

PACK TO BACK:

INVESTIGATING BACKPACKING AND OTHER BACKCOUNTRY
AND WILDERNESS ACTIVITIES

MEET THE SCIENTISTS!

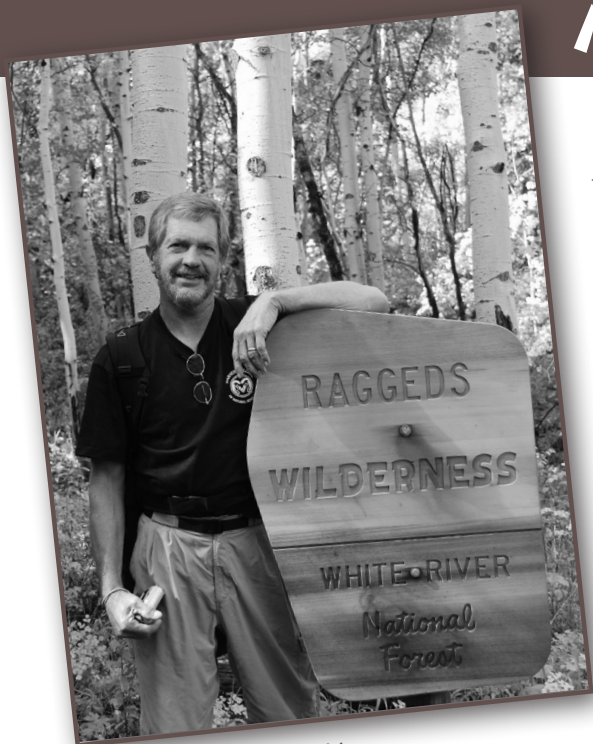


Photo by Babs McDonald.

◀ Dr. Ken Cordell, Social Scientist

My favorite research experience was conducting a national survey of recreationists from all across the United States. I learned much from this survey about the diversity of activities people enjoy outdoors. This photo was taken while I was hiking in Colorado (figure 1).

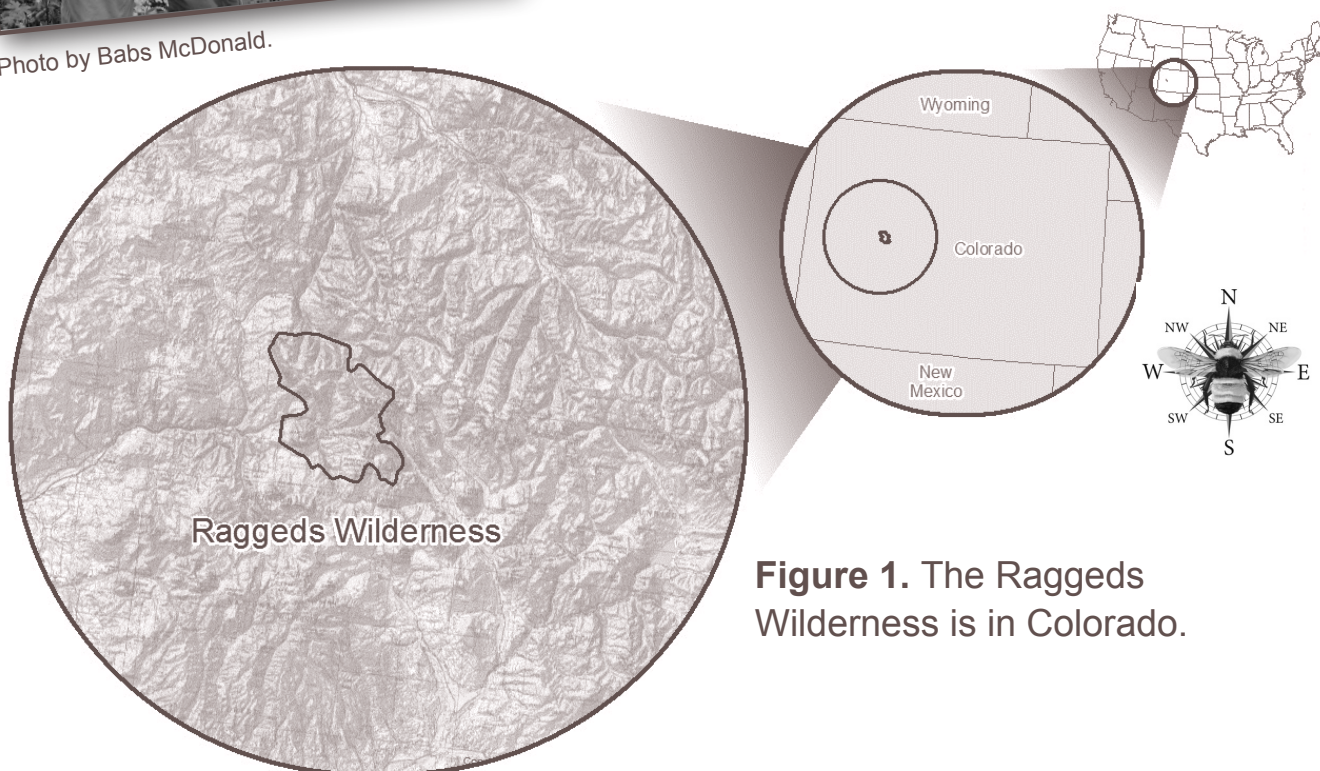


Figure 1. The Raggeds Wilderness is in Colorado.

► **Dr. Michael Bowker,
Social Scientist**

My favorite science experience was working on understanding the users of Georgia's State parks. State parks are similar to national parks but are smaller and are operated by each State on behalf of the State's citizens and visitors. This photo was taken while I was hiking in New Zealand. New Zealand is in the Southern Hemisphere (figure 2).



Photo by Colin Bowker.

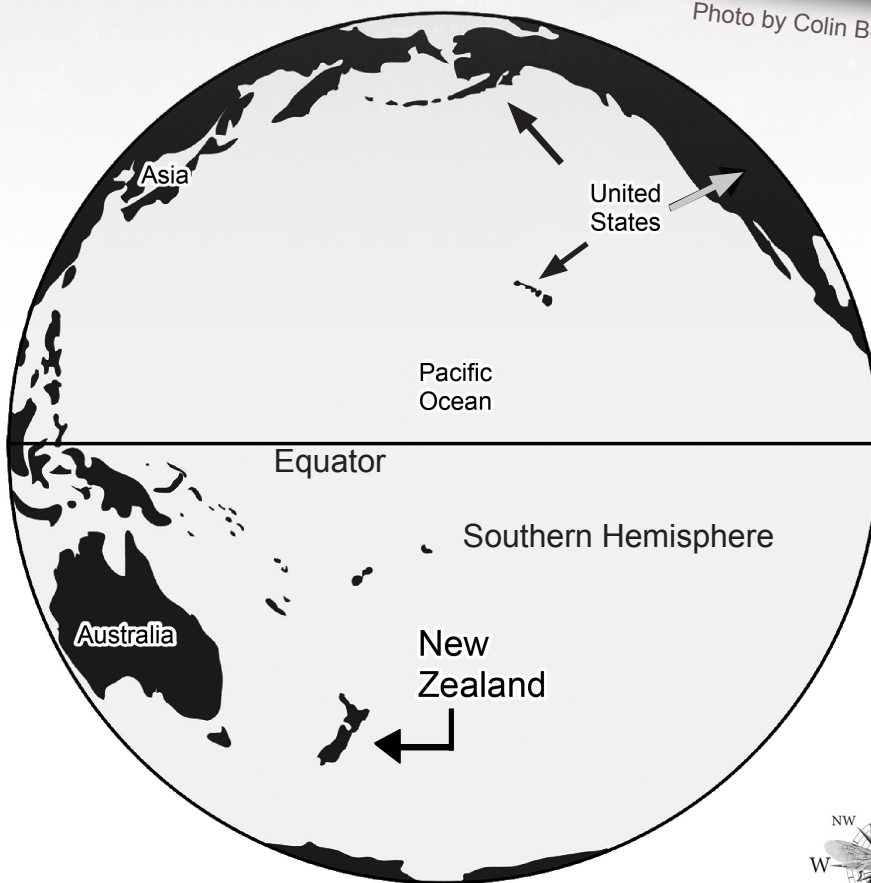
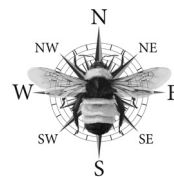


Figure 2. The Southern Hemisphere is the area of Earth south of the Equator. New Zealand is in Earth's Southern Hemisphere in the western Pacific Ocean.



What Kind of Scientist Did This Research?

social scientist:

This scientist studies human societies and human behaviors.



Thinking About Science

Science is important to human society. Because humans are curious, they have always tried to explain things that are not easy to understand. Scientists explore mysteries from the depths of the ocean to outer space. Sometimes scientists work to describe, understand, or explain what they have observed. Sometimes scientists unexpectedly discover new information, facts, or events.

One goal of science is to discover new relationships or things. Another goal is to explore what happened in the past. Still another science goal is to **project** what might happen in the future. In this research, the scientists were interested in how humans might behave differently in the future. When science helps us to understand what might happen in the future, we can plan for a better future.

Thinking About the Environment

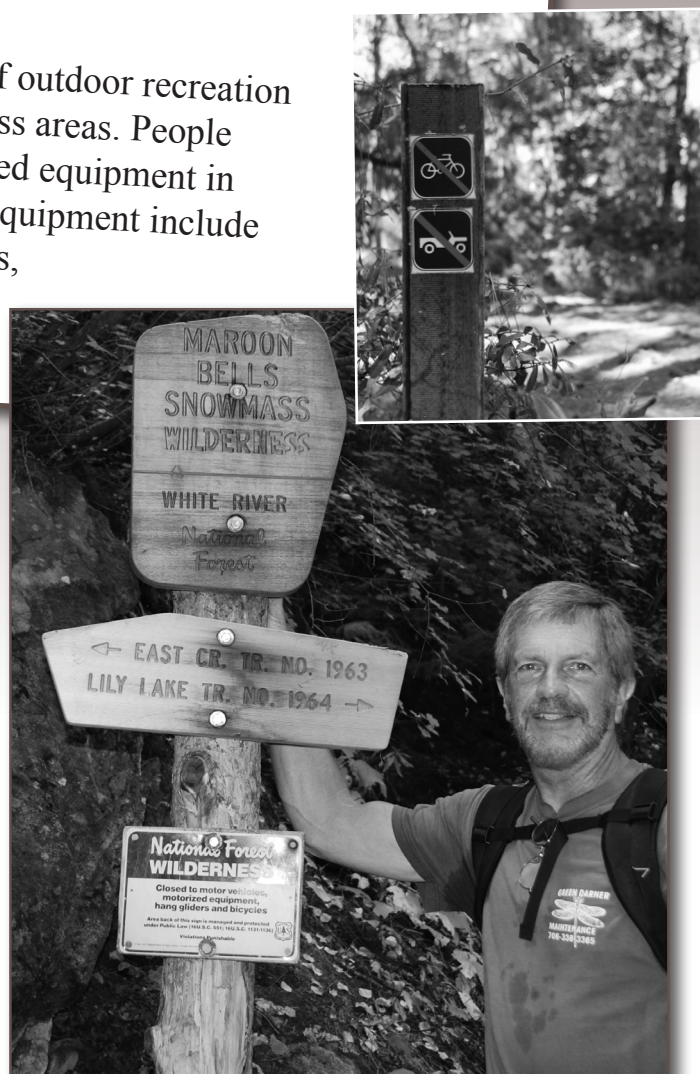
Do you know the difference between a backcountry area and a wilderness area? These two areas are similar in many ways. One of the main differences between them has to do with a legal designation (figure 3).



Backcountry areas are natural primitive areas, with little more than trails and unpaved roads among their natural wild features. Backcountry areas may sometimes include human developments (figure 4). Wilderness areas are special backcountry areas. Wilderness areas designated under the Wilderness Act of 1964 are Federal lands. The Federal Government manages these lands on behalf of every American. These Federal lands are a part of the U.S. National Wilderness Preservation System (NWPS). When an area becomes a part of the NWPS, certain activities are prohibited. Most notably, no motorized or mechanized equipment or human developments are allowed in designated wilderness areas.

People often participate in the same kinds of outdoor recreation activities in backcountry areas and wilderness areas. People may, however, use motorized and mechanized equipment in backcountry areas. Examples of motorized equipment include all-terrain vehicles (ATVs), off-road vehicles, bicycles, airplanes, snowmobiles, and motorboats.

Figure 3. Dr. Cordell had already hiked a few miles in the White River National Forest before reaching the boundary between national forest backcountry and Maroon Bells Snowmass Wilderness in Colorado. Notice the small sign at the bottom of the post. This sign tells visitors that motorized equipment, including bicycles, are prohibited in wilderness areas. If you were riding on an ATV and came to the wilderness boundary, what would you need to do? In some wilderness areas, you might see a sign like the one in the smaller photograph.



Photos by Babs McDonald.



Figure 4. Backcountry areas, unlike wilderness areas, may have human developments, and people may use motorized and mechanized equipment within backcountry areas. Photo courtesy of Forest Service, Northern Region.

When doing research to understand the future of certain types of outdoor recreation activities, the scientists in this study identified activities that could be done in both backcountry and in wilderness areas. Look closely at figures 3 and 4. Based on

what you now know about backcountry and wilderness areas, name two outdoor recreation activities that can be done in both areas. Name two activities that can be done in backcountry areas but not in wilderness areas.

Introduction

Backcountry managers and wilderness managers want to do the best they can to protect the environments they manage. These managers also want people to enjoy the time they spend visiting backcountry and wilderness areas.

To do the best job, managers consider the number of people who are likely to participate in different backcountry and wilderness activities. Managers also want to have some idea of how many people will participate in these activities in the future. Managers want to know this number because too many people visiting backcountry and wilderness areas can reduce visitor enjoyment. Too many people might also reduce environmental quality by damaging animal and plant habitats.

The scientists in this study wanted to help backcountry and wilderness managers by projecting participation rates for different backcountry and wilderness activities. The scientists wanted to project the numbers of participants in backcountry and wilderness activities by the year 2060. The scientists identified four activities that occur in wilderness or other backcountry areas. These activities were challenge activities, horseback riding on trails, hiking, and visiting primitive areas (figures 5–8c).

The scientists in this study wanted to answer two questions: (1) How many people in the United States are projected to participate in four backcountry and wilderness activities in 2060 compared with participation in 2008? (2) On average, how many days per year is each person projected to participate in 2060 compared with the number of days per year in 2008?

Figure 5. Challenge activities include rock climbing, mountain climbing, mountain biking, and cave exploring. Look closely to find the rock climbers in this photo. They are climbing a mountain in Scotland called Buachaille Etive Mòr (**boo ka la ə tiv mòr**).

Photo by Babs McDonald.





Figure 6. Many people enjoy riding horses in backcountry and wilderness areas. Photo courtesy of Discover Outdoors, <http://www.discoveroutdoors.com>.



Figure 7. Hiking is one of the most popular backcountry activities. These kids are hiking in Scapegoat Wilderness in Montana. Photo courtesy of Forest Service, Northern Region.

Figure 8a. Visiting primitive areas includes activities like backpacking and primitive camping. Here, David Baldwin (on the right) and his father Dave are backpacking in Cumberland Island Wilderness.

Photo by Babs McDonald.



Figure 8b. Cumberland Island Wilderness and Okefenokee Wilderness are in southern Georgia.

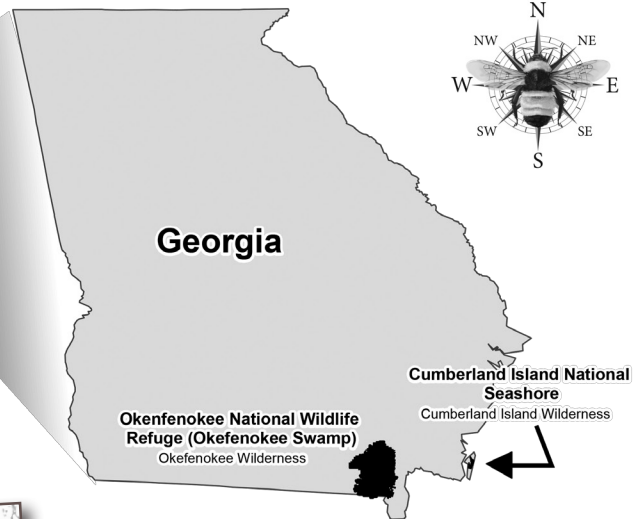
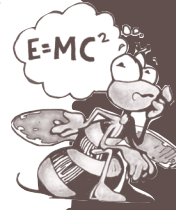


Figure 8c. Many people camp in the Okefenokee Wilderness. The Okefenokee Wilderness is a large swamp. The only way to travel in the Okefenokee Wilderness is by canoe or kayak. Because the Okefenokee Wilderness is a swamp, campers must set up camp on wooden platforms. Photo

by Babs McDonald.

Number Crunch

Over how many years did the scientists compare backcountry and wilderness recreation participation?



Reflection Section



Reread the first two sentences in the introduction. How would having an idea of how many people are likely to participate in backcountry and wilderness activities in the future help managers do their job better today?

Look at figures 5–8a and 8c. What makes these activities appropriate for wilderness areas? If you need a hint, reread “Thinking About the Environment.”

Look at figure 8c. How do you think managers preserve the value of solitude in the Okefenokee Wilderness?

Methods

The scientists used existing information to make their projections. First, they looked at data collected as part of a national survey of outdoor recreation. This survey included questions about participation in a number of outdoor recreation activities, including the four backcountry and wilderness activities shown in figures 5–8a and 8c.

This national survey asked questions of a **random** sample of American adults (see page 26). The number of people reporting participation in 2008 in each activity was recorded. Then, the scientists identified the **demographic** characteristics **associated** with people participating. For example, the scientists identified the percentage of women and the percentage of men who said they participated in mountain climbing in 2008.

This survey helped the scientists determine whether people with different demographic characteristics would be more or less likely to participate in backcountry and wilderness activities (figure 9).

The scientists then estimated the total number of people in the United States who might have participated in these activities in 2008. The scientists based their estimates on the demographic information they collected and compared it with U.S. demographics in the entire U.S. population. For example, assume that 25 percent of the people over age 60 answering the survey reported they had gone hiking in 2008. The scientists would have calculated a number representing 25 percent of the entire U.S. population over age 60 in 2008.

To learn how kids spend their time outdoors, read “Time Out!” by visiting

<http://www.naturalinquirer.org/Time-i-34.html>

Demographic and Other Characteristics	Probable Effect on Backcountry and Wilderness Participation
African American	Less likely to participate
Native American/American Indian	More likely to participate
Asian American	Less likely to participate
Hispanic	Less likely to participate, except for day hiking
More education	More likely to participate
Higher income	More likely to participate
Gender	Males more likely to participate
Living in a city	Less likely to participate
Living close to backcountry areas	More likely to participate
Continuing climate change	Somewhat less likely to participate

Figure 9. The scientists determined the relationship between participation and demographic characteristics.



Photo by Babs McDonald.

Why Are Random Samples Powerful?

When a random sample is taken, every member of the population has an equal chance of being selected for the sample. A population is the total number of individuals in an area. A sample contains only a percentage of the population from which the sample is taken. Because every member of the population has an equal chance of being selected in a

random sample, scientists assume that their random sample accurately represents the population.

For example, think about having a large bag (about 1 pound) of M&Ms®. You might want to know how many blue M&Ms® are in the bag. Instead of counting the entire bag, you decide to take a sample. You shake up the bag and pour out 50 M&Ms®. You then count the number of blue M&Ms®. You know that an average pound bag of M&Ms® contains about 660 M&Ms®. Out of the 50 M&Ms®, 10 M&Ms®, or 20 percent of your random sample, are blue. You calculate 20 percent of 660. You estimate that 132 M&Ms® in the bag are blue. You feel confident that your estimate is close to the actual number of blue M&Ms® because your sample was taken randomly. You can do this experiment yourself at home or in your classroom.

Scientists would report this number for the total number of people over age 60 hiking in 2008 (table 1). Remember, the estimates shown in table 1 were calculated from a random sample of Americans who answered the survey questions.

The scientists then looked at population projections for the year 2060. Population projections told the scientists how many women and how many men, for example, are likely to be living in the United States in 2060. The scientists identified population projections for a number of demographic characteristics (see figure 9). The scientists created a mathematical equation, or

model. They entered this model into a computer. In the model, the scientists included the likelihood that individuals with certain demographic characteristics would participate in an activity. The scientists included information from 2008, the population projections to 2060, and demographic information. The scientists used the mathematical model to project likely participation in each of the four backcountry and wilderness activities in 2060. Then, the scientists compared the projections for 2060 with the information they had for 2008.

Table 1. U.S. participation in 2008 for the four backcountry and wilderness activities.

Source: The National Survey on Recreation and the Environment.

Backcountry and Wilderness Activities	Number of Participants (in millions)	Percentage of the Population Participating	Average Number of Days Per Participant	Total Days in 2008 (in millions)
Challenge activities: mountain climbing, rock climbing, mountain biking, caving	25	11	4.8	120
Horseback riding on trails	17	7	16.3	262
Hiking	79	33	22.9	1,826
Visiting primitive areas: backpacking, primitive camping	91	38	13.2	1,233

Reflection Section



How Do You Read Tables With Large Numbers?

Scientific tables with large numbers usually present the large numbers in shorthand, which makes the table easier to read. In the first column in table 1, for example, the words, “in millions” is in parentheses. This header label means that, for the number of people participating in challenge activities, you should add 6 zeroes to 25, making it 25,000,000. Likewise, you should add 6 zeroes to the other numbers in the first and last columns to understand the true value.

What do you do when the shorthand number includes a decimal point? Insert a comma in the place of the decimal point, and substitute the number behind the decimal point for the first zero. For example, 25.3 would be written as 25,300,000 in table 1.



The scientists built a mathematical model to describe things associated with backcountry and wilderness activity participation in the United States. In addition to the effects of population change, what other changes might affect backcountry and wilderness activity participation by the year 2060?

Do you think more or fewer people are projected to participate in backcountry and wilderness activities in 2060 compared with 2008? (Hint: Think about whether the population is expected to grow or shrink over the next 50 years.)

Findings

The scientists projected an increase in participation in the four backcountry and wilderness activities (table 2).

The scientists projected that the percentage of people age 16 or older participating in backcountry and wilderness activities will increase between 2008 and 2060 (figure 10).

Table 2. More people overall may be participating in each of the four backcountry and wilderness activities in 2060 compared with the number in 2008.

Backcountry and Wilderness Activities	Projected Number of Participants in 2060 (in millions)	Projected Average Number of Days Per Participant in 2060	Total Days in 2060 (in millions)
Challenge activities: mountain climbing, rock climbing, mountain biking, caving	46.4	4.71	219
Horseback riding on trails	30.6	16.8	503
Hiking	134.4	24.2	3,330
Visiting primitive areas: backpacking, primitive camping	141	13.1	1,909

Compare table 2 with table 1 (below and on page 27).

Table 1. U.S. participation in 2008 for the four backcountry and wilderness activities.

Backcountry and Wilderness Activities	Number of Participants (in millions)	Percentage of the Population Participating	Average Number of Days Per Participant	Total Days in 2008 (in millions)
Challenge activities: mountain climbing, rock climbing, mountain biking, caving	25	11	4.8	120
Horseback riding on trails	17	7	16.3	262
Hiking	79	33	22.9	1,826
Visiting primitive areas: backpacking, primitive camping	91	38	13.2	1,233

Source: The National Survey on Recreation and the Environment.

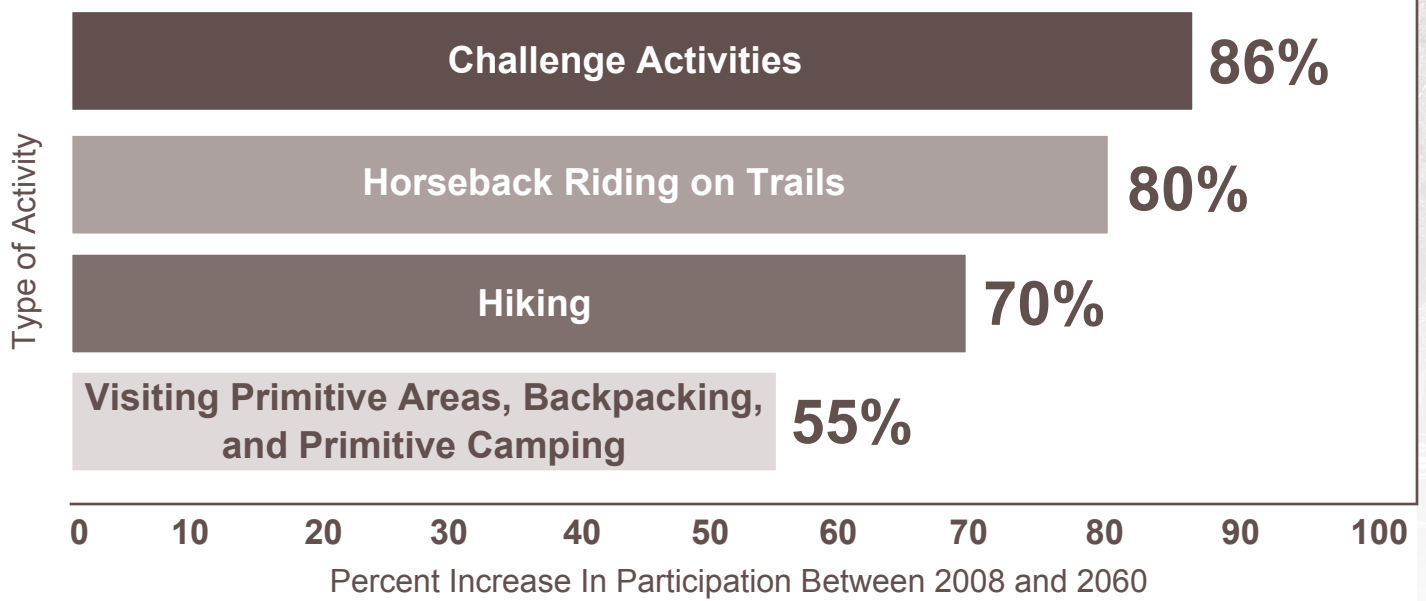


Figure 10. The projected percentage increase in the number of people age 16 or older who will participate in backcountry and wilderness activities between 2008 and 2060.

Reflection Section

How might the experience of backcountry and wilderness participants be different in 2060 compared with 2008? Think about what may not increase for these activities.

Carefully observe figure 10. How would you explain these findings? For example, what is likely to cause a large increase in challenge activity participation in the future?

Discussion

The scientists said that if their projections are correct, more people will want to use backcountry and wilderness areas in the future. If the number of people hiking increases, for example, then more people will be hiking on the same trails. This increased participation will change the experience of hiking on backcountry and wilderness trails in the future. The scientists found that when climate change is included in their models, the number of people participating in backcountry and wilderness activities in the future may still increase, but the rate of growth will likely be lower.



If the scientists' projections are correct, what wilderness benefits are likely to be affected in the future?

How old will you be in 2060?
Do you think you will be likely to participate in backcountry or wilderness activities in 2060?
Why or why not?

If you were a scientist offering information to a backcountry or wilderness manager about the number of participants in his or her area 10 years from now, what would you tell him or her?