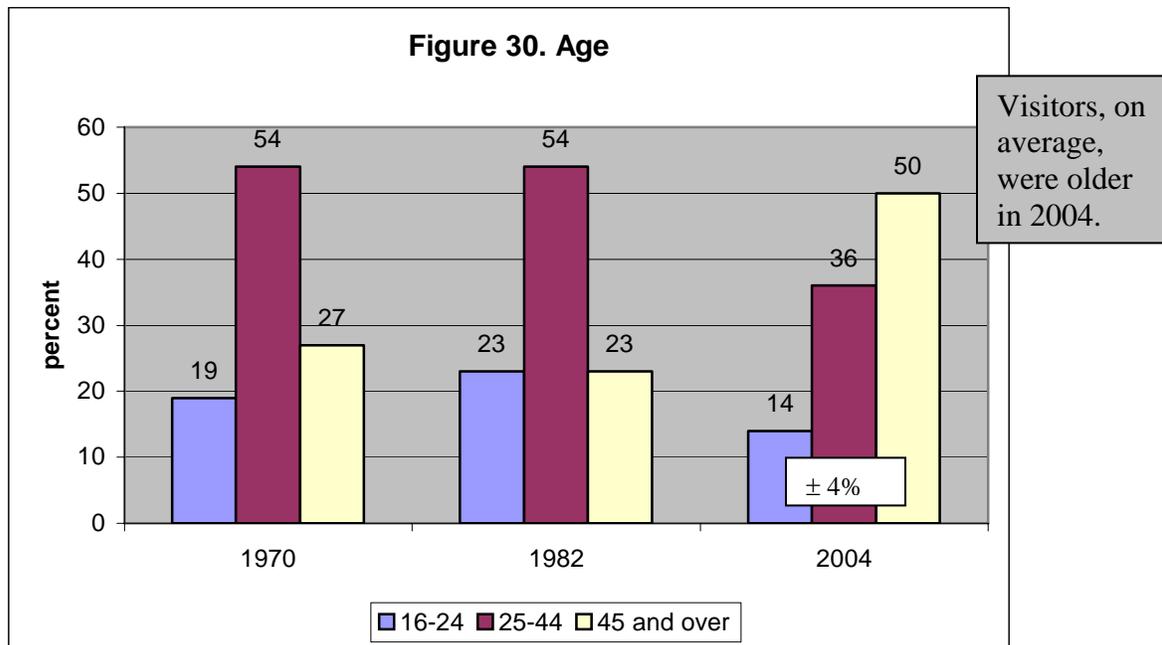
Year	Number of Questionnaires mailed	Completed and returned	Percent returned
1970	552	502	91%
1982	972	785	82%
2004	408	294	72%

How have visitors to the BMWC changed over the years?

Confidence intervals are included for the 2004 data. Confidence intervals for the 1970 and 1982 data are included when known. We can say with 95% confidence that the means and percentages shown are within the ranges given.

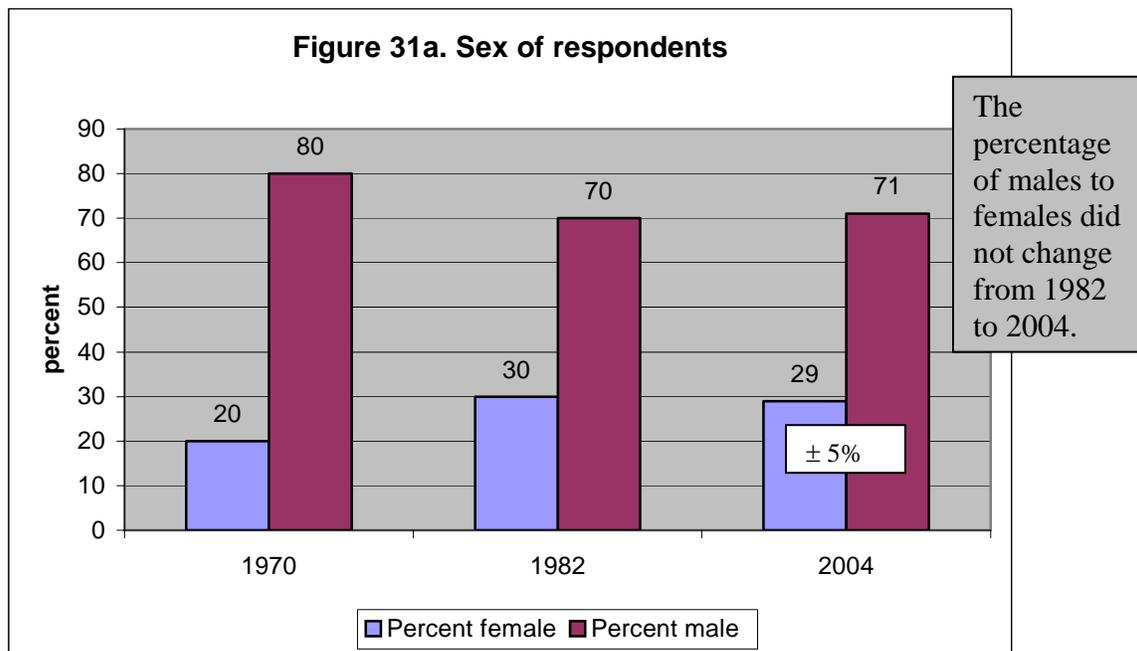
Age:

There did not appear to be a difference between the ages of visitors of 1970 and 1982, however 2004 did yield a significant change in age structure. (Age categories were changed from those appearing earlier in this report to match those of the previous studies.)



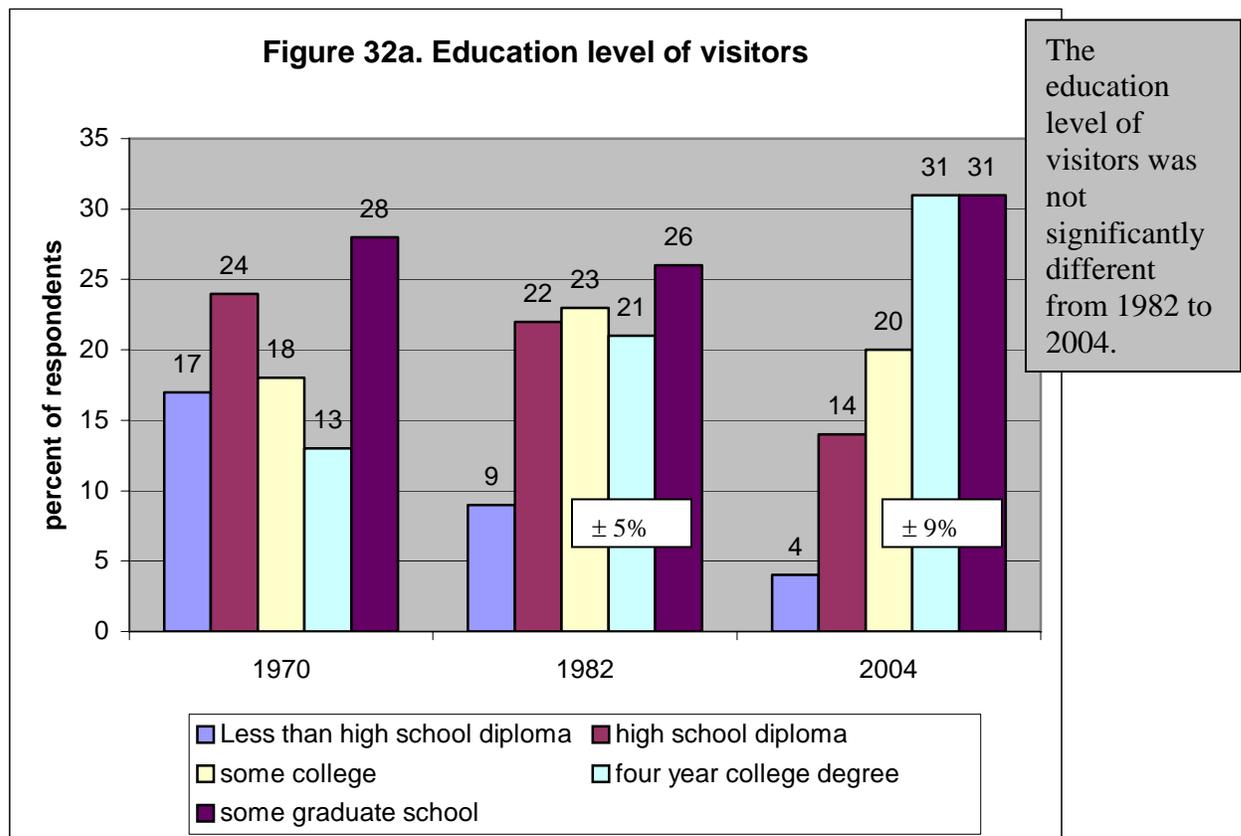
Sex:

Most visitors are male among all three studies. The proportion of female visitors grew from 20 percent in 1970 to 30 percent in 1982. In 2004 the proportion of females was not significantly different than in 1982.



Education:

Education levels of 2004 were significantly different from 1970, indicating that visitors have become more highly educated. However, there was no significant difference between 1982 and 2004.



Place of residence

In all studies, more than half of the visitors to the BMWC were from Montana. Overall, place of residence has not significantly changed over the years. However, a significant difference was found in the proportion of out of state visitors when split by mode of travel.

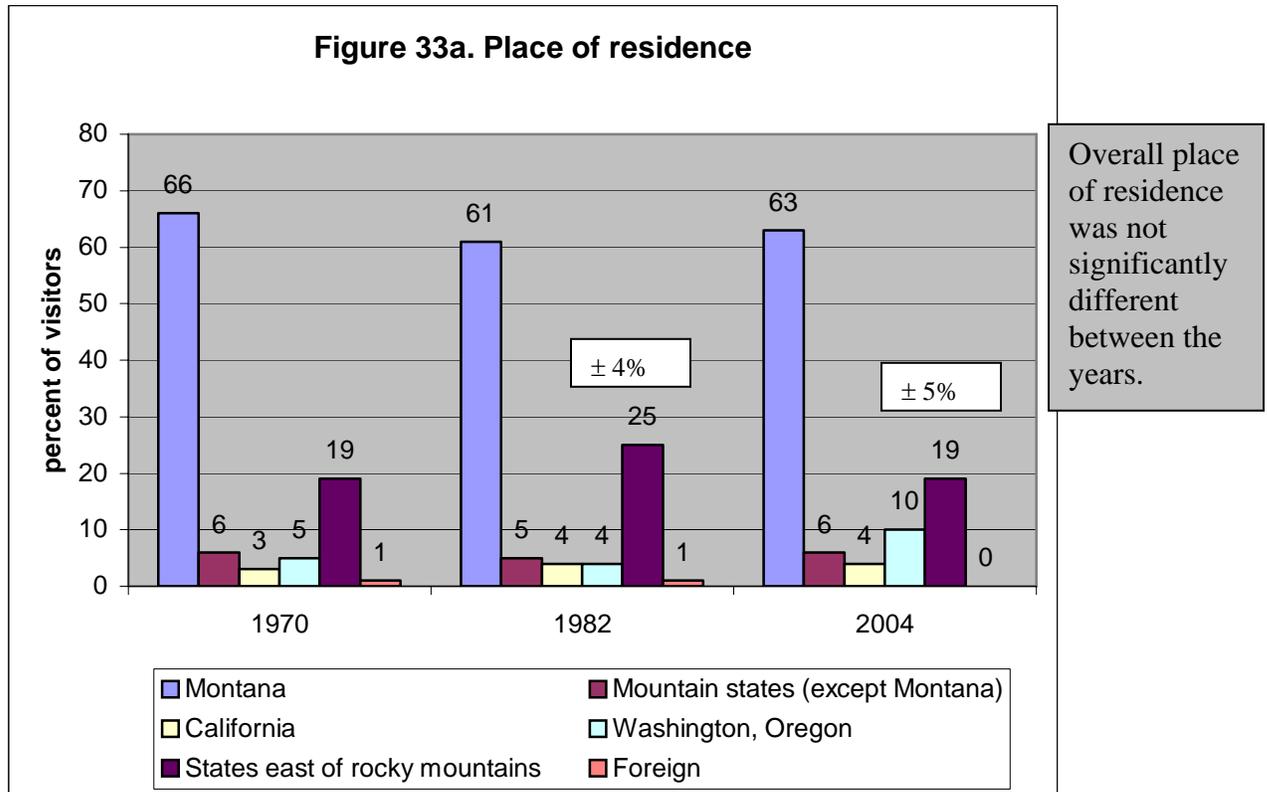
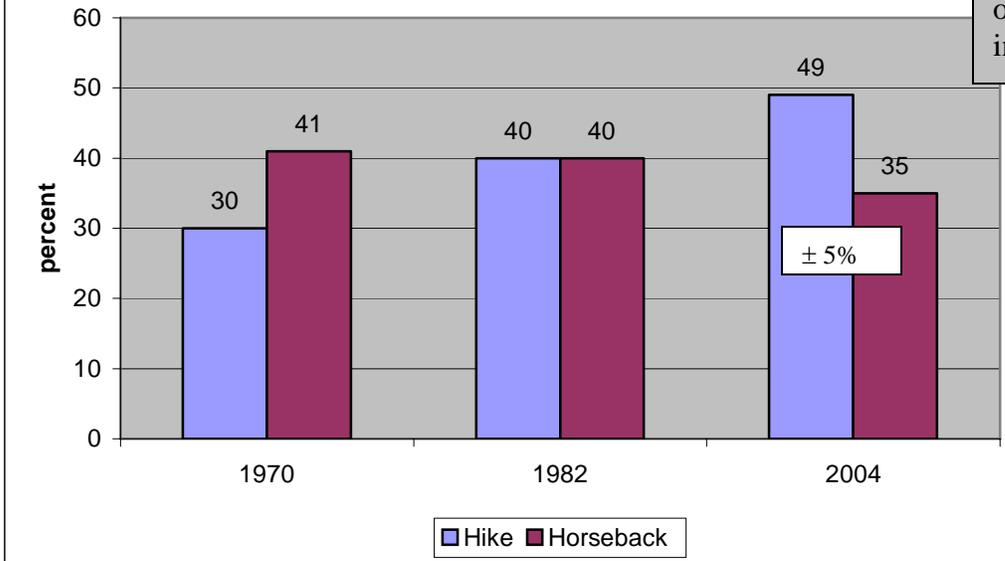
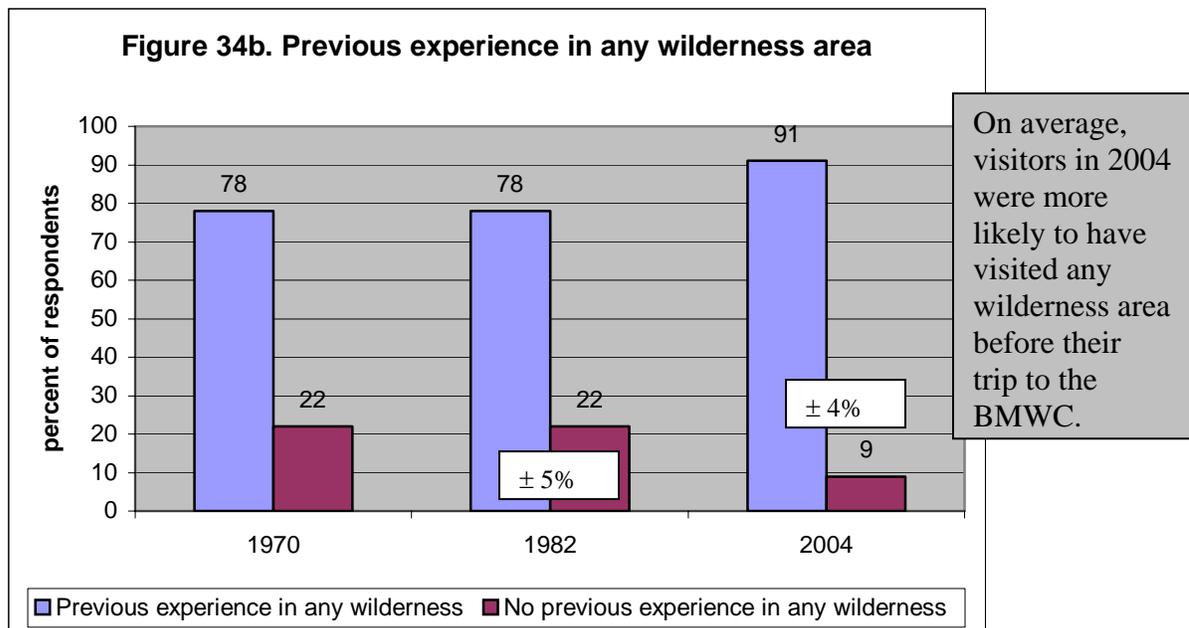
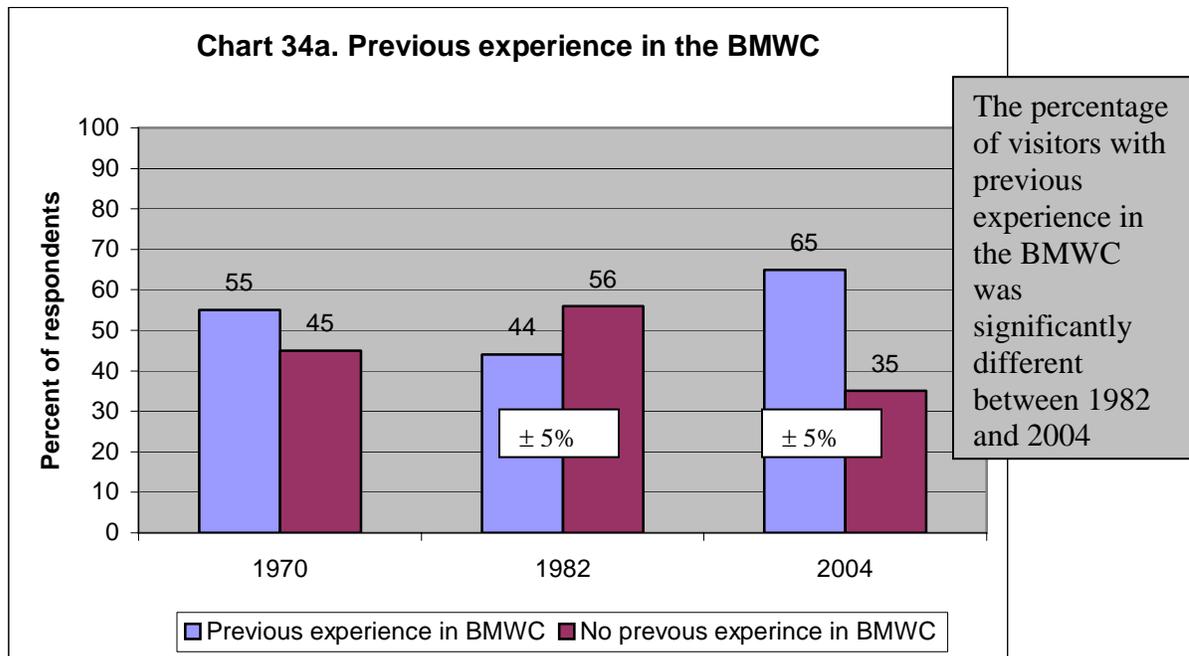


Figure 33b. Percent of visitors from out of state, split by mode of travel

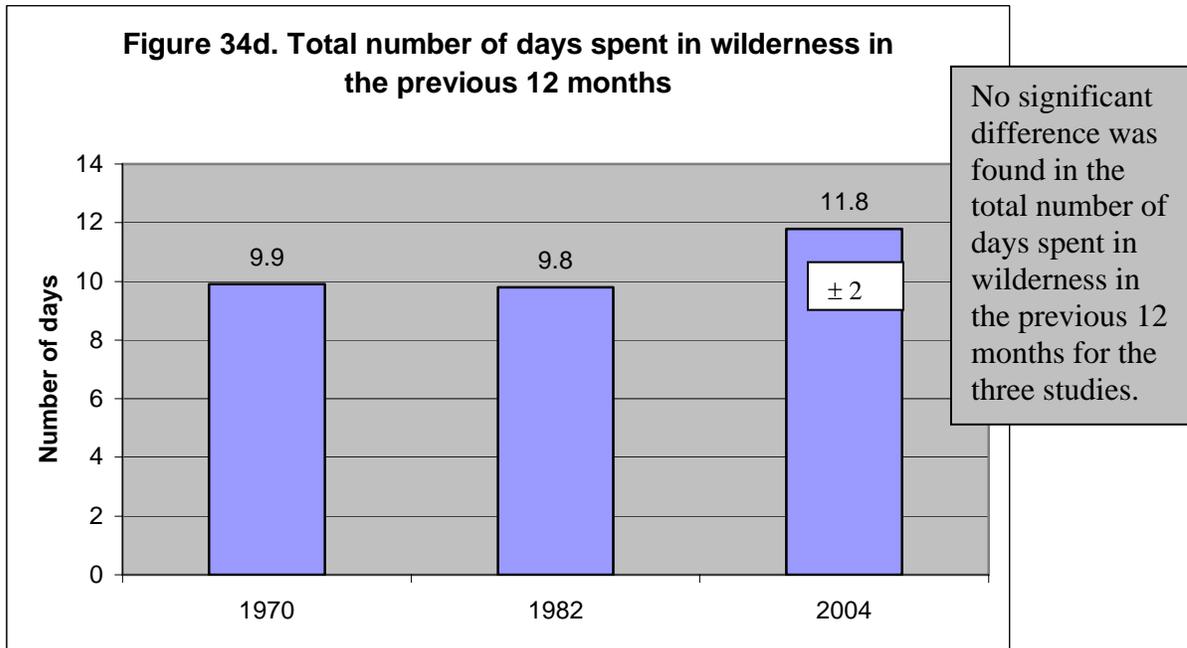
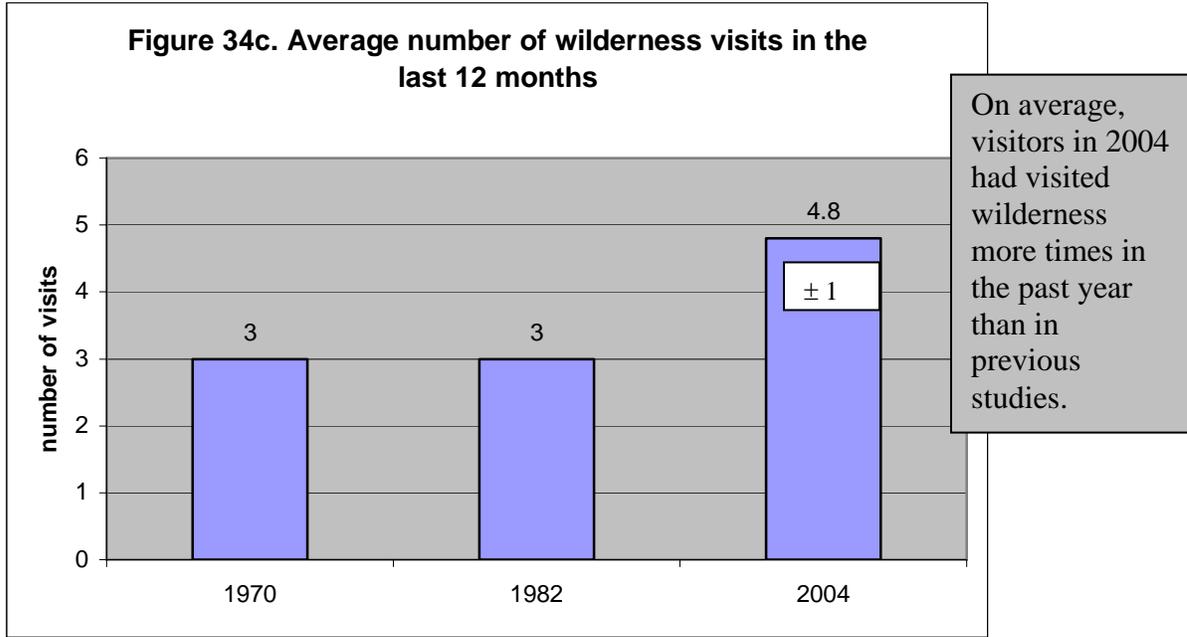


Previous experience

Significant differences were found in the proportion of visitors with previous experience in the BMWC in 2004 compared to 1982. The proportion of visitors with previous experience in any wilderness was also significantly greater in 2004.

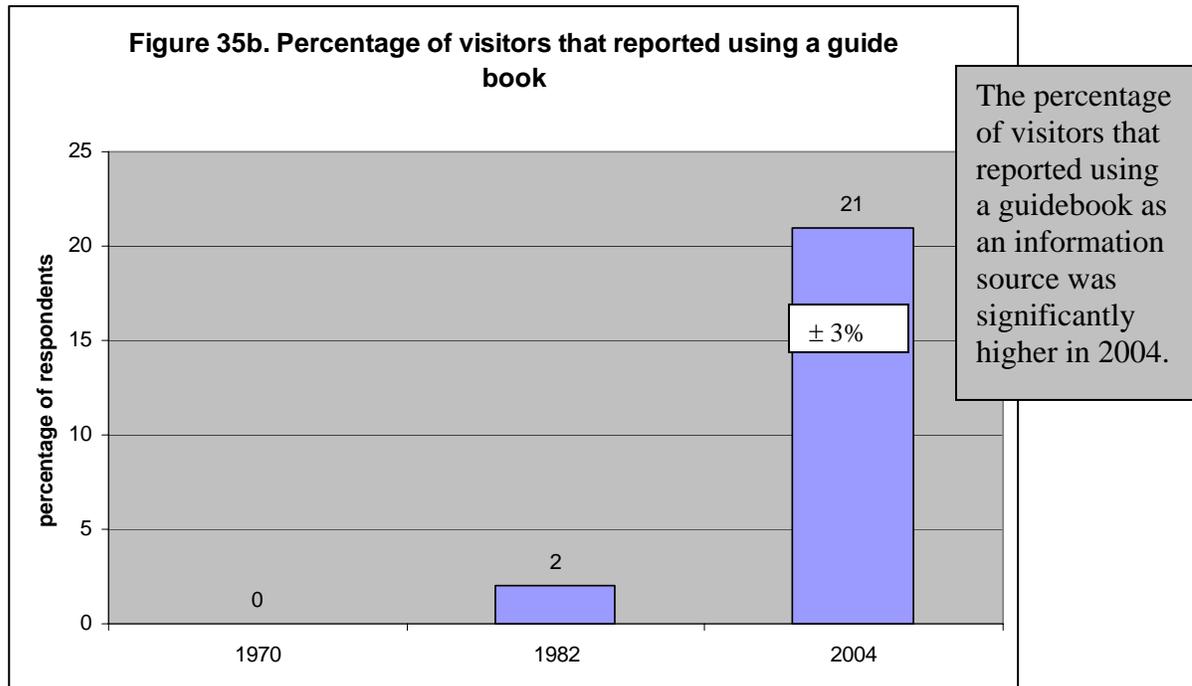
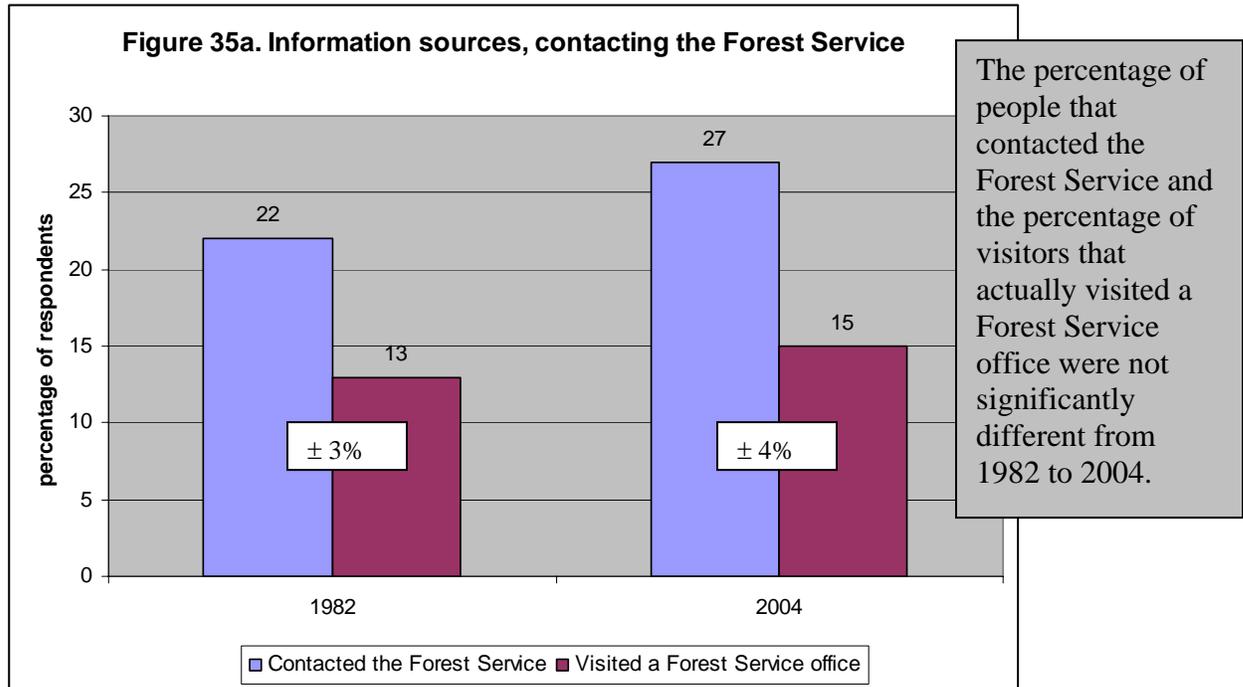


The average number of wilderness visits in the previous 12 months was found to be significantly different in 2004, however the total number of days spent in wilderness over the previous 12 months although, on average, higher in 2004, was not found to be different from 1970 to 1982.



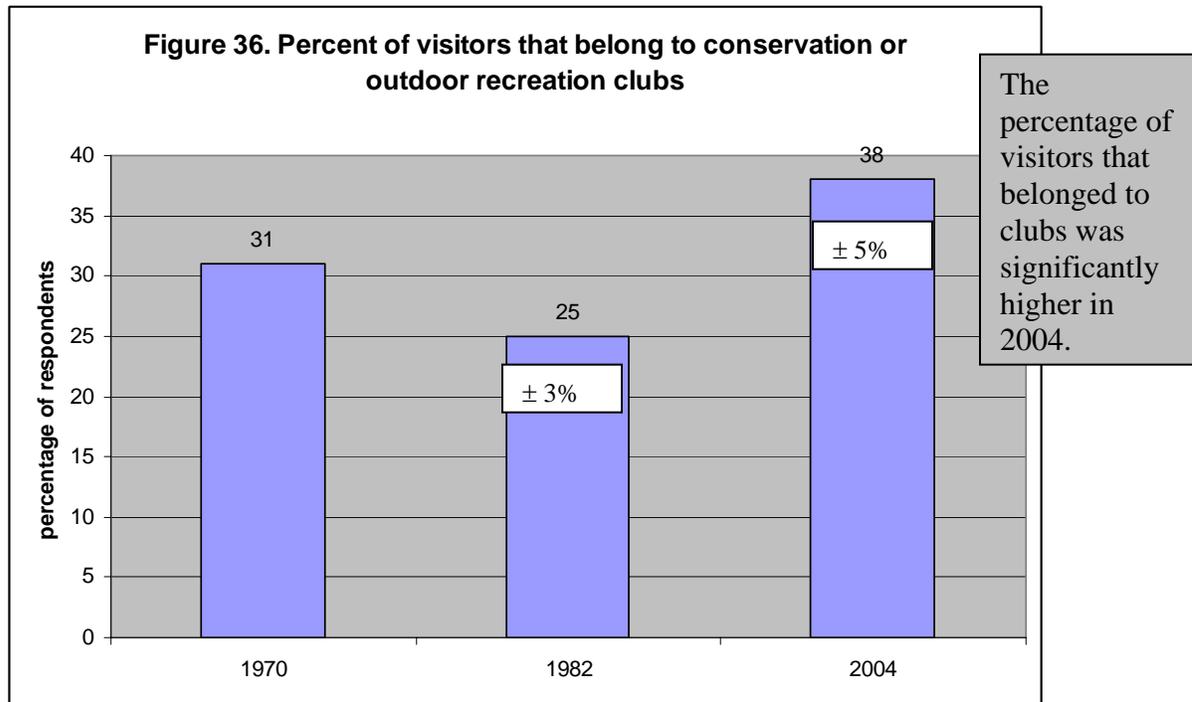
Information Sources

Visitors were asked to indicate how or where they obtained information about the wilderness before their trip. In 1982, visitors were asked if they contacted the Forest Service in person, by telephone, or by writing. This question was not asked in 1970. In 2004 the option of contacting the Forest Service by e-mail was added.



Club membership

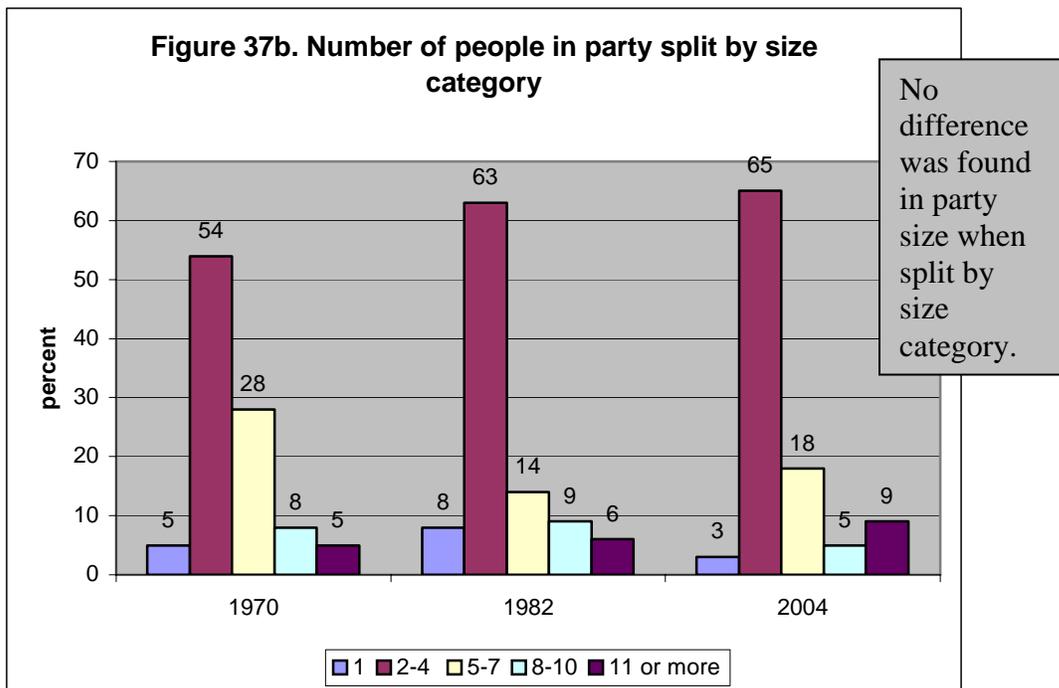
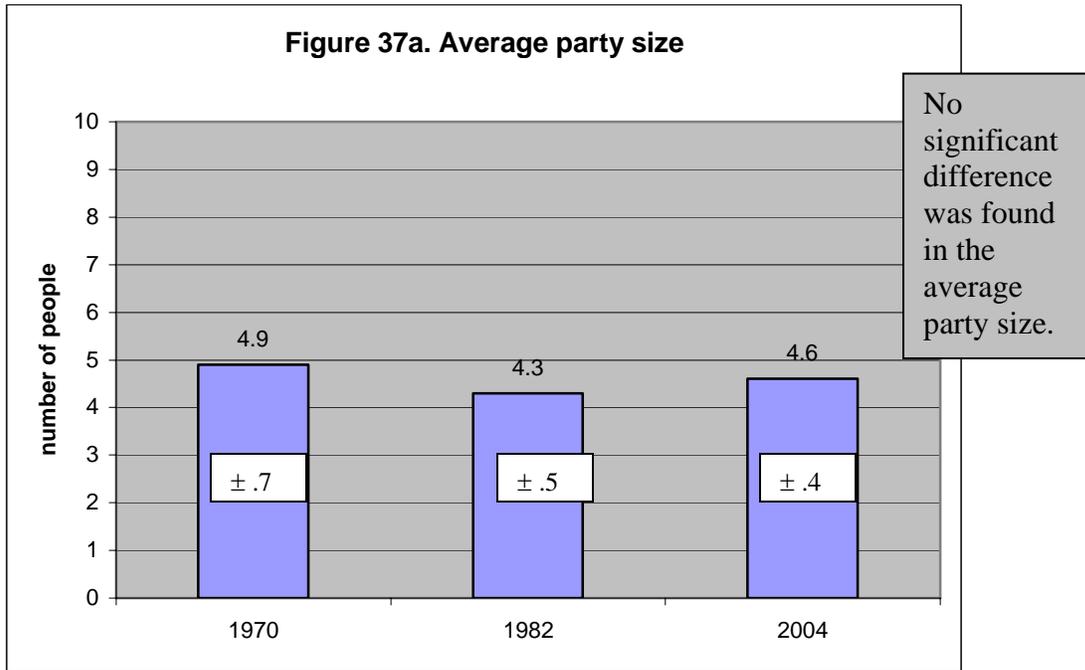
Visitors were asked if they belonged to any conservation or outdoor clubs.



How have visit characteristics changed over the years?

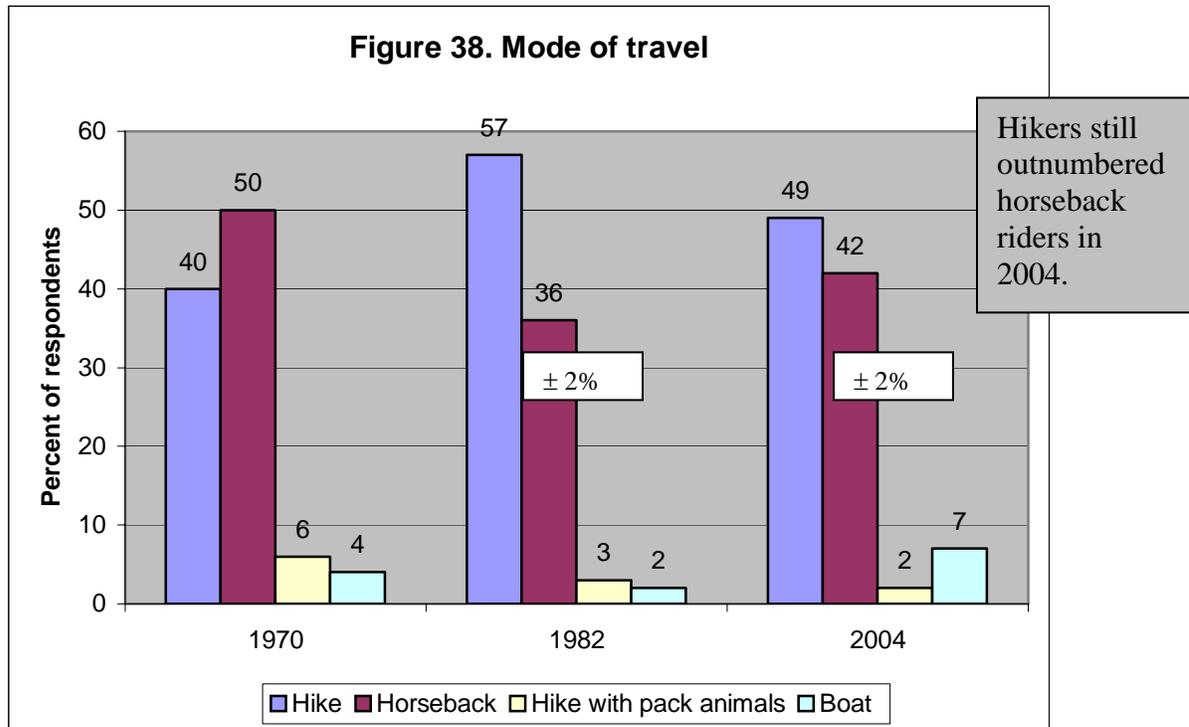
Party size

No statistical difference was found for average party size or proportion of visitors in party size categories.



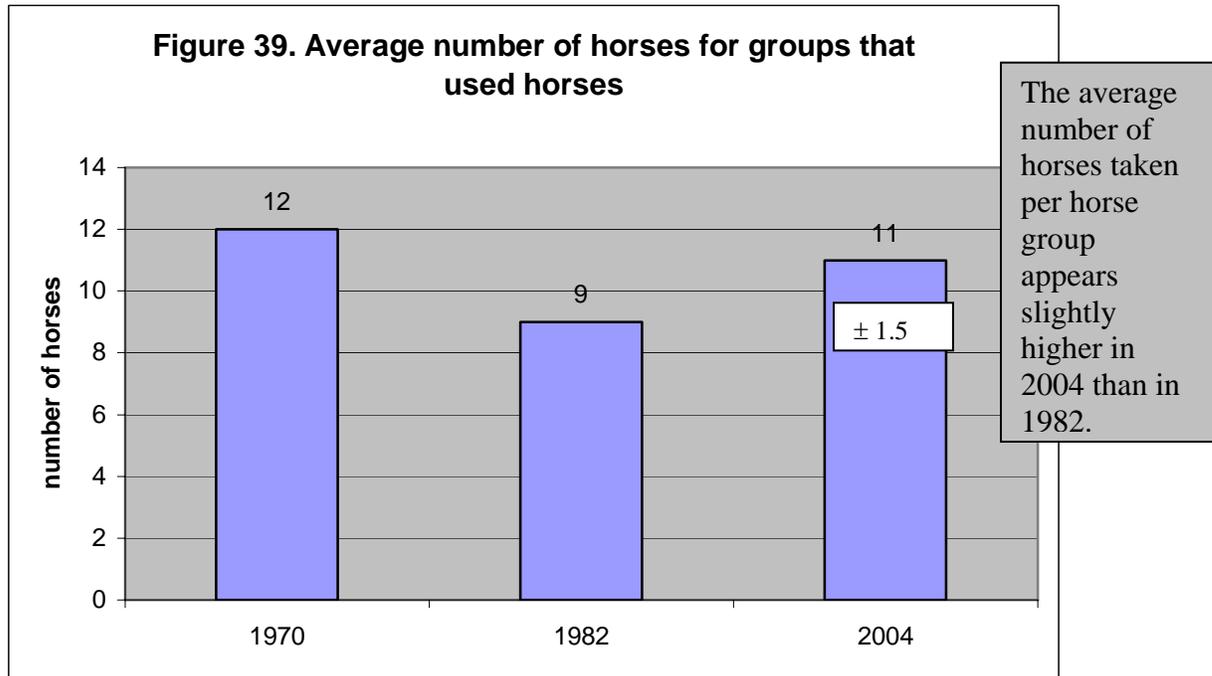
Mode of travel

In 1982, visitors were more likely to be hikers than horseback riders. This was opposite of the findings of the 1970 study. In 2004, hikers still outnumbered horseback riders, but the proportions were closer together.



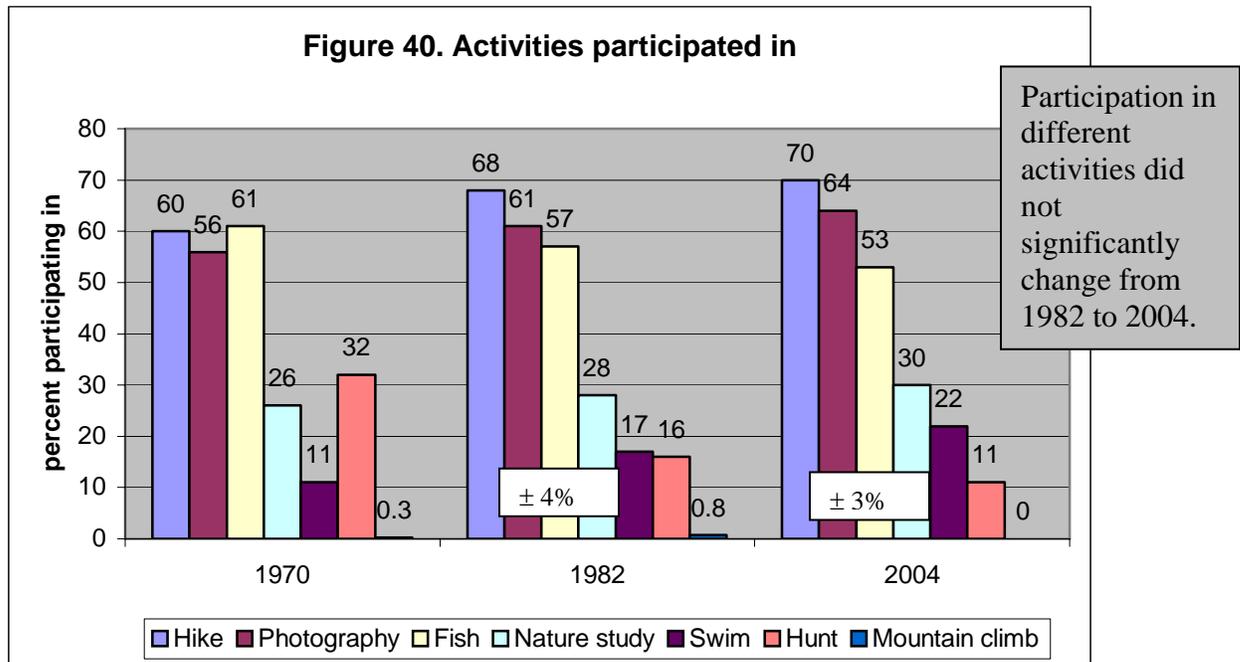
Number of livestock

After a drop in average number of horses taken per horse group from 1970 to 1982, the number rebounded in 2004.



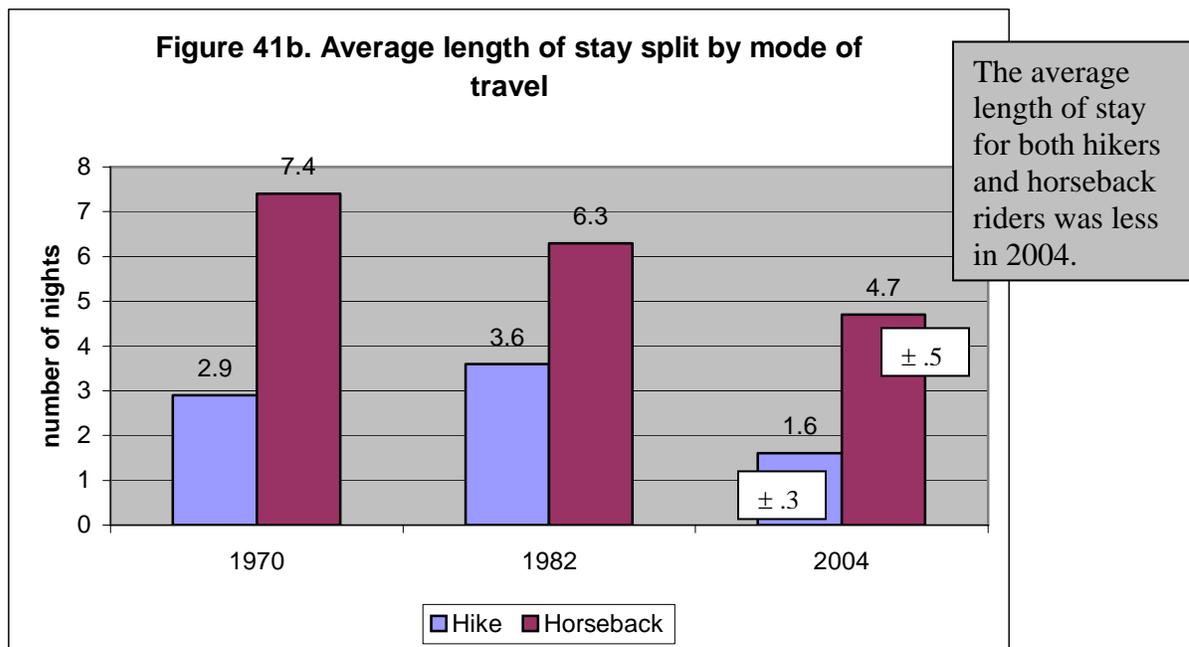
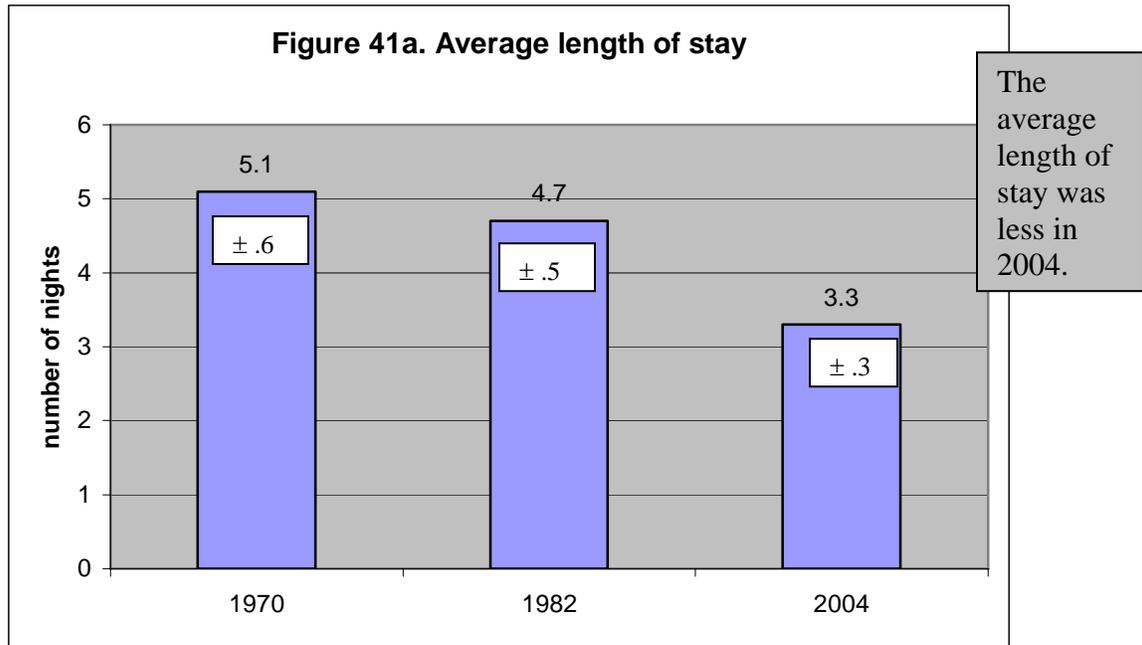
Activities

Participation in various activities was not significantly different between 1982 and 2004.



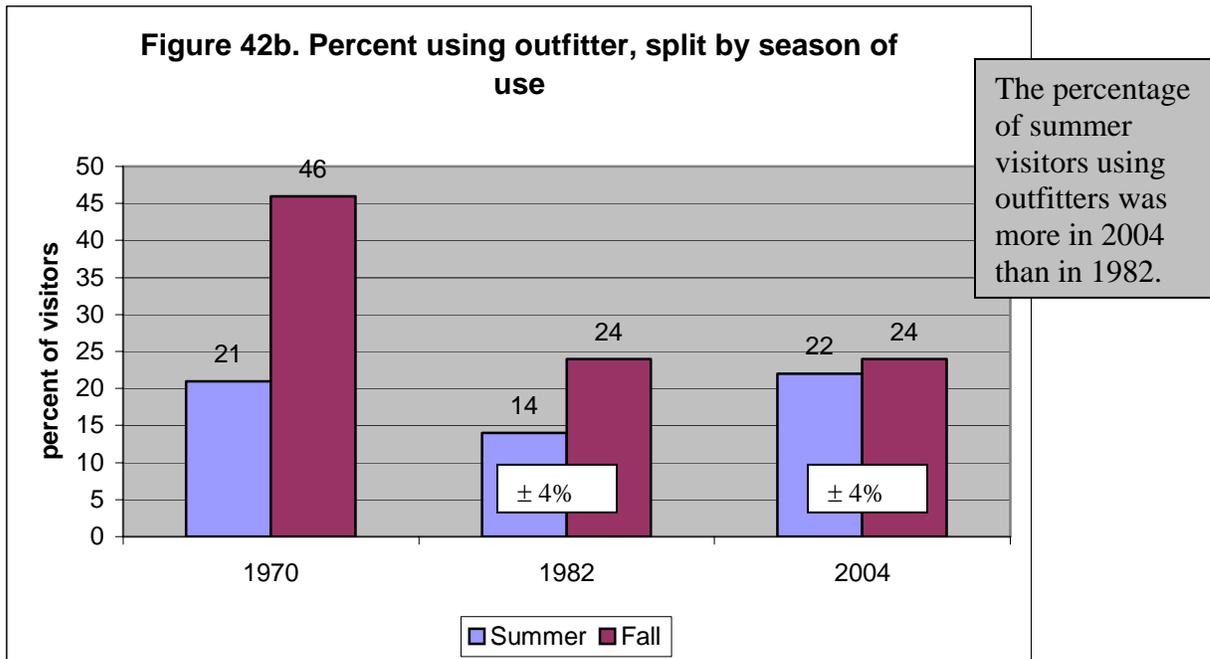
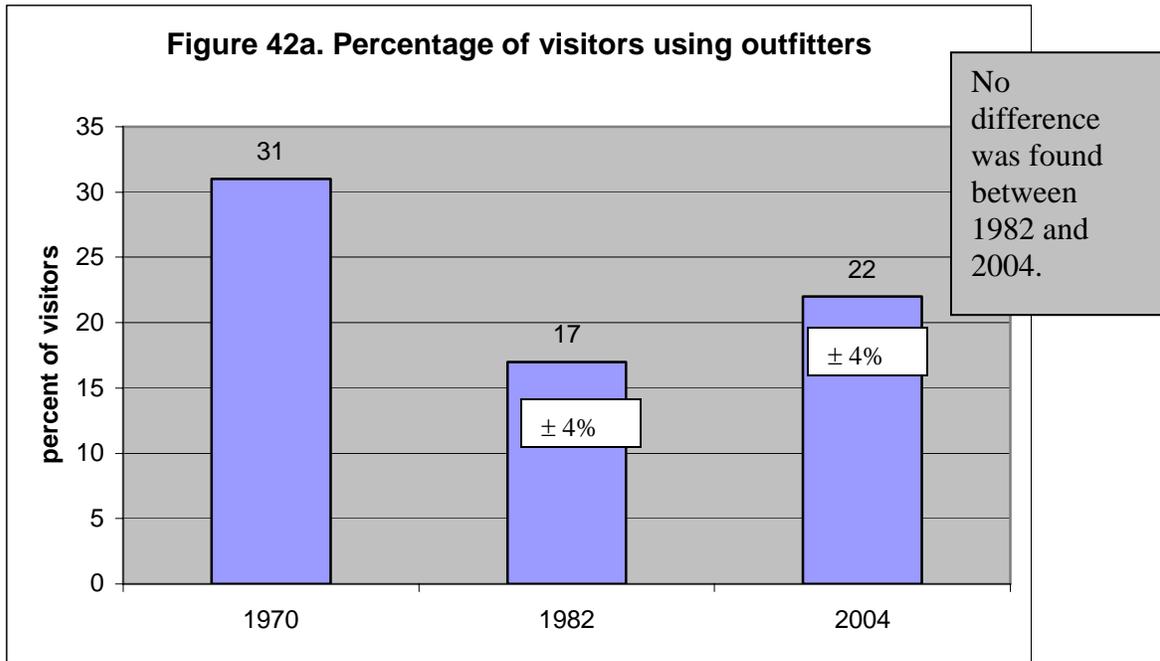
Length of stay

The average length of stay was significantly different between each year and is on the decline. The average length of stay for both horseback riders and hikers was less in 2004 than in 1982.



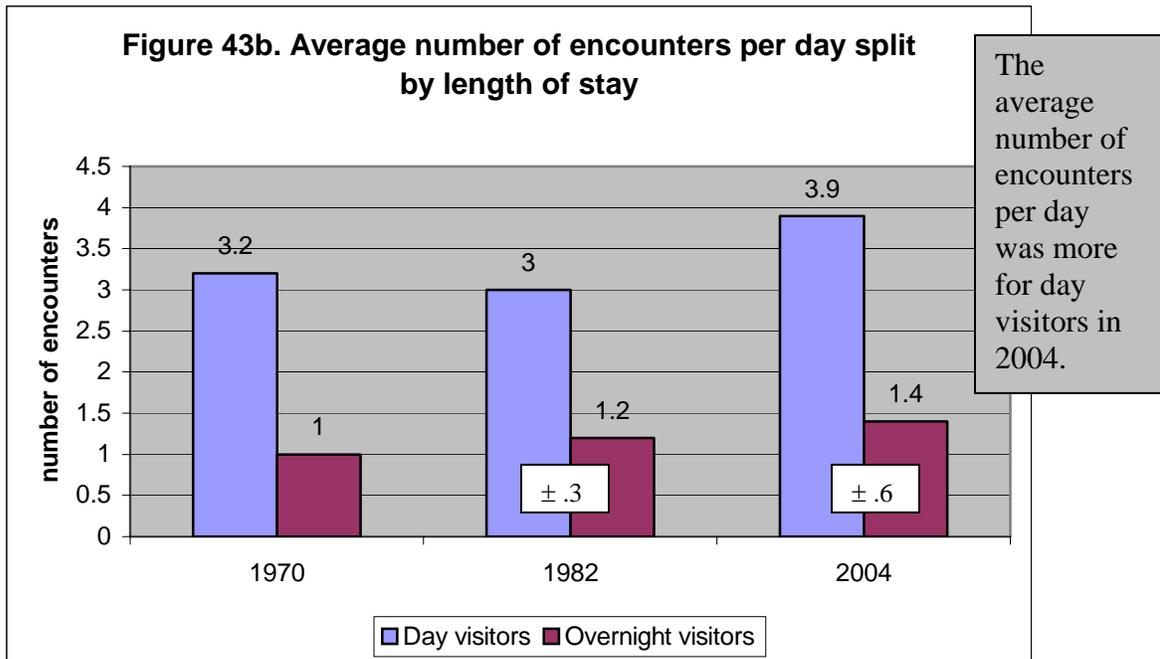
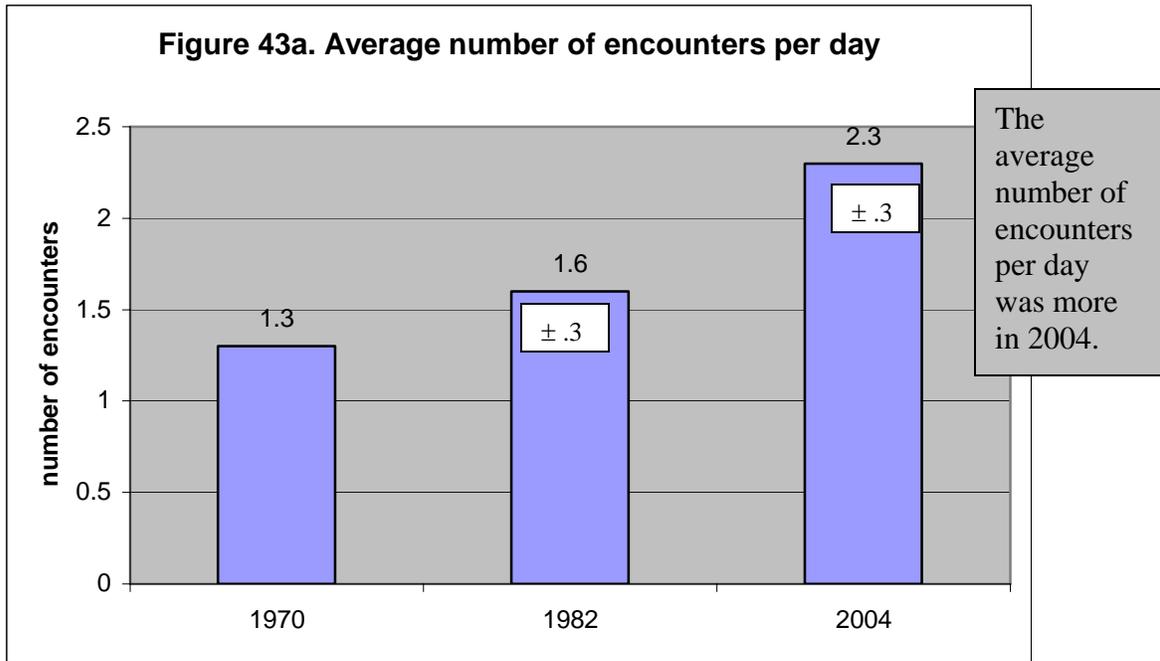
Outfitter use

The overall percentage of visitors using outfitters was not significantly different between 1982 and 2004. When split by season of use, the percentage of summer visitors using outfitters was significantly different.



Encounters

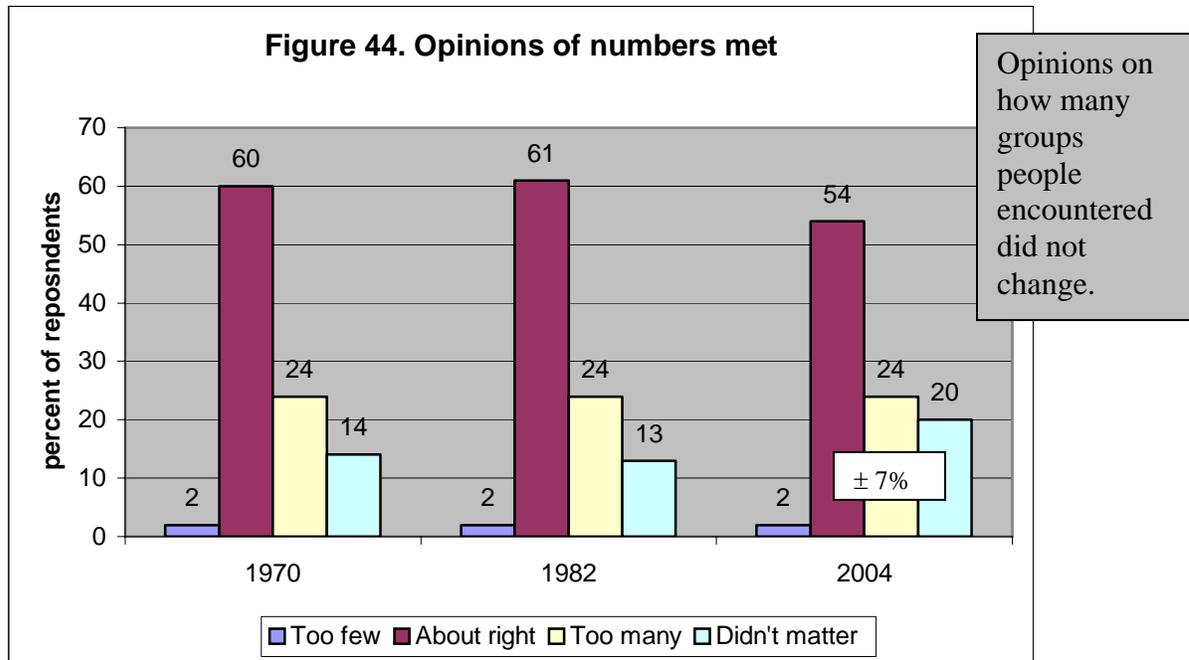
The average number of encounters per day was significantly different between 1982 and 2004. When split by length of stay, the average number of encounters was significantly different for day visitors but not for overnight visitors.



How have visitor attitudes changed over the years?

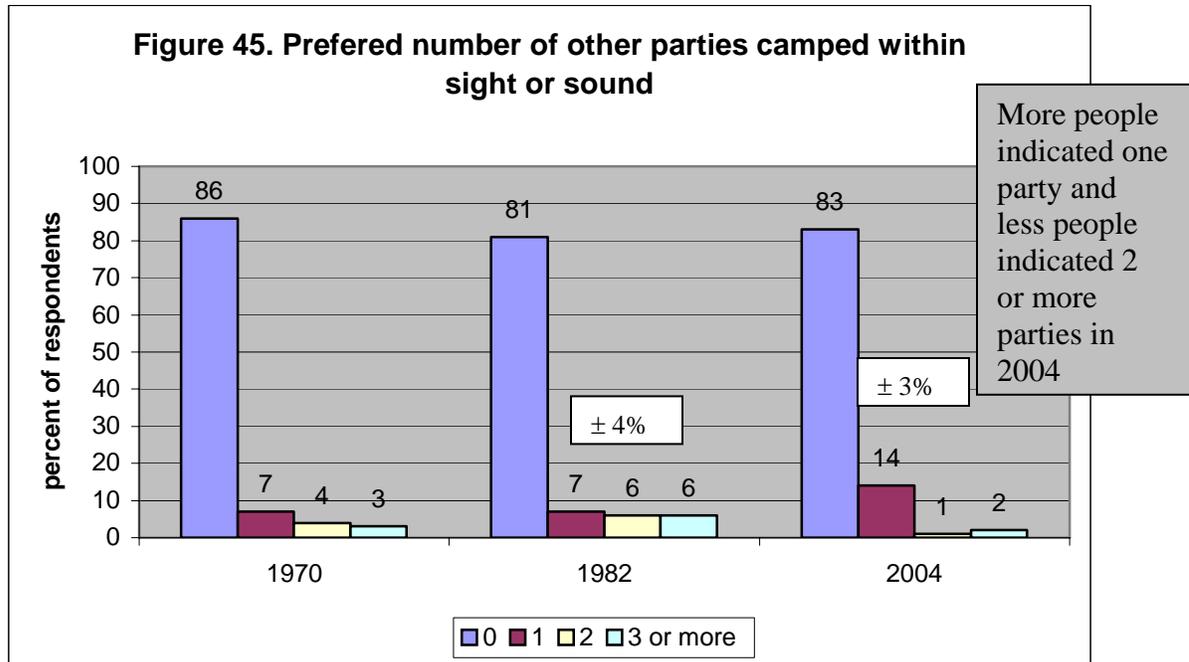
Encounters

Following the questions about the number of encounters with other groups, visitors were asked about how they felt about the number of groups they encountered. The options were; saw way too few, saw too few, about right, saw too many, saw way too many, and did not matter to me one way or another. The two options for too few and the two for too many were added together for this analysis. No significant difference was found between the years.



Campsite conditions

Visitors that stayed overnight were asked how many other parties they would prefer to be camped within sight or sound of their camp. Although the percentage of visitors that responded with a zero was about the same as previous years, the other categories were significantly different.



Perceived change in area quality

Visitors that had visited the BMWC before, were asked to indicate if they thought that the quality of the area was getting better, was about the same, or was getting worse. After a change from 1970 to 1982, there was no significant difference between 1982 and 2004.

