

RECORDS OF BACKCOUNTRY USE CAN ASSIST TRAIL MANAGERS

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Abstract

Records of recreational use of Eastern backcountry areas have not been systematically kept by many trail management groups in the past. Decisions on backcountry site designs and facilities should not be made without information on visitor use and behavior. An analysis of sample data from records of overnight shelter use on the Long Trail, Vermont, indicates how such information may be used by trail managers.

INTRODUCTION

THE LEISURE TIME and income of many Americans have been increasing since the 1950's. Coincident with the country's higher standard of living has been a decline in the physical quality and availability of undeveloped land near metropolitan areas, where the majority of the population resides. Increasing numbers of people spend their leisure time in pursuit of recreational activities that take them away from the pressures of urban life and into the primitive environments of remote forest lands.

The mountainous lands of the Appalachian Highlands offer some of the most scenic and remote recreation sites in the East. The number of visitors to the trail systems in these mountains increased rapidly during the 1960's and early 1970's. Most of the backcountry trails and overnight facilities were constructed during the 1930's and were not designed to handle large number of visitors. Some of the more fragile sites have been adversely affected by the heavier visitor use. Some of the hiking trails have become severely eroded, and popular overnight sites have become denuded and congested with campers. Consequently, forest managers have been faced with the need to manage Eastern backcountry resources for a larger volume of dispersed recreationists.

Unfortunately, very little information has been collected to document the current use pattern of the forest visitors. Decisions on backcountry uses are being made without knowing how visitor use is distributed throughout the system or how visitor use at a specific site compares with the capacity of that facility. In this study, backcountry-use data have been taken from caretaker records of shelter sites on the Long Trail in Vermont to show how visitor-use information can be of help to managers who make decisions on site design. The types of information that can be gleaned from such records are presented in this paper.

THE GREEN MOUNTAINS

The Green Mountains form part of the Appalachian Highlands. The mountain range lies along a north-south axis through Vermont, extending from the Massachusetts line to the Canadian border. Formed about 350 million years ago, these mountains have undergone extensive weathering and erosion, and are now relatively low and rounded compared to the younger mountain ranges in the western United States. The highest peak, Mt. Mansfield, is 4,393 feet.

Hardwood forests of birch, beech, and maple on the lower slopes gradually grade into northern spruce-fir forests at elevations above 2,800 feet. Alpine tundra appears on the summits of two of the high peaks, Mt. Mansfield and Camel's Hump. These and most of the other high peaks lie in the northern section of the range. Within the southern section, several scenic ponds lie between the crests of lower mountains. The recreational attractions of each section are equally unique.

The Long Trail

In 1910 the Green Mountain Club (GMC) was formed by 23 men who were interested in constructing a trail that would run along the ridgeline of the Green Mountains. Permission was obtained from the various landowners to cut a trail through their lands and build shelters or use existing camps and farmhouses for overnight facilities. The trail was constructed section by section over a period of 21 years by GMC volunteers and State crews. During this time, 14 shelters were built. By 1931, a 263-mile trail traversed Vermont from Massachusetts to Canada (Fig. 1), passing over Vermont's highest mountain peaks and skirting several scenic mountain ponds. The trail was one of the earliest long-distance trails in the country, predating the Appalachian Trail, and was named The Long Trail (Green Mountain Club 1977).

Today, about half of the trail crosses private property. Fifteen percent of the trail passes

Figure 1.— Location of the Long Trail.

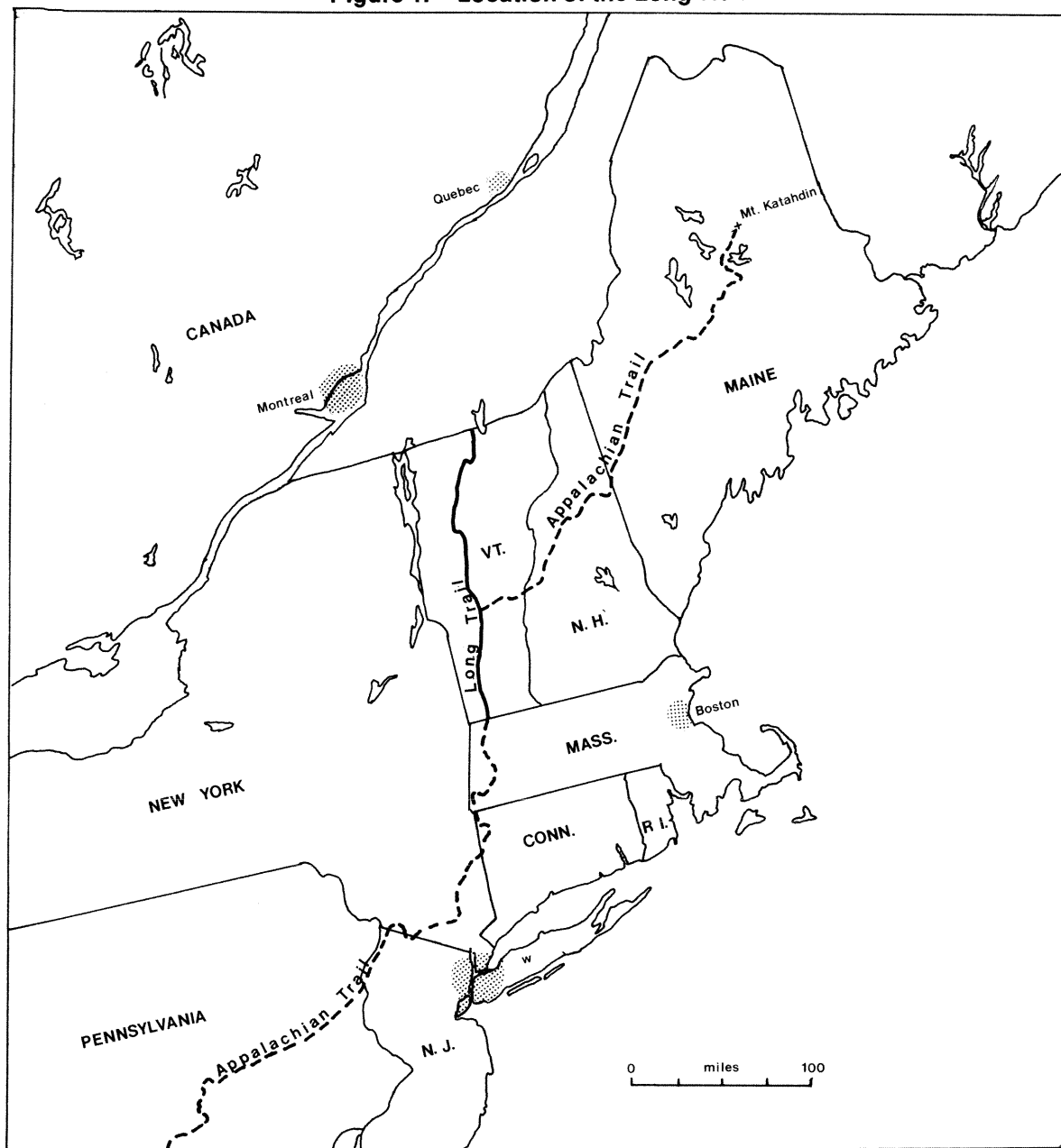
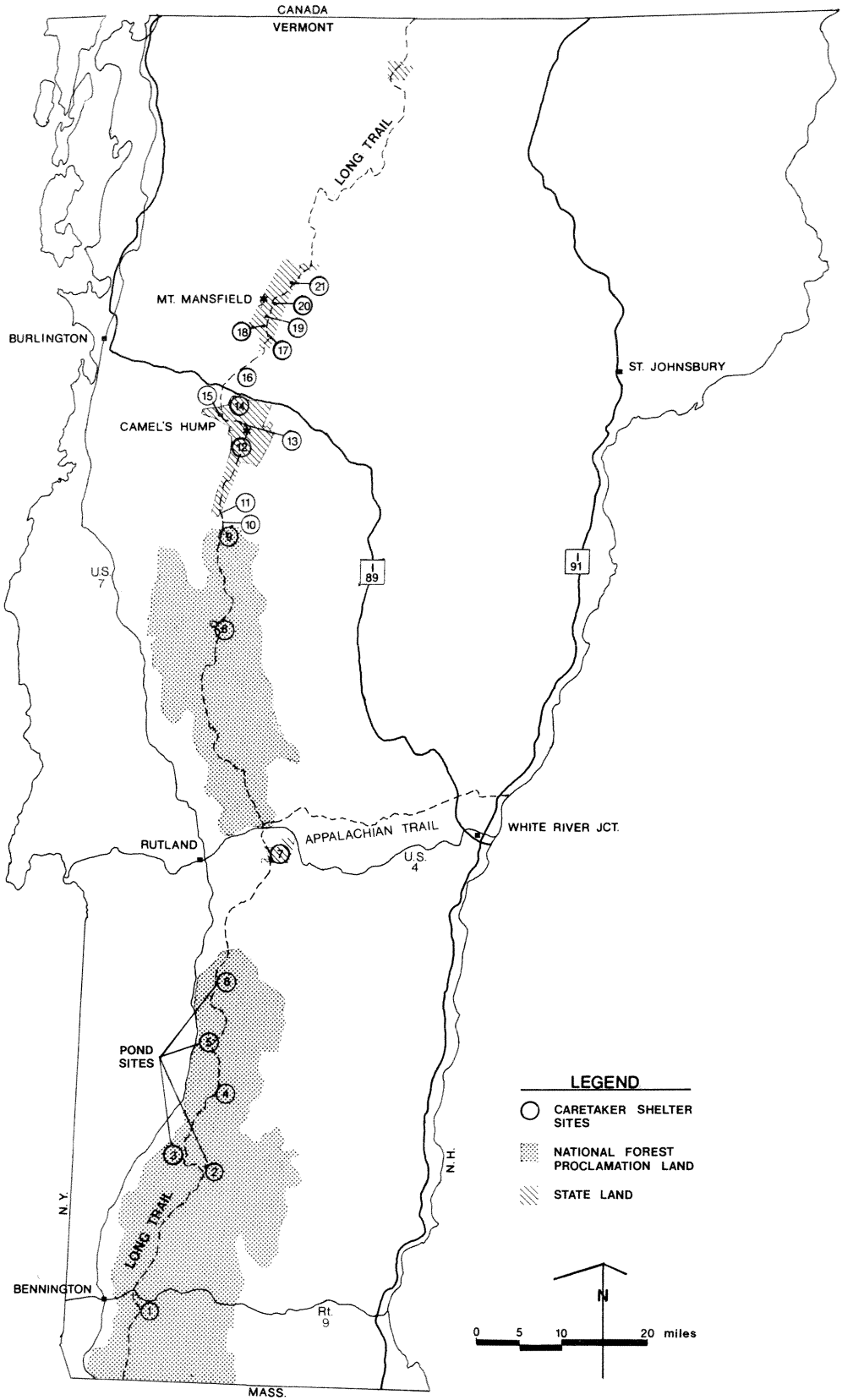


Figure 2.— The Long Trail and the caretaker overnight sites.

1. Congdon Camp
2. Stratton Pond
3. Bourn Pond
4. Bromley
5. Griffith Lake
6. Little Rock Pond
7. Cooper Lodge
8. Skyline Lodge
9. Castlerock
10. Glen Ellen Lodge

11. Stark's Nest
12. Montclair Glen
13. Gorham
14. Buchanan
15. Wiley
16. Bolton
17. Taylor
18. Twin Brooks Primitive Tentsite Area
19. Butler
20. Taft
21. Sterling Pond

THE LONG TRAIL



through State land, primarily in the northern section. The Green Mountain National Forest owns land on 40 percent of the trail, though the proclamation boundaries surround about 50 percent of the trail, as shown in Figure 2. Most of the National Forest proclamation land is a patchwork of Federal and private lands. The Appalachian National Scenic Trail, under the jurisdiction of the National Park Service, shares the southern section of the trail (about 97 miles) from the Massachusetts border to U.S. 4 at the Sherburne Pass.

The Green Mountain Club continues to be the trail steward. The U.S. Forest Service and the State of Vermont work cooperatively with the club on those sections of the trail that pass through their lands. Multiple land ownership of the trail, however, has increased the complexity of managing the trail for overnight hikers. Camping regulations are different for different areas. On Federal land, tenting and campfires are allowed anywhere along the trail. Where the trail passes through State land, tenting and campfires have been prohibited without a special permit since 1971.¹ There is one exception to this rule: Tenting is permitted at the Long Trail shelter sites on State land when the shelters are full. Tenting on private land is not permitted without permission of the landowner.

Today, about 70 overnight shelter facilities are found along the trail at fairly evenly spaced sites about 4 miles apart. Most of the shelters on the northern section of the trail are enclosed structures with bunk and floor space for 8 to 12 people. Most of the shelters on the southern section of the trail are three-sided lean-to's which can accommodate six to eight people.²

The Green Mountain Club caretaker program

The Long Trail shelter facilities received relatively few recreational visitors before the 1960's. Increased interest in hiking and camping has changed that situation. Estimates from old register data indicate that shelter use was 3 to 15 times less than current use. Today, the trail is within a 1/2-day's drive of more than 53 million people. Use of off-road camping areas within the Green Mountain National Forest increased about two and one-half times between 1965 and 1972.³

The Green Mountain Club found it necessary to respond to the increased trail use. The club began an informal caretaker program at the most heavily visited sites to inform hikers of the fragility of some of the mountain environments. In 1969, an official program was started with two paid caretakers. The program expanded to 13 caretakers by 1972, then to about 21 caretakers by 1975 (Green Mountain Club 1975).

Individual caretakers live at assigned shelter sites from mid-June to the beginning of September. A few of the more popular sites retain caretakers until mid-October. The fees paid by the overnight visitors for the use of the shelters or tent platforms go directly to the caretakers. In addition, each caretaker receives a small stipend from the GMC to help cover expenses while living at the site.

Caretakers can conveniently and accurately observe and record visitor use at shelter sites (Fig. 2). Overnight visits have been recorded since 1970. The visitor records include the number of persons and organized groups using the shelters. In addition, overnight hikers are requested to register their residence, party size, trip duration, and the origin and destination points of their hiking trips. These records provide data that help us understand the fluctuations in use of the backcountry overnight facilities and some of the characteristics and preferences of the Long Trail population.

¹ During the 1960's, there was excessive long-term, roadside camping-cum-homesteading on State lands. This prompted the Vermont legislature to pass a law (State Act 86, 1971) prohibiting all tenting on State land. The State is now considering a modification of this law.

² Information on shelters and site conditions is from: (1) U. S. Forest Service, 1973. Shelter site inspection report, Appalachian-Long Trail system, plan of management. U. S. Dep. Agric. For. Serv., Green Mt. Natl. For. Append. 5 Office Rep. 94 p. (2) U. S. Forest Service, 1975. Long Trail status survey. U. S. Dep. Agric. For. Serv., Northeast. For. Exp. Stn., Durham, N. H. Office Rep.

³ U. S. Forest Service, 1972. A plan of management, Appalachian-Long Trail system. U. S. Dep. Agric. For. Serv., Green Mt. Natl. For. Prelim. Office Rep. 33 p.

CHARACTERISTICS OF THE LONG TRAIL HIKERS

Information from trailhead self-registration boxes and caretaker observations indicates that day hikers represent the largest proportion of users on many parts of the trail. However, the difference between the numbers of day and overnight hikers cannot be determined from the available records as few day hikers register at a shelter site.

The sample of visitor records used for this paper pertains to overnight hikers. Of all the overnight hikers passing through caretaker sites in 1975 and 1976, 67 percent were on the trail for 2 to 5 days (short-distance overnight hikers) and 33 percent were on the trail for more than 5 days (long-distance overnight hikers). These proportions were similar for both the northern and southern sections of the trail.

Hiker residence

The Long Trail attracts hikers from all parts of the country, but the portion of in-state hikers using the trail is relatively small compared to the

total out-of-state hikers (Table 1). Most of the short-distance hikers (64 percent) on the southern section of the trail come from the surrounding, more densely populated states—Massachusetts, New York, and Connecticut. The southern section is, of course, more conveniently located to the residents than the northern section. Vermont residents account for nearly half (43 percent) of the short-distance use on the northern section of the trail.

Most of the long-distance overnight hikers on the trail are from out of state. The proportion of long-distance hikers who come from non-New England States is higher in the southern section of the trail (33 percent) than in the northern section (16 percent), due, perhaps, to the use of the Appalachian Trail.

Group sizes

Hiking parties of more than 10 persons have been discouraged by all the Long Trail management groups since the early 1970's. The 1977 edition of the GMC Long Trail Guidebook now en-

Table 1.—Percentage of short- and long-distance overnight hikers from different states using the southern and northern section of the Long Trail, 1975

State	Short-distance hikers		Long-distance hikers		All hikers	
	Southern	Northern	Southern	Northern	Southern	Northern
In-State						
Vermont	19	43	10	16	16	36
Out-of-State						
Massachusetts	27	13	17	24	24	16
New York	19	7	18	18	19	10
Connecticut	18	6	14	14	17	8
R.I./N.H./Maine	4	3	4	3	4	3
Other U. S.	12	13	33	16	19	14
Canada	1	14	4	9	2	13
Total Out-of-state:	81	56	90	84	85	64

Table 2.—Percentage of short- and long-distance overnight hikers by size of party, 1974 and 1975

Hikers						
	1	2	3	4-6	7-10	10 or more
Short-distance	16.4	42.1	14.9	16.9	6.0	3.7
Long-distance	45.1	31.9	9.5	7.7	3.5	2.3

courages hikers to travel in groups of no more than four to six.

In the mid-1970's, the majority of the Long Trail hiking parties were of less than three persons (Table 2). Long-distance hikers tended to travel alone while short-distance hikers were most often in groups of two. A relatively small proportion of the hiking parties were composed of more than 10 persons.

Organized groups

Hiking groups of Scouts or from summer youth camps and school or community organizations have been regular users of the Long Trail. For each of the past 5 years, organized groups have accounted for slightly more than 25 percent of the total overnight visitors at the caretaker sites (Fig. 3).

During 1975 and 1976 organized groups could be found at a caretaker site on an average of 16 percent of the days in the summer season. However, the popular pond sites, Little Rock Pond and

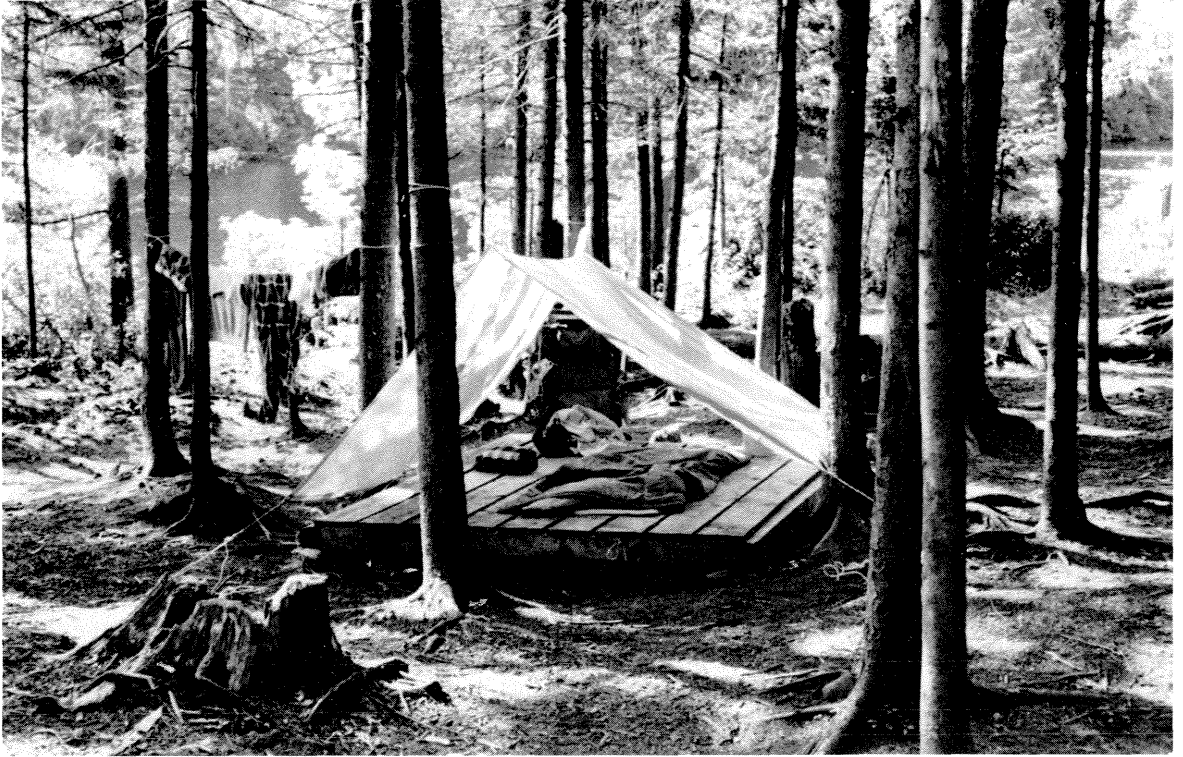
Stratton Pond, and the popular high-peak sites on Mt. Mansfield and Camel's Hump, were visited by organized groups more frequently (about 30 percent of the season). These groups used the shelter sites as much on weekdays as on weekends. Between 1974 and 1976 the average size of organized groups dropped from 12.7 to 10.5 persons and the percentage of organized groups of more than 10 persons dropped from 42 percent to 32 percent. The efforts of the trail managers to reduce group sizes may be responsible for some of the decline, but there is still a need to continue these efforts.

Most of the groups (45 percent) come from the camps and Scout troops of Vermont, Massachusetts, and Canada. Groups from other regions of the country account for about 30 percent. The higher proportion of local group use should enable the trail managing agency to keep the participating organizations well informed of new trail regulations and of preferred sites and dates for large group trips.

Figure 3.—A large organized group preparing to hike the Long Trail to Little Rock Pond.



Figure 4.—Tent platforms at Griffith Lake.



Membership in the Green Mountain Club

The majority of the overnight users of the Long Trail caretaker sites are not Green Mountain Club members. In 1976 only 14 percent of the total overnight visitors were GMC members, though at a few sites, close to 30 percent of the users were GMC members.

In the early 1900's, the Green Mountain Club had about 200 members. With increased interest in the club's conservation and recreation management work, membership grew steadily to about 3,700 persons by 1976.⁴

While the growth rate in club membership has averaged about 20 percent during the last 5 years, the proportion of GMC members using the Long Trail overnight sites has increased about 60 percent during this time. Most of these members are long-distance hikers, which may be an indication that younger people, the traditionally more active trail users, are joining the club.

⁴ Personal communication with Larry Van Meter, Exec. Dir., Green Mountain Club (1977).

Tenting and shelter preferences

A survey of southern Appalachian Trail users in Virginia, Tennessee, North Carolina, and Georgia indicated that hikers there preferred shelters to tents by a margin of three to one (Murray 1974). Appalachian Trail "through hikers" in the Shenandoah National Park preferred shelters to primitive camping and were more tolerant of large numbers of people at their overnight sites than the short-distance hikers.⁵

From caretaker records of overnight hikers on the southern section of the Long Trail (the Appalachian Trail section), it appears that equal proportions of hikers seem to prefer tenting and shelter camping. At six caretaker sites on the trail that offer a choice between tenting or shelter use (sites primarily at the southern ponds, Fig. 4), an average of 51 percent of the overnight visitors used tents each season since 1973. (This ranged from 35 to 70 percent, depending on the particular site and year.) At most of these sites, the caretakers live in

⁵ Preliminary study results from Ben W. Twight, W. Virginia University, Morgantown (1977).

Table 3.—Percentage of nights during the summer season (1975 and 1976) that tents were used, by shelter use level

Use	Shelter use level				Total for season
	Empty	1-50% full	51-100% full	Over-capacity	
Tents not used	6.6	20.6	7.8	1.8	35.9
Tents used	7.2	37.4	16.8	2.9	64.2

separate tents, so their presence should not affect the hiker's choice.

Table 3 shows the percentage of nights during the summer season that tents were used at different shelter occupancy levels. This table pertains to sites where there is a choice between using the shelter or using a tent. Tents were used most often when the shelters were less than half full or empty, and not just when the shelters were reaching crowded conditions (over half full). The desire for privacy may outweigh the convenience of shelter camping.

At Little Rock Pond, the shelters have been relocated out of view of the pond (up to 1/4 mile away) in an effort to reduce physical damage to portions of the shoreline. The opportunity to camp with a pond view is available only to tenters. It is therefore not surprising that 80 percent of the tenting at Little Rock Pond was done when the shelters were less than half full.

DISTRIBUTION OF HIKERS ON THE LONG TRAIL

Information from hiker registration sheets has been used to determine the relative distribution of hikers along the trail. From the sample of 20 and 21 sites for 1975 and 1976, respectively, the trail use by overnight hikers during the two seasons was plotted (Figs. 5 & 6). The geographic distribution of hikers on the trail was remarkably similar for both years.

Not all sections of the trail received the same amount of use. The most frequently used sections were those:

- Traversing the highest mountain peaks (over 4,000 feet) where short side trails (less than a 3-mile hike from a road) provide access to the Long Trail.

- Between a road and a scenic mountain pond less than 5 miles from the road.

The least-used sections were those:

- Traversing the lower mountain slopes in a fairly remote area north of the Appalachian Trail cut-off.
- Farthest from the northeastern metropolitan areas.

Overnight use was very high at two of the southern pond sites, Little Rock Pond and Stratton Pond, and at a site on Mt. Mansfield (Figs. 7 & 8). Lowest overnight use was at sites not shown with overnight facilities on the Long Trail Guidebook map and at sites located at the base of high mountains which also had overnight facilities at higher elevations.

Frequency of overnight site use

Daily caretaker records have been used to study the fluctuations in the use, or demand, for the overnight facilities. These figures provide two measures of site use: the percentage of the season that the site is used at different occupancy levels, and the regularity of the flow of visitors to the site. Together these measures can indicate what management attention, if any, might be needed at a given site.

The use patterns at each caretaker site differ according to the location and capacity of each site. Most of the shelters located near the summits of Vermont's two most popular mountains were over half full about 40 percent of the 1975 and 1976 seasons. In contrast to these, five of the caretaker sites were over half full less than 10 percent of the two seasons. Figure 10 shows the total seasonal visitor use of two different shelter sites—one with a fairly even distribution of use, and one with an uneven distribution. At Montclair Glen, a popular shelter site near the summit of Camel's Hump

Figure 5.—Relative distribution of Long Trail use.

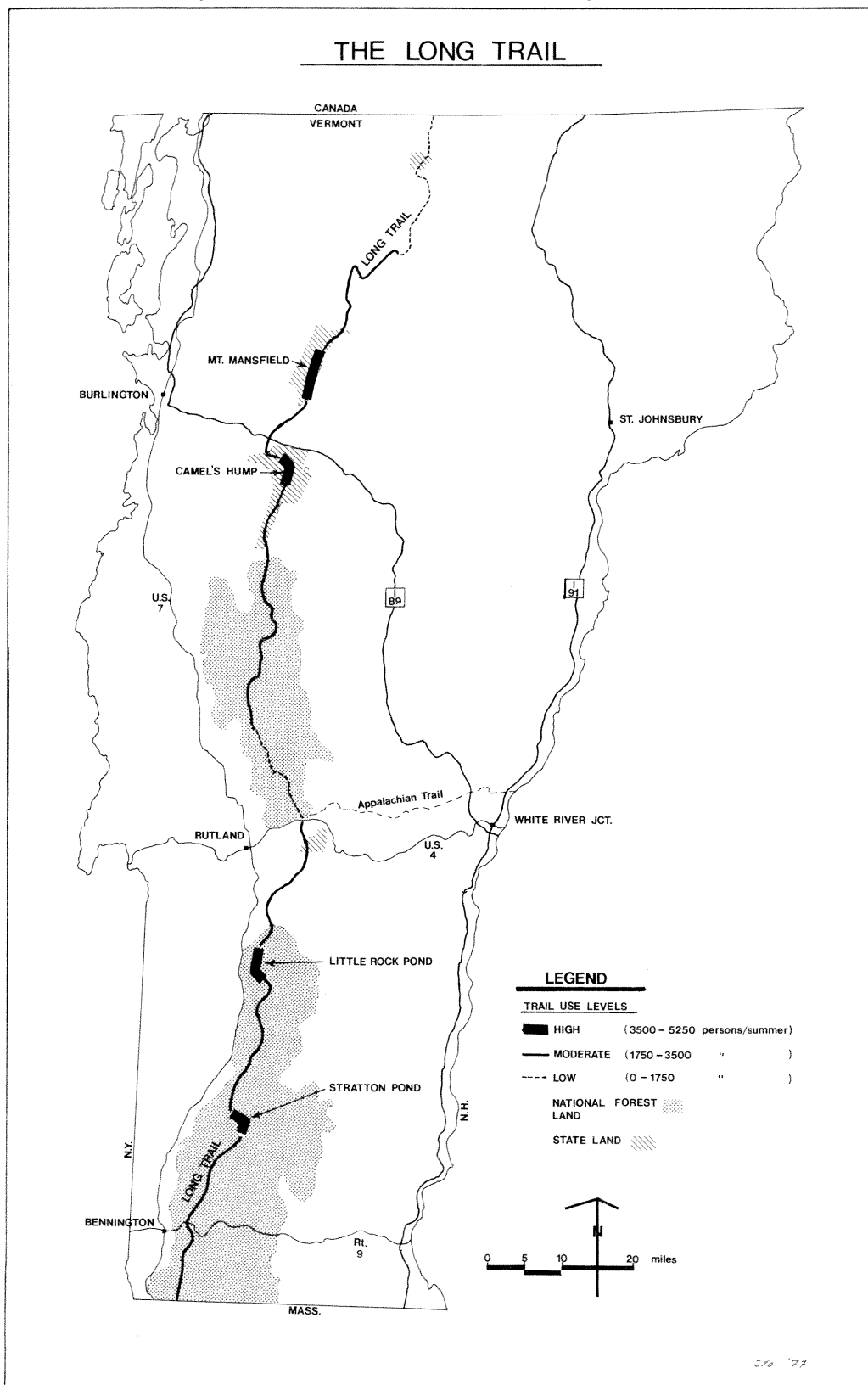
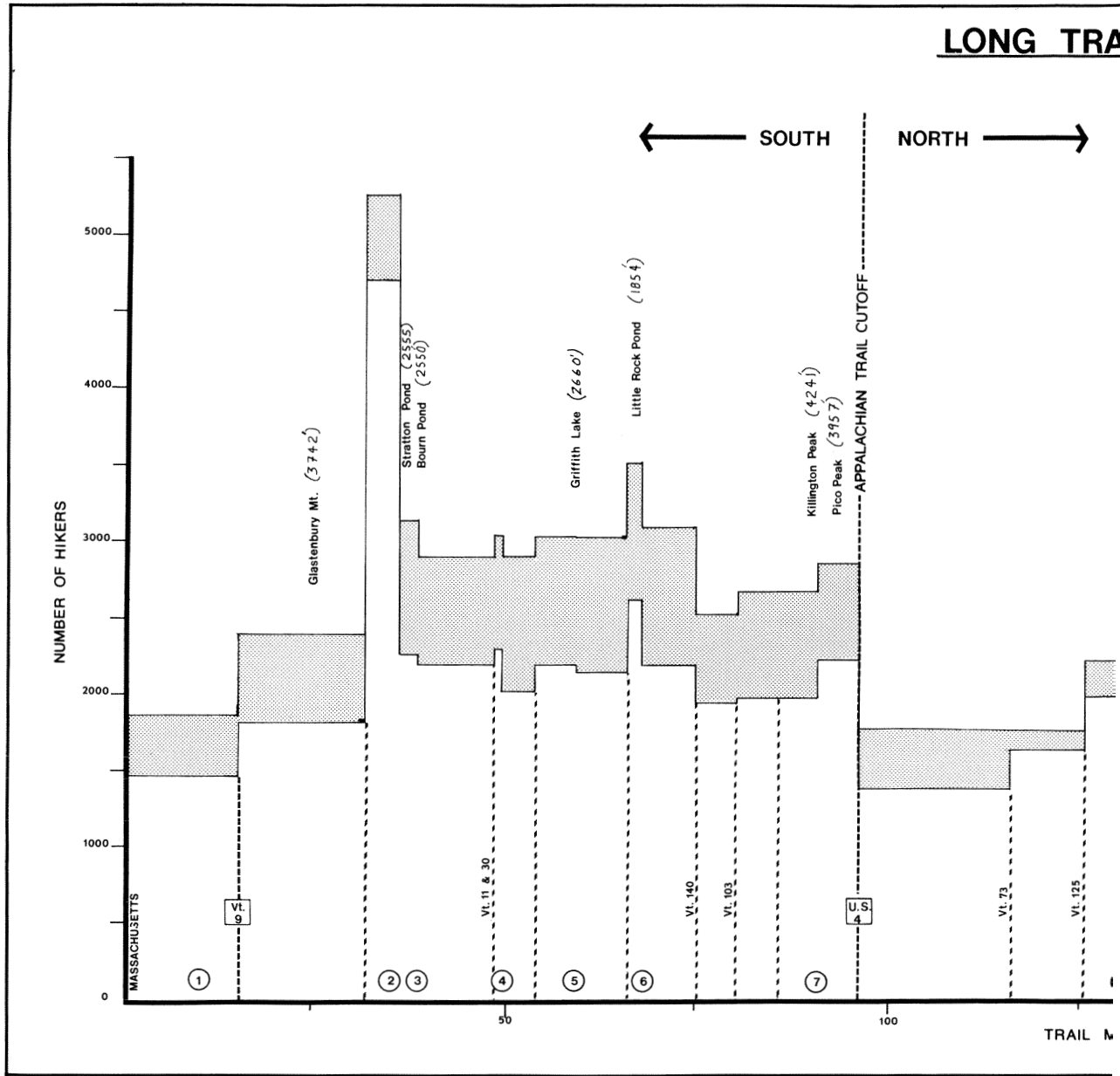


Figure 6.— Distribution of Lo

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rail visitors in 1975 and 1976.

USE

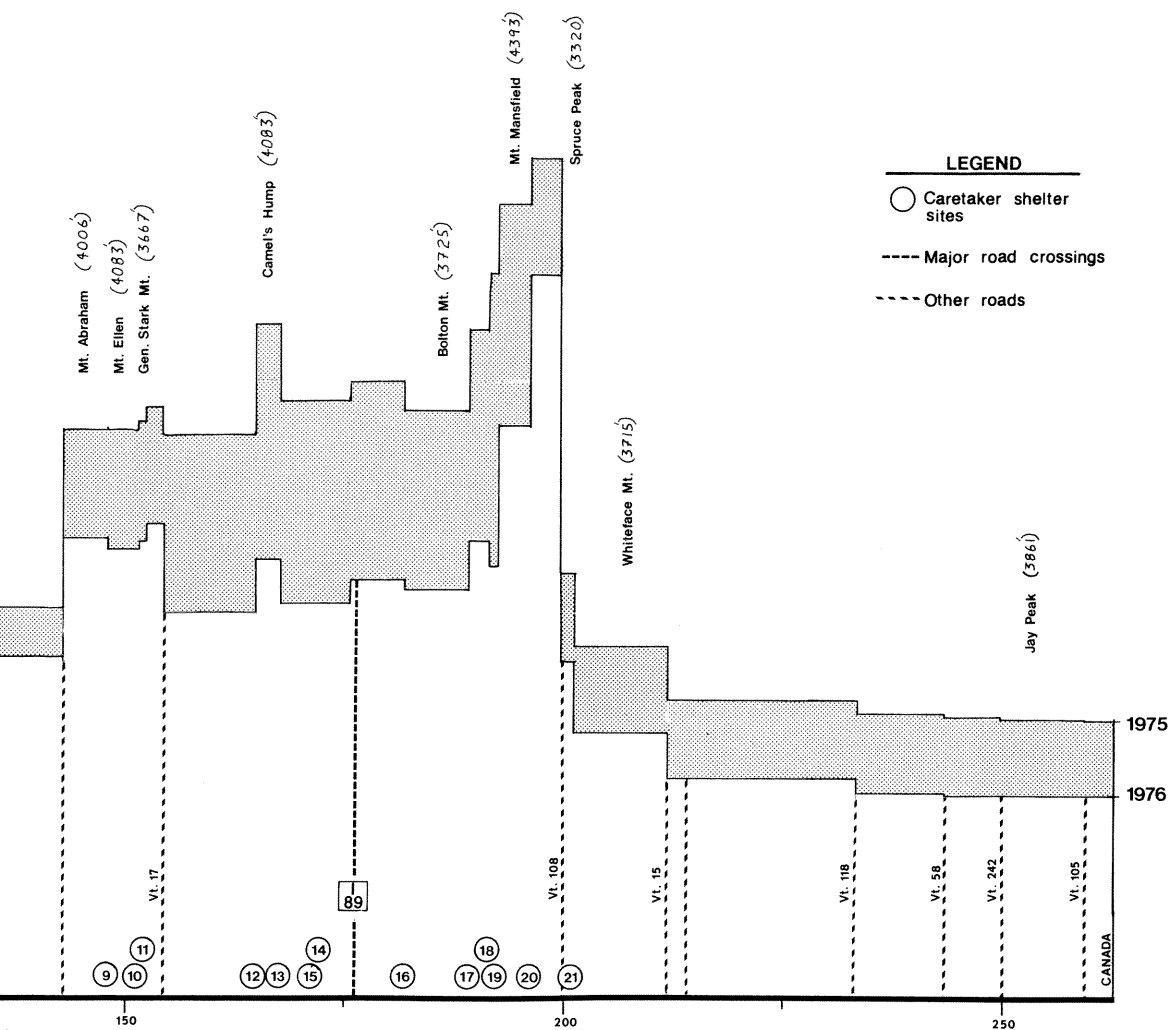


Figure 7.—View of Stratton Pond from one of the shelters.



(Fig. 9), visitor use exceeded the shelter capacity about 31 percent of the season (Fig. 10). The flow of visitors to this site was fairly even, however. The shelter was over half full about 50 percent of the season, and empty only 7 percent of the season. This shelter is on State land, so visitors may tent around the shelter only when the shelter is full. However, overflow conditions for a third of the season could indicate a need for additional facilities if use levels remain the same.

At Sterling Pond, a shelter site located near a less-popular mountain peak, the flow of visitors was very uneven. The shelter was empty about 30 percent of the season and over half full only 10 percent of the season (Fig. 10). The capacity of the site is over twice that of Montclair Glen and its occupancy was rarely overcapacity (1.3 percent of the season). This site could handle many more visitors than it does if managers attract more people to it.

Seasonal trends

During the summer season (May to September), overnight use of the more popular sites increases by a nightly average of six persons each month and peaks in mid-August. Several sites have been observed to attract fall weekend use that is as high or higher than summer weekend use. Caretakers might be advisable for some of the sites on fall weekends. Uncrowded trails, fewer insects, and the lightweight, warm camping gear now available may be factors that influence the hiking patterns of some backcountry recreationists in the Northeast.

Weekday/weekend comparisons

Visitor registration was used to determine whether weekend use of overnight sites was higher than weekday use. Five of the 21 caretaker sites remained empty over 40 percent of the weekdays

Figure 8a.—The Long Trail approaching Mt. Mansfield from the south.



Figure 8b.—Overnight site near Mt. Mansfield (Butler Lodge — elevation 3,040 feet).



(Sterling Pond, Buchanan, Stark's Nest, Castle-rock, and Glen Ellen). Two of these sites were also empty over 40 percent of the weekend nights. Each of the five sites is located on or near a mountain of over 4,000 feet elevation, a generally attractive feature to Eastern backpackers.

The difference in numbers of visitors on weekend nights and on weekday nights was statistically significant for only about 25 percent of the caretaker sites (three to five more persons on weekend nights).⁶ These sites were located near two popular high peaks and the southernmost pond site, Stratton Pond. In 1975, the four southern pond sites received heavier tenting use on weekends (4 to 15 more tenters per night on weekends). However, in

⁶ Determined at the 90 percent confidence level, using the analysis of variance statistical program of SPSS, Version 6 (1976).

1976 only Stratton Pond received more tenting use on weekends.

In general, there is no great difference between weekday and weekend use at most of the caretaker sites. Only the three most popular locations on the Long Trail contributed to higher weekend use at the adjacent overnight sites.

HIKER VOLUME

In 1976, the number of recorded overnight visitors during the summer season was between 60 and 2,000 persons per site, depending on the location, popularity, and capacity of the site. Use of the more popular overnight sites during the peak summer months, July and August, averaged about 8 persons per night at northern sites and 16 persons per night at southern sites.

Figure 9.—Montclair Glen (elevation 2,670 feet) — overnight site near Camel's Hump, Vermont.



Figure 10.—Visitor use at two overnight sites during the 1976 season.

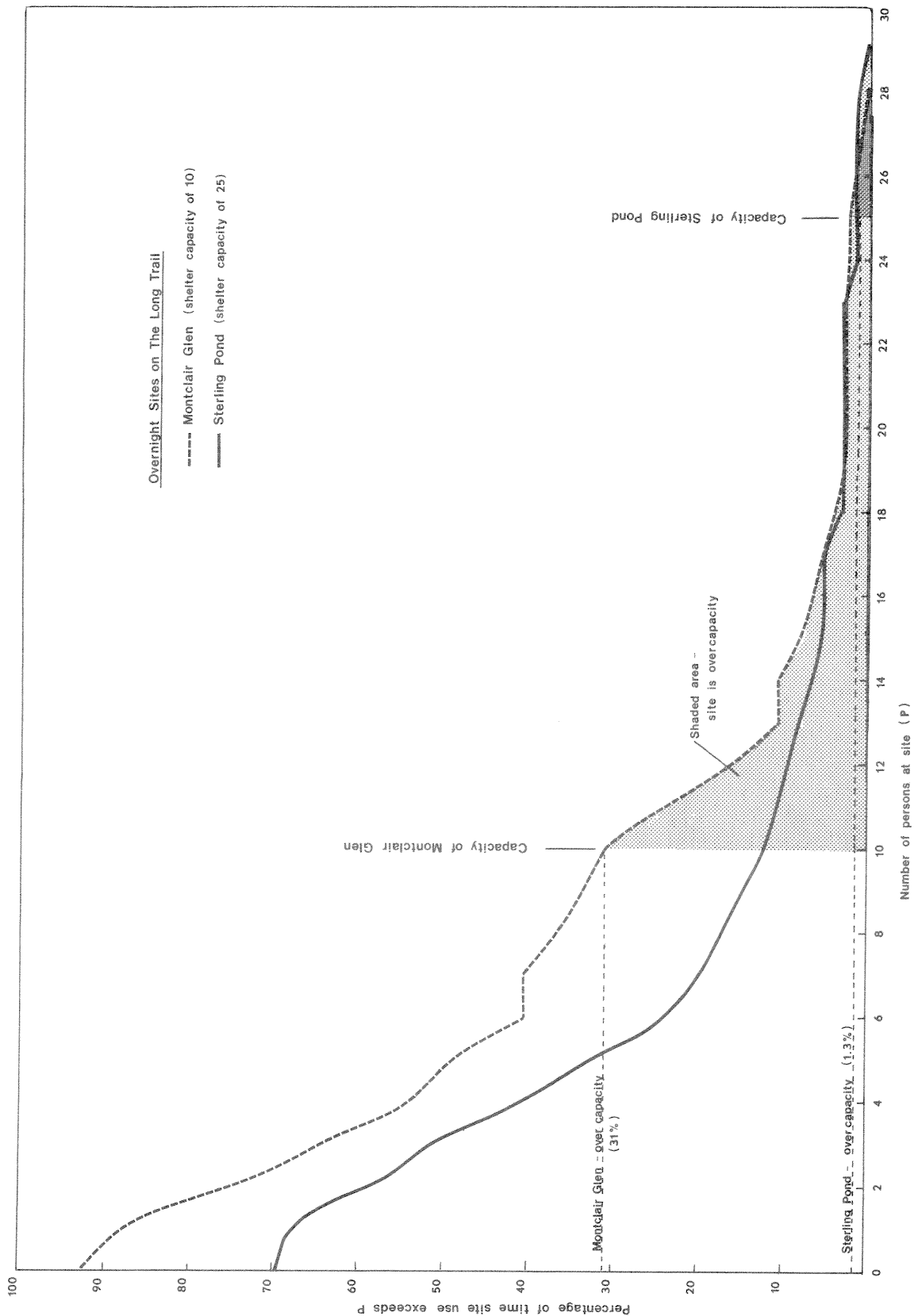
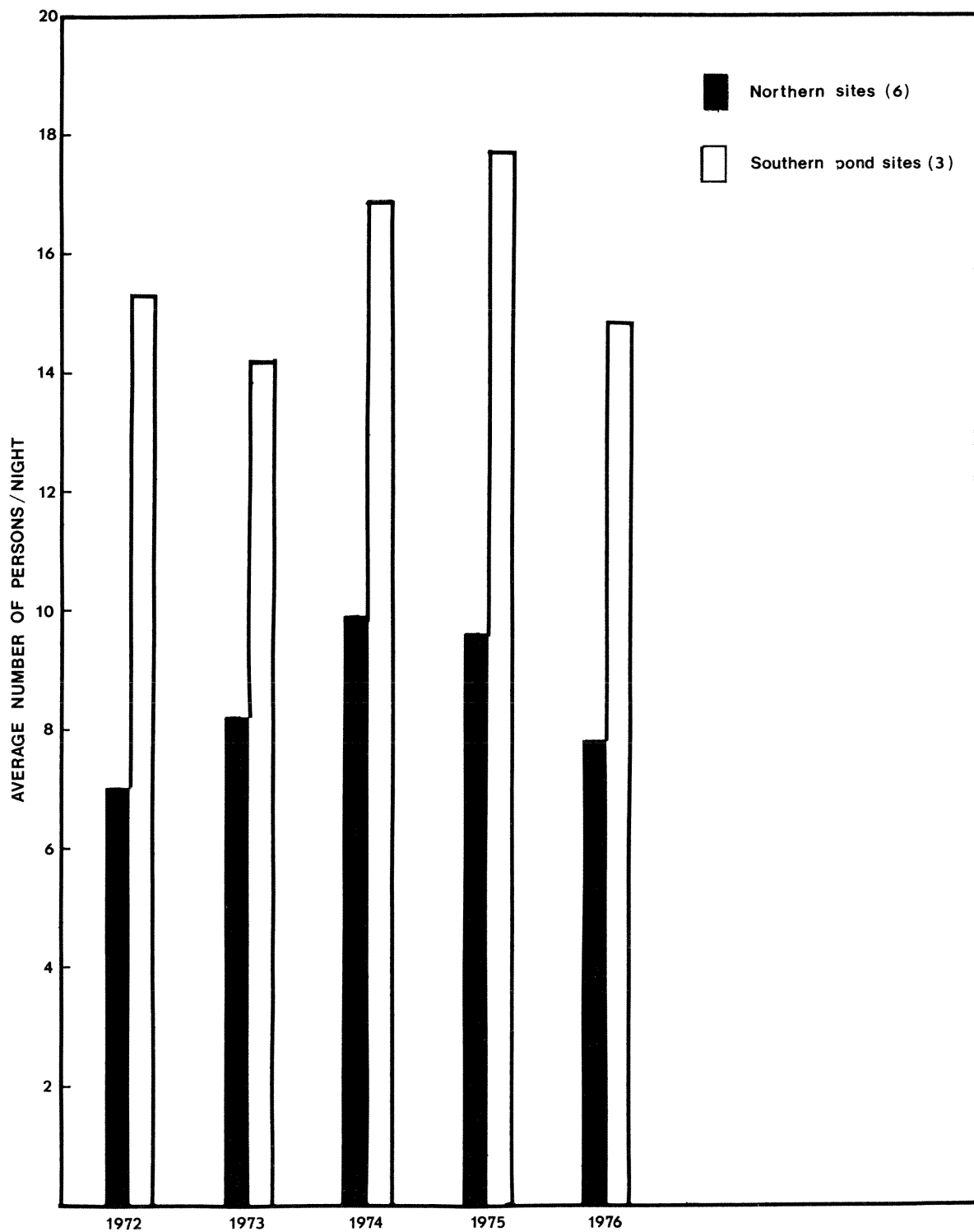


Figure 11.—Average overnight use at caretaker sites
(July and August).



Records of Long Trail use before 1970 are scarce. During the 1960's, trail managing groups observed significant increases in trail use by physical changes at shelter sites and the number of hikers encountered on the trail. Since 1972, when comparative records of overnight use were started, the average number of visitors per night per site increased until 1975, the peak year (Fig. 11). Sites at the popular northern peaks on State land have had relatively small fluctuations in use each year, despite the tenting regulations imposed since 1971. The southern pond sites have had greater fluctuations in use each year (average differences of 3 to 4 persons per night between years). In no case do the fluctuations show a clear downward or rising trend.

USE OF VISITOR RECORDS FOR MANAGEMENT DECISIONS

Trends in overall use levels are valuable for predicting future facility needs. Recreational preferences, however, are subject to erratic changes as economic or cultural conditions change. Probably the best that can be predicted from a few years of data is a pattern of use for the following 1 or 2 years.

Visitors' residence data can indicate where to direct educational information and regulations on trail use, and where funds to support backcountry facilities might be sought.

As most of the out-of-state visitors to the Long Trail come from Massachusetts, New York, and Connecticut, the trail-maintaining groups should direct their information to those states. A substantial portion of the short-distance hikers to the northern section of the trail are Canadians, therefore, Montreal and Quebec might also be targets for trail information.

As the trail is used most by out-of-state visitors, maintenance costs should not be left entirely to the State or local governments. State funding for the Long Trail, however, might best be used for the northern section of the trail since a large proportion of the hikers there are from Vermont.

The majority of the hiking parties travel in groups of one to three persons. The design of overnight facilities should take this into account. At sites where tent platforms are considered necessary to reduce ground compaction, platforms should be large enough to accommodate a two- or

three-man tent, and most of the platforms should be spaced to give privacy to each party.

For large organized groups, platforms can be clustered together. A separate area should be chosen for these groups, preferably out of sight and sound of the other campers.

Most of the Long Trail shelters can accommodate, at most, only one large group at a time. At sites where it is deemed undesirable to have over-capacity conditions, some sort of reservation system for large groups may be necessary. This would reduce the possibility of having two groups at a site on the same day. Other hikers could also find out when to expect large groups at a specific site. Alternatively, separate tenting areas could be established primarily for large group use.

Green Mountain Club members account for less than 15 percent of the total visitor use at overnight sites, nevertheless the club should continue efforts to learn the preferences of the rest of the trail users. Their caretaker program can accomplish this by continued observation of visitor behavior and through informal discussions with the visitors.

Tenting is clearly preferred by some hikers. The availability of lightweight tents and stoves has made backpacking much more convenient than it was 15 years ago. In 1976, about 80 percent of the northern shelter visitors cooked their meals on portable stoves. Permanent shelters and sites with firewood are no longer essential, but are merely one type of amenity that should be included at some sites to provide a variety of backcountry opportunities.

The common assumption made by backcountry visitors and managers that there are hordes of weekend visitors using the shelter facilities is not entirely true. Visitor-use records can provide managers with more accurate information on available space, and decisions can be made to increase overnight capacities of those sites that are more frequently in demand or develop a system to limit the number of overnight visitors to these sites. Infrequent but heavy use of a fragile mountain site can be more detrimental to the physical durability of the site than evenly distributed use (Burden and Randerson 1971).

Trail managers can attempt to redistribute the use of a site over more of the season as well as encourage visitors to use other available sites. The means to accomplish this might include:

- Inform hikers about the relative use at each site

with the purpose of attracting hikers to the lesser-used sites.

- Charge a higher use fee at the heavily used sites.
- Charge higher fees on weekend nights at sites that receive heavy use on weekends.
- Alter the locations of shelters or side trails to the shelters.

Alternative management plans for a given site must take into consideration: (1) the management objectives for the entire trail-shelter system; (2) the use patterns at adjacent sites; (3) how much additional use a specific site can physically handle with available maintenance techniques and money; and (4) the social densities that will be most satisfactory to the overnight visitors. Once these questions are answered, the value of a backcountry-use inventory can be best realized.

CONCLUSION

Records of dispersed recreation site use have been viewed skeptically by managers as informa-

tion too elusive and costly to obtain. But with a lack of meaningful data on visitor use, trail management decisions have verged on the arbitrary.

The actual use of trails and overnight shelters should be considered essential information when planning backcountry facilities. Site durability could then be compared to existing patterns of visitor use, and planners could arrive at logical solutions to potential problems.

Decisions to close or restrict the use of sites cannot be made without affecting some segment of the hiking population. The risk of causing dissatisfactions among large numbers of backcountry visitors by making an inappropriate decision may outweigh the cost of collecting data on visitor use. Likewise, the costs incurred by overdesigning some backcountry sites should encourage managers to learn to what extent the facilities are used. Judicious use of the limited budgets for the construction and maintenance of facilities requires that decisions be based on the actual use of the backcountry resources.

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