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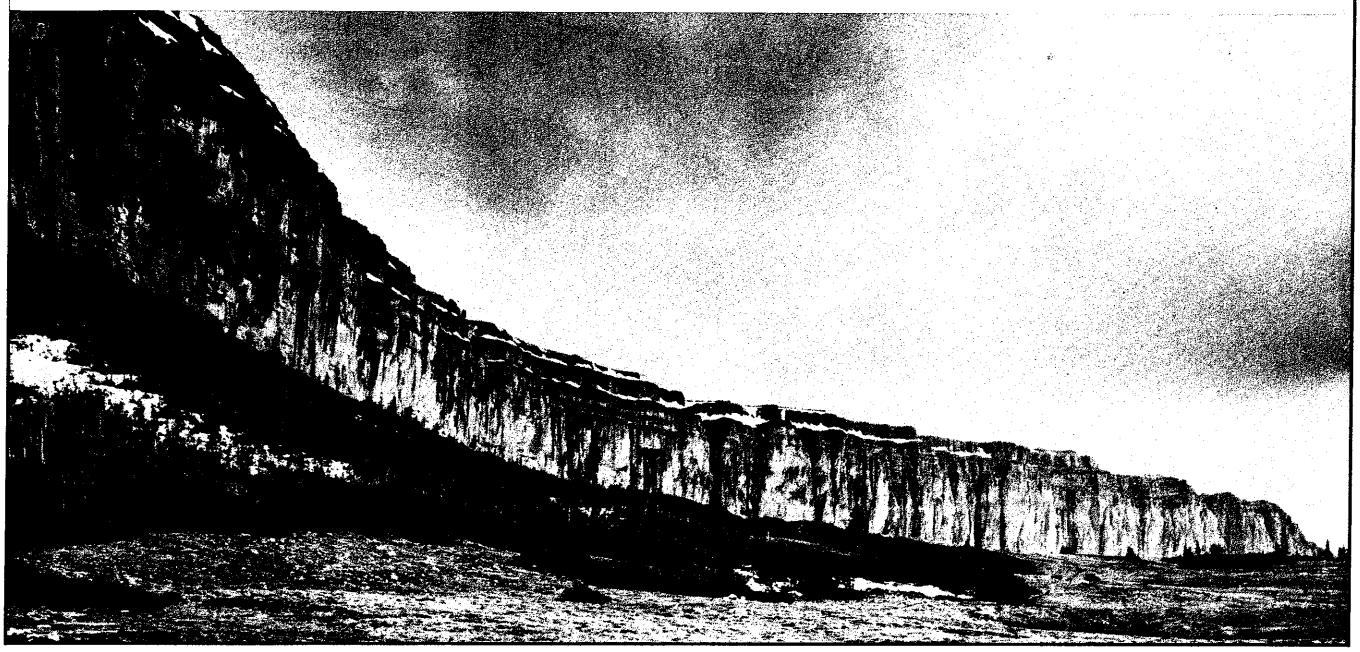

Scapegoat Mountain, Bob Marshall Wilderness Complex. *Photo/Dan Dodge*

Limits of Acceptable Change: A New Framework for Managing the Bob Marshall Wilderness Complex

George H. Stankey, Stephen F. McCool and Gerald L. Stokes

The Bob Marshall Wilderness has been aptly described as the "flagship" of the American wilderness preservation system. Along with the adjacent Great Bear and Scapegoat Wildernesses, the "Bob," as it is known locally, forms the core of a 1.6 million acre block of spectacular wild country. From the awesome Chinese Wall to the grizzly bear that roam throughout the area, the Bob Marshall Wilderness Complex (BMWC) possesses much of what we commonly ascribe to wilderness. And each year thousands of visitors come to the area to backpack, white water raft, or hunt big game. The BMWC is truly a national treasure.

But those values and features that give the BMWC its special place in America's wilderness system are threatened. Managers, users, citizens and scientists all have expressed concern that increasing demands on the Complex could damage the area's vegetation, soil, water and wildlife; moreover, the growing numbers of users make it increasingly difficult to provide the kinds of outstanding opportunities for solitude described in the 1964 Wilderness Act.

In addition to increasing use pressure on

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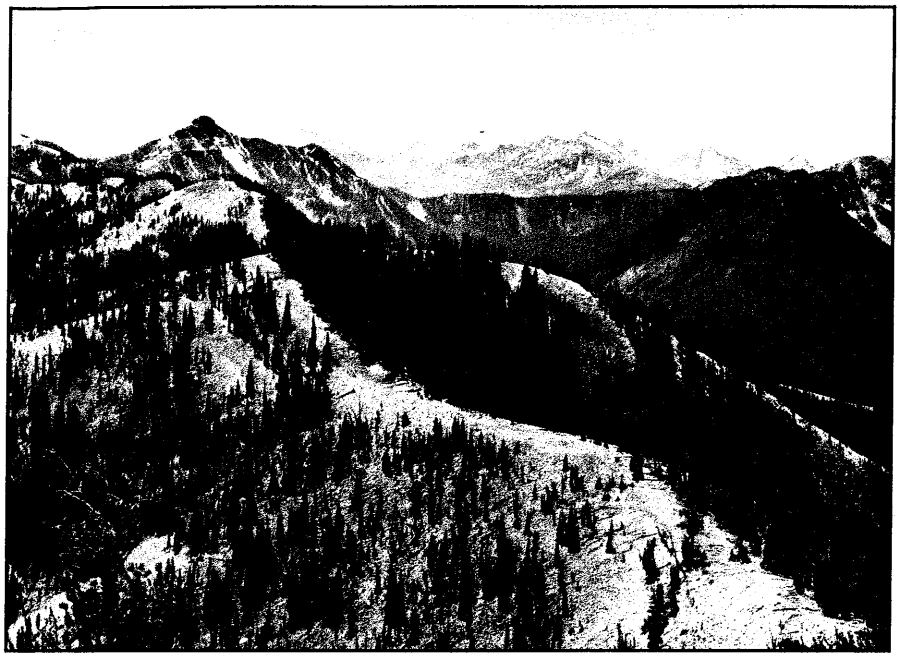

Picture Ridge from Picture Peak, Bob Marshall Wilderness. *Photo/Don Dodge*

the BMWC, changing legislative guidelines also demand that managers move to resolve the issue of "How much is too much?" For example, regulations implementing the National Forest Management Act require national forest plans to "provide for limiting and distributing visitor use of specific portions in accord with periodic estimates of the maximum levels of use that allow natural processes to operate freely and that do not impair the values for which wilderness areas were created."

But while the pressures confronting the BMWC are severe, they are by no means unique. Many wildernesses today throughout the country face similar problems, and managers, interested citizens and others are working on means to implement effective management to protect the environmental and experiential qualities that characterize wilderness.

The carrying capacity approach to wilderness management, drawn from range and wildlife management, holds an appealing simplicity. If some specific use level actually signals the onset of environmental deterioration and unsatisfactory recreational experiences, it could be said that an area is exceeding its carrying capacity when it exceeds that level. Wilderness managers would have a clear, unequivocal basis for restricting use.

Considerable research has been done on the carrying capacity model and its ability to help provide managers with the information necessary to make decisions about appropriate use levels. Both ecological and social studies focused on the level of use at which unacceptable impacts begin. However, this focus was hampered by the lack of a clear and predictable relationship between use and impact. In some environmental settings, even low use levels can produce substantial impacts on vegetation and soils; in other locations, such resources are very resilient. Some recreational experiences, such as the search for solitude, are adversely affected by increased use levels; others, such as physical exercise, are not.

Developing a straightforward understanding of the use-impact relationship was also confounded by what we might call the "it all depends" syndrome. A certain amount of use in a particular environmental setting would lead to a certain level of impact, depending on the weather or on the specific kind of recreational use taking place. A certain number of encounters per day would provoke a particular reaction from people, depending on where the encounters occurred or how the people behaved. The virtually infinite number of factors upon which the use-impact relationship depended makes it very difficult to arrive at answers that could be used by managers.

However, the basic difficulty grew out of the focus on "How much is too much?" Increasingly, researchers and managers came to realize that this was the wrong question. Rather than attempting to discover this elusive number, it became apparent that attention should be focused on what kinds of conditions were desired. Conditions included the state of the resource—the quality of vegetation at campsites or forage in meadows, water quality and other measures, as well as the nature of the experience—the encounters with others while traveling or at the campsite, for example. By focusing on the conditions desired, we could then begin to look at how much and what kinds of use would be consistent with their maintenance.

This shift in attention from an appropriate use level to the desired condition underlies our revised approach to the recreational carrying capacity issue.

This approach—the limits of acceptable change (LAC)—represents a framework within which decisions can be made about the kinds of conditions that will be permitted to occur in an area. We will also look at how the LAC framework has been used to address recreation impacts and issues in the BMWC and how it integrates with the political environment within which decisions about wilderness resources are made.

The basic premise of the LAC concept is that change is a natural, inevitable consequence of recreation use. Both environmental and social changes are involved. Acceptance of this premise immediately redefines the traditional question about carrying capacity from "How much use is too much?" to "How much change is acceptable?"

The LAC framework recognizes the inevitable impacts that occur as a result of human use. Wilderness managers might want to retain pristine conditions throughout an area, but the reality is that once use occurs, resource conditions begin to change—soils are compacted, vegetation is disturbed. Similarly, social conditions change—interparty contacts rise, conflicts increase. The nature and extent of these changes will vary throughout an area because of differences in types and amount of use, susceptibility of vegetation and soils to use pressure and other factors. This does not imply that a decision could not be made to prohibit change caused by recreation; such a decision would, however, necessitate a virtual prohibition of recreational use.

The shift in focus from "how much use" to "how much change" carries with it two important implications. First, it directs attention from use level as the key management concern to the environmental and social conditions desired in wilderness. The link between use level and conditions is complex; moreover, the previous focus on use level only partially explained and helped manage human-induced change. The new orientation focuses directly on managing for desired conditions rather than on how recreation use *per se* should be managed.

The second implication of the LAC management framework is that it clearly places the issue of capacity in a prescriptive as opposed to a technical context. Tradi-

tionally, the task was to define the level of use beyond which excessive impact would occur. Such an approach contributed to the belief that establishing capacity was a technical procedure requiring an understanding of the relationship between use and change. However, the LAC framework, with its focus on desired conditions, immediately addresses the matter of *acceptable change,* and the answer to such a question is ultimately one of personal judgment, not science. Judgements of acceptability require not only the viewpoints of managers and researchers but of citizens as well.

Of course, technical information and understanding remain an important part of the LAC process. It is critical that we understand the technical processes of energy flow in wilderness ecosystems and the complex relationships between recreational use and vegetative impact. However, the LAC process treats such information as an aid in answering what is acceptable, not as a determinant.

Explicit recognition of the importance of providing diverse wilderness conditions in the BMWC and the implementation of management actions to achieve or maintain conditions form the basis of the LAC framework. Given that any use produces at least some change, the process requires managers to identify where, and to what extent, varying degrees of change are appropriate and acceptable. The conditions that characterize a particular type of opportunity and that distinguish it from others are specified by measurable objectives that define the limits of acceptable change (Lime 1970, Frissell and Stankey 1972).

We talk about "acceptable" change. The word "acceptable" has been purposely selected because it emphasizes the idea that the amount of change that occurs reflects a judgement made about its appropriateness. Other words might have been chosen, such as "unavoidable." A word like "unavoidable" implies there is a discrete predictable amount of change associated with a given use level, beyond which no further change should occur. However, this is simply not an accurate portrayal of the way things work.

To implement the LAC framework, managers proceed through nine interrelated steps (Figure 1). Briefly, these steps involve the following:

1) Identify area issues and concerns. Citizens and managers meet to identify what special features or qualities within the area require attention, what management problems or concerns have to be dealt with, what issues the public considers important in the area's management, and what role the area plays in both a regional and national context. This step encourages a better understanding of the wilderness resource, a general concept of how the resource should be managed and a focus on principal management issues. Issues such as outfitter allocation, horse and trail management, threatened and endangered species and opportunities for solitude were identified as important in the BMWC.

2) Define and describe wilderness recreation opportunity classes. Any wilderness area contains a diversity of physical-biological features, use levels, evidence of recreation and other human uses, and type of wilderness experiences. The type of management needed will also vary throughout an area. Opportunity classes describe subdivisions or zones of wilderness where different resource, social and managerial conditions will be maintained. These classes represent a way of defining a range of diverse conditions within the wilderness. And while diversity is the objective here, it is important to point out that the conditions found in all cases must be consistent with the area's designation as wilderness. The definition of opportunity classes is not an excuse to maintain conditions inappropriate in a wilderness.

In step 2, we define the number of classes that will be managed and develop general descriptions of the kinds of resource, social, and managerial conditions appropriate to each. For example, Table 1 shows the resource and social settings identified as appropriate in each of four opportunity classes in the BMWC, ranging from pristine conditions to one typified by the relatively more visible impacts of human use. Again, such classes serve as management objectives for specific areas of the wilderness.

3) Select indicators of resource and social conditions. Indicators are specific elements of the resource and social setting selected to represent (or to be "indicative of") the conditions deemed appropriate and acceptable in each opportunity class. Because it is impossible to measure the condition of and change in every resource and social feature in a wilderness, we select a few indicators as measures of the overall condition or "health" of the area. Examples would include amount of bare ground at campsites or average number of other groups encountered per day. They should be easy to measure quantitatively, related to

Figure 1

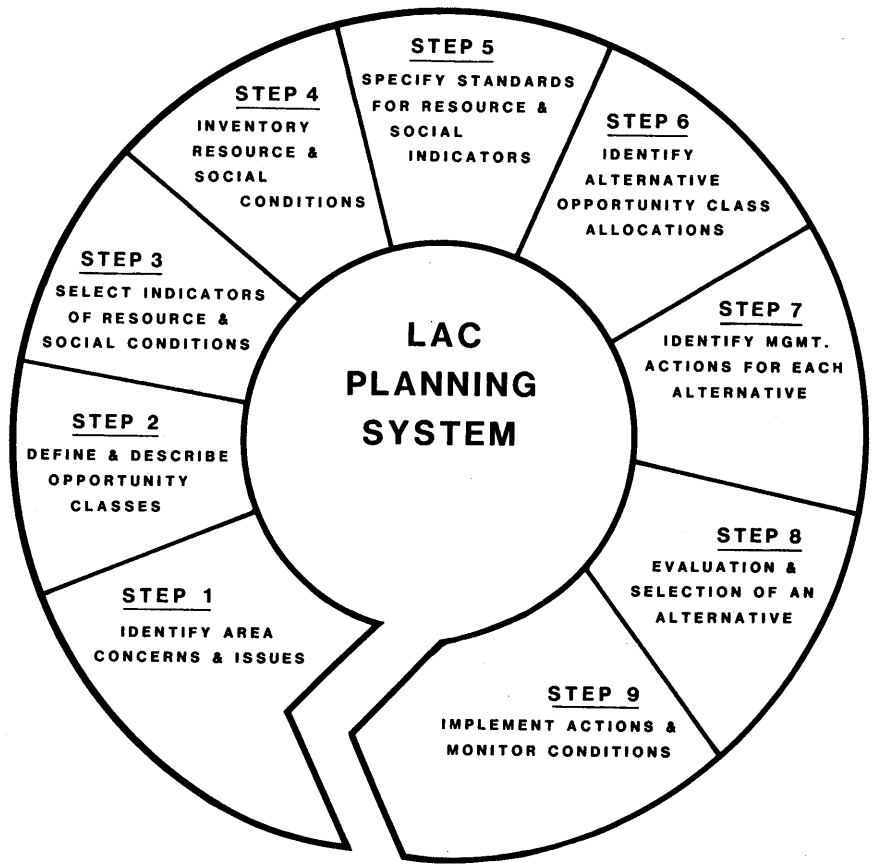

Table 1
Brief Descriptions of Wilderness Recreation Opportunity Classes in LAC Planning for the Bob Marshall Complex

	MOST PRISTINE			LEAST PRISTINE
	Opportunity Class I	Opportunity Class II	Opportunity Class III	Opportunity Class IV
RESOURCE SETTING: (General description)	Unmodified natural environment	Unmodified natural environment	Unmodified natural environment	Predominantly unmodified natural environment
Ecological conditions	Not measurably affected by the action of users	Minimally affected by the action of users	Moderately affected by the action of users	Many locations substantially affected by the action of users
Prevalence and duration of impact	Temporary loss of vegetation where camping occurs and along some travel routes. Typically recovers on an annual basis.	Minor loss of vegetation where camping occurs and along most travel routes. Most impacts recover on an annual basis.	Moderate loss of vegetation where camping occurs and along most travel routes. Impacts in some areas persist from year to year.	Moderate loss of vegetation and soil on major travel routes, campsites, and popular lakeshores. Impacts persist from year to year.
Visibility of impacts	Not apparent to most visitors	Apparent to only a low number of visitors	Apparent to a moderate number of visitors	Impacts are readily apparent to most visitors
SOCIAL SETTING: (General description)	Outstanding opportunity for isolation and solitude	High opportunity for isolation and solitude	Moderate opportunities for isolation and solitude	Moderate to low opportunities for isolation and solitude
General level of encounters	Very infrequent	Low	Moderate	Moderate-high
Interparty contacts while traveling	Very few	Low	Moderately frequent	Relatively high
Interparty contacts at the campsite	Nonexistent	Fairly low	Moderately frequent	Common

the conditions specified by the opportunity classes and reflect changes in recreation use.

Indicators are an important part of the LAC process because their condition reflects the overall conditions found throughout an opportunity class. It is important to understand that an individual indicator might not adequately depict the condition of a particular area. It is the "bundle" of indicators that is used to monitor an area.

4) Inventory existing resource and social conditions. Inventories can be a time-consuming and expensive part of planning. In the LAC framework, the inventory is guided by the indicators selected in step 3. Other factors, such as bridges, lookout towers, outfitter base camps and critical habitat, can also be inventoried. This information will be helpful later when the consequences of various alternatives are being evaluated. The inventory data are mapped so that both the condition and location of the indicators are known. The inventory provides a measure of the indicators' existing condition throughout the area, as well as a data base from which managers can formulate the standards for each indicator in each opportunity class.

5) Specify standards for resource and social conditions in each opportunity class. Here we identify the range of conditions for each indicator considered appropriate and acceptable for each opportunity class. By defining those conditions in measurable terms, we provide the basis for establishing a distinctive, diverse range of wilderness opportunities. Standards serve to define the "limits of acceptable change." They are the maximum permissible conditions that will be allowed in a specific opportunity class; they are not necessarily objectives. In the BMWC, for example, where four opportunity classes have been defined, standards for campsite solitude and other indicators have been proposed.

The inventory data collected in step 4 play an important role in setting standards. We want the standards defining the range of acceptable conditions in each opportunity class to be realistic and attainable; we also want them to do more than mimic existing conditions. Standards play a critical role of indicating when restoration or enhancement might be needed.

6) Identify alternative opportunity class allocations reflecting area-wide issues and concerns and existing resource and social conditions. Most wildernesses could be managed in several different ways and still retain their basic wilderness qualities. In step 6, we begin to identify some of these different alternatives. Using information from step 1 (area issues and concerns) and step 4 (inventory of existing conditions), managers and citizens can begin to explore how well different opportunity class allocations meet varying interests, concerns and values. For example, in the BMWC planning effort, one alternative allocated a large proportion of the area to those opportunity classes in which impact is least acceptable. However, another alternative gives greater emphasis to those opportunity classes where higher impact levels are acceptable. Yet another alternative featured maintenance of the *status quo*.

7) Identify management actions for each alternative. The alternative allocations proposed in step 6 are only the first step in the process of developing a preferred alternative. In addition to the kinds of conditions

that would be achieved, both managers and citizens need to know what management actions will be needed to achieve the desired conditions. In a sense, step 7 requires an analysis of the costs, broadly defined, that will be imposed by each alternative. For example, many people might find attractive an alternative that calls for restoration of much of the area to a pristine character. However, such an alternative might necessitate introduction of strict use rationing, prohibition of horses and closure of some areas. In light of such costs, the alternative might not seem as attractive.

Step 7 provides a measure of what it will take to move the area from its existing condition to that desired. Management actions for the BMWC include information, education, campsite closure and rehabilitation, increased enforcement of regulations and some restrictions on party size. The action proposed for a specific area varies according to the opportunity class and intensity of the problem.

8) Evaluation and selection of a preferred alternative. With the various costs and benefits before them, citizens and managers can proceed to evaluate the various alternatives, and the managing authority will then select a preferred alternative. Evaluation must take many factors into consideration, but examples would include the responsiveness of each alternative to the issues and concerns indentified in step 1 and the management requirements identified in step 7. It is important that the factors figuring into the evaluation process and their relative importance be made explicit and available for public review.

9) Implement actions and monitor conditions. With an alternative finally selected, the necessary management actions (if any) are put into effect and a monitoring program instituted. The monitoring program focuses on the indicators selected in step 3 and compares their condition with those identified in the standards. This information reflects the success of the actions. If conditions are not improving, the intensity of the management effort might need to be increased or new actions implemented.

These nine steps comprise the LAC framework. By identifying desired conditions in a precise, measurable way, the LAC system would avoid the lack of specificity and "motherhood" nature of many previous management plans. But the LAC is, in many ways, still theory or at least an untested and unproven approach. Will it really work?

The verdict is not in and might not be for some time. The application of the LAC framework in the three wildernesses comprising the BMWC represents the first complete test of the system. The effort involves the four national forests that manage the area (Flathead, Helena, Lewis and Clark and Lolo), the Wilderness Management Research Unit of the Intermountain Forest and Range Experiment Station and a wide range of wilderness interest groups.

Because of the area's size and complexity, as well as the intense public interest in its management, it has been necessary to develop some special approaches to help guide application of the LAC. Many of the ongoing duties involved with working through the process have been placed in the hands of a contracted consultant who acts as a facilitator, thus freeing national forest staff from many of the logistical details involved in developing proposed management actions for such a large area. The facilitator also acts as a neutral party in the process in an attempt to bring public interest groups into the early steps of the LAC process. Because many of these groups ultimately will be affected by the results of the process, they have been encouraged to provide their experience and knowledge in the effort to develop a preferred alternative.

Managers still play a key role as members of a core team that meets periodically to discuss details of the process, information needs and the commitment of organizational resources. The facilitator identifies responsibilities for these individuals as well as decisions for which they are ultimately responsible.

In addition to the core team, a larger task force also has been established. The task force is composed of researchers, Forest Service personnel and individuals representing organized and unorganized interests in the Bob Marshall Complex. The task force was organized in this way to encourage dialogue and mutual learning (Friedman 1973) among individuals with different types of expertise.

The task force provides continuing public participation in the LAC process. It is a means of informing citizens about the process and gaining their understanding and support. A basic precept underlying formation of the task force is that a substantial, important body of expertise exists within the citizenry. Another precept is that without public understanding and support, the process is unlikely to succeed. This is a particularly important notion, for it is consistent with the growing realization that resource planning is ultimately a political rather than a technical process. Although managers' technical skills are clearly needed, they must be coupled with a level of political competence that insures understanding of the various interest groups and their beliefs, values and motives (Cortner and Richards 1983). Such understanding helps managers negotiate planning direction so that the various interests are dealt with in a reasonable and responsible fashion. By being responsive to the expertise and concerns of various interest groups, planning has a better chance of success (Culhane and Friesema 1979). Finally, the task force represents a microcosm of the political marketplace. The diversity of interest groups represented insures that all values and viewpoints will be addressed in the planning process. The "ownership" felt by individuals working cooperatively should also ensure that the plan is implemented.

There has been much frustration with wilderness planning in the past, and the shelves are filled with documents that never saw the light of day. Will the LAC framework change this or is a similar fate in store? Obviously, we will have to wait and see. However, the integral role of public participation in developing the LAC process, coupled with the specificity of the conditions that managers and citizens identify as desirable, should help provide a level of accountability often lacking in past plans.

For those interested in the details of the LAC process, an expanded version of this article will soon be available as a General Technical Report entitled The Limits of Acceptable Change System for Wilderness Planning. *Copies can be obtained from the Intermountain Forest and Range Experiment Station, 507 25th St., Odgen, Utah, 84401.*

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