

Beyond Wilderness: Broadening the Applicability of Limits of Acceptable Change

Mark W. Brunson

Abstract—The Limits of Acceptable Change (LAC) process helps managers preserve wilderness attributes along with recreation opportunities. Ecosystem management likewise requires managers to balance societal and ecosystem needs. Both are more likely to succeed through collaborative planning. Consequently, LAC can offer a conceptual framework for achieving sustainable solutions outside protected areas. Nonwilderness management has more complex objectives and constituencies, but the basic progression of issue identification, standard-setting, impact monitoring, and strategies for mitigating unacceptable impacts can be applied nonetheless. A major conceptual shift is required, however, in that the objective of ecosystem management often is not to restrict anthropogenic change but to direct it.

The Limits of Acceptable Change (LAC) process for wilderness planning was devised because managers found it increasingly difficult to balance the often-conflicting mandates of the Wilderness Act to administer lands “for the use and enjoyment of the American people” while providing “for the protection of these areas, the preservation of their wilderness character” (16 U.S.C. §1131(a)). Accordingly a planning process was developed that accounted for the reality that anthropogenic change is inevitable wherever human activity is encouraged, yet established the protection of nonhuman ecosystem elements as a primary management goal. Management strategies based on LAC planning are *adaptive*, that is, they call for ongoing observation of the interactions between humans and the wilderness environment, and they provide mechanisms to quickly change strategies if observed conditions do not match desired outcomes (Stankey and others 1985). Moreover, LAC plans are said to be most viable—that is, most likely to be ecologically and socially sustainable—when they are developed with the participation of constituency groups to ensure broad public scrutiny of planning objectives and management standards (McCoy and others 1995).

The same goal of socioeconomic and ecological sustainability has become central to the task of U.S. public land management in general, both within and outside wilderness. Many public land agencies in North America have adopted ecosystem management, which differs from previous approaches by focusing more attention on ecological

properties of landscapes and encourages the integration of a wider range of societal values into a multiple-use framework (Salwasser 1994). Like LAC-based plans for wilderness management, ecosystem management strategies are supposed to be adaptive—entailing a process of learning from experience whereby we increase our understanding of the reciprocal relationship between natural systems and social systems across time and space (Lee 1993). And typically they incorporate collaborative planning efforts involving diverse constituencies who are charged with finding achievable, mutually agreed-upon goals for conditions of a landscape of common interest (Muckenfuss 1994; Swanson 1994).

Given that the goals and strategies of ecosystem management are similar to those of wilderness management, LAC planning may provide a framework for developing ecosystem management strategies outside wilderness and protected areas. This is important because agencies charged with facilitating ecosystem management collaboration are struggling to find processes appropriate to that purpose (Brunson and Richardson 1997; Torell 1993). It is entirely possible that the required expertise already resides in their wilderness management staffs. Accordingly, this paper examines the applicability of LAC beyond protected areas, with particular attention paid to issues of increased management complexity, meanings of “acceptability,” and conceptual or procedural adaptations for nonwilderness lands.

Broadening the Scope of LAC

Nonwilderness Applications

Although LAC was originally envisioned as a tool specific to problems of wilderness management, its application has broadened slowly but surely in the ensuing 15 years. In 1989 a plan developed for the Arapaho-Roosevelt National Forest applied the LAC model to campsites and day-use areas in the Poudre Wild and Scenic River in Colorado. Most of the area fell into the Roaded Natural category of the Recreation Opportunity Spectrum. The indicators chosen were ones that previously had been applied successfully in wilderness (amount of vegetative cover; tree damage; bare ground; existence/extensiveness of access trails; user modification; amounts of litter, wastes, and vandalism), and standards were set at levels similar to those for heavily used wilderness areas (Brunson and Rodriguez 1992).

The Poudre plan applied LAC in a protected-area setting that, though in the “front country,” is legally similar to wilderness. A more widespread application of an LAC-type process is the National Park Service’s Visitor Experience and Resource Protection (VERP) process, which also is

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Mark W. Brunson is Associate Professor, Department of Forest Resources, Utah State University, Logan, UT 84322-5215.

intended as a way for managers to meet objectives for desired ecological and social conditions, but can be applied to the full gamut of National Park settings. Like LAC, VERP requires a baseline assessment of natural resource conditions and visitor experiences, establishes desired conditions for a range of management zones, uses monitoring to compare observed impacts with standards for conditions, and develops strategies for addressing discrepancies between impacts and standards (Manning and others 1996). VERP differs from LAC in some particulars, including a heavy emphasis on “recreation carrying capacities” and virtually no provision for participatory planning, but its general structure is quite similar to LAC.

An LAC application outside of protected areas was made in 1992 by the Payette National Forest, which used an LAC process to develop a winter recreation plan for ranger districts headquartered in McCall and New Meadows, ID (Fitch 1993). Issues addressed by the plan included some outside the scope of wilderness planning, such as conflict between motorized and nonmotorized users. Although some LAC steps were curtailed in the Payette process—for example, existing recreation inventory data were used in lieu of an inventory of current resource and social conditions—the process was chosen as a general outline for the winter recreation planning process because it offered a tested framework for collaborative planning. In general, participants considered the LAC approach a successful one and supported its broader use in recreation planning (Fitch 1993).

Other nonwilderness LAC efforts include an application to a Bureau of Land Management area of critical environmental concern (ACEC) along the South Fork of the Snake River in southeastern Idaho, where riparian protection was a principal concern. Undoubtedly there have been other attempts at applying LAC outside wilderness, with varying degrees of success. Unfortunately, field-level managers rarely have the opportunity to document those efforts and disseminate the results of their experiences to the wider audience of Federal, State, and international wildland managers who might benefit by them. Research that assembles and synthesizes these case histories might be especially helpful to managers seeking to apply LAC outside wilderness.

Difficulties of Nonwilderness LAC

One barrier to nonwilderness applications of LAC planning may be that managers traditionally have thought of wilderness management as a separate task from multiple-use management. To some extent this distinction is unwarranted because wilderness areas are multiple-use under the legal definitions in both the Multiple Use Sustained Yield Act of 1960 (MUSYA) and Federal Land Policy and Management Act of 1976 (FLPMA). In both laws, multiple-use means making “the most judicious use of the land” and that “some land will be used for less than all of the resources” (16 U.S.C. §531(a); 43 U.S.C. 1702(c)). The FLPMA further requires land managers to take into account “the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historical values” (43 U.S.C.,

§1702(c)). With the exception of timber and minerals, those resources are explicitly included in descriptions of wilderness management in the 1964 Wilderness Act or subsequent laws. Wilderness is “multiple use.”

Nonetheless, nonwilderness management issues are clearly more complex, given the broader spectrum of allowable uses. Cole and Stankey (this proceedings) have conceptualized LAC as a process that focuses on the tension between opposing goals of providing access to primitive recreation and protecting wilderness resources from human impacts. Their bipolar model can quickly seem unmanageable when there are three or more management goals for a landscape, and those goals are at least partially incompatible. A potential resolution to this dilemma lies in development of an LAC process that establishes a hierarchy among incompatible goals, thus defining which will be the ultimately constraining factor within each potential pair of goals. (This idea is discussed in detail below.)

A chief difference between wilderness and nonwilderness planning is that the latter has heightened potential for conflict between constituency groups. Floyd (1993) suggests that land use conflicts are most intense where there are legitimate demands for both nonrenewable commodities and preservation amenities. In subsequent tests of his conflict model, he found that it predicted intensity of conflict well *except* that conflicts over motorized versus nonmotorized recreation uses were more intense than predicted (Germain and Floyd 1996). We can expect conflicts to be more intractable in ecosystem management applications of LAC than in wilderness applications. Still, that is primarily a problem with the collaborative planning element of LAC, not with the process itself, and collaborative planning will occur for ecosystem management regardless of whether LAC or another approach is used.

Another significant problem is that management of nonwilderness resources often is subject to vague or conflicting legislative mandates (Brunson and Rodriguez 1992). Because “multiple use” does not mean that all allowable uses must be provided everywhere, disputes over planning for multiple-use landscapes may focus on whether a particular use is acceptable at all—a much more intractable issue than deciding levels of impacts that are acceptable for allowable uses. We may find that LAC should not be applied until a broad “desired future condition” for a landscape is determined that includes a description of allowable uses. At that point, LAC may be helpful for establishing specific aspects of that condition, and for setting forth management strategies to preserve that condition.

Some legal mandates appear inherently contradictory, making the legal basis for planning objectives less clear. LAC processes may be especially useful in such situations. For example, when Congress established the Arapaho National Recreation Area in Colorado, it called for the “conservation and development of the scenic, natural, historic, and pastoral values of the area,” and also provided for mining, timber harvest, and grazing where it will not “substantially impair the purposes for which the recreation area is established.” The law did not provide much guidance on how to ensure that “conservation” and “development” are compatible, nor on how to determine when commodity development impairs recreation purposes beyond the intent of Congress.

LAC was developed for just that kind of ambiguity, which is inherent in the use/preservation mandate for wilderness management. An LAC process might be precisely the best method for determining acceptable impact levels for mining, logging, or grazing that preserve the recreation purposes of the National Recreation Area.

Another practical problem with widespread application of LAC is that it requires monitoring of a broader spectrum of indicators over a wider geographic area. In times of tight budgets, funds for such monitoring may be hard to come by. Moreover, it may be difficult to train personnel in the skills necessary to measure such a wide range of indicators. However, these are difficulties inherent in any adaptive management effort, including but not limited to LAC processes, and will plague ecosystem managers whether LAC is used or not.

What is “Acceptable”?

LAC entails a fundamental acknowledgment of the notion that, while anthropogenic change in wilderness is undesirable both philosophically and legally, it is also inevitable in light of the policy and management goal of providing human benefits through wilderness use. For that reason, LAC processes seek to define degrees of anthropogenic change that are “acceptable” if not desirable. Stankey and others (1985) focused on ways of achieving that goal without thoroughly examining what it means for a condition to be acceptable. When ecosystem management was similarly defined as a means for achieving “socially acceptable” conditions, Stankey and Clark (1992) argued it was time to explore what it means for a land condition or management practice to be socially acceptable.

In the limited context of wilderness, this may not be difficult because anthropogenic change is generally acknowledged to be undesirable except if intended to prevent greater human impacts (as when a boardwalk is built over a boggy trail section). An “acceptable” condition is one where there is minimal change attributable to recreation or other uses, and an appropriate management strategy is necessarily one that can control the amount of anthropogenic change. Differences of opinion among wilderness users are likely to focus on the *degree* of anthropogenic change that can be accepted, but not on the *direction* of change.

That is not necessarily the case outside wilderness and protected areas. In the broader context of ecosystem management, “social acceptability” can be defined as the result of “a judgmental process by which individuals (1) compare the perceived reality with its known alternatives and (2) decide whether the “real” condition is superior, or sufficiently similar, to the most favorable alternative condition” (Brunson 1996, p. 9). In wilderness there is always a known optimal condition: that which is believed to be “natural.” Conditions that arise as a result of “natural causes” are virtually always acceptable and desirable. Conversely human acts are likely to be acceptable only if they are substantially unnoticeable.

In nonwilderness settings, natural causes may be acceptable *after the fact* as unavoidable “acts of God” that have no foreseeable alternative. However, they may not be seen as desirable; for example, a lightning-caused fire that destroys

a valuable stand of timber or a Forest Service work station. In that case the desired condition may be an unburned forest, and strategies must be planned in advance to prevent discrepancies between that condition and reality. Moreover, some constituencies may believe that natural fire in timber stands is always acceptable while other constituencies disagree. Unlike in wilderness, constituencies may agree that natural is not always best.

Acceptability is a function not only of the desirability of a condition and its imaginable alternatives, but also of the equitability and feasibility of those alternatives (Brunson 1993). In the fire prevention example, loss of the timber stand or work station can be unacceptable only if the resulting condition is both undesirable and preventable. A further consideration is whether certain individuals will be hurt by decisions made one way or the other. Equity issues are likely to be more problematic in nonwilderness than in wilderness settings, simply because there are likely to be more interests seeking “their” share. While equity concerns do arise in wilderness planning—such as when deciding how to allocate resources to outfitted versus nonoutfitted use—they are much more difficult to address when the economic sustainability of local communities is a prime concern.

LAC Adaptations for Nonwilderness Planning

A key conceptual difference between wilderness and nonwilderness LAC is the way we conceptualize change. Desired future conditions in wilderness are defined theoretically and legally by our best understanding of the range of historic (presettlement) variation that we consider “natural.” A principal goal of management is to slow or stop anthropogenic change—especially if it leads to conditions outside the range of historic variation. In nonwilderness landscapes, desired future conditions may or may not be defined by past conditions. While there is a tendency to use analyses of ecological history to define the sustainable limits of future conditions, change may be prescribed as a means to restore past conditions or to achieve a new kind of sustainable condition. The goal of management is to direct change, and that change might not only be “acceptable” but even preferable. Ironically, this may make standard-setting easier outside wilderness in some cases where the objective is not the undefinable and constantly shifting “natural” state.

For nonwilderness settings, we still seek a condition that falls within acceptable limits, but the acceptable range is likely to have two bounds rather than one. Too little change in conditions may be as unacceptable as too much change or a wrong kind of change. Accordingly, LAC standards often may be time-bounded, defined as rates of change in conditions toward a desired state, rather than as the existence or extent of unnatural conditions. Regular monitoring is especially important when determining whether change is proceeding at desired rates as well as in desired directions. Not only is it impossible to determine any rate without regular measurements, managers may not be certain whether the strategies used to produce change are likely to achieve the desired conditions.

As noted earlier, probably the greatest conceptual challenge inherent in adapting LAC to nonwilderness settings is

to accommodate a multiplicity of potentially conflicting goals. Cole and Stankey (this proceedings) point out that LAC standards describe a desired compromise between opposing goals. In so doing, managers or task force members first identify an “ultimately constraining goal” that holds a higher priority than its polar opposite. This is the goal we cannot allow to be compromised beyond a certain point, but it is also the goal that is compromised first. A standard defines how much constituents will allow that goal to be compromised. In wilderness, the ultimately constraining goal essentially is defined by law: maintenance of natural conditions. The compromise is allowed to achieve some degree of an opposing goal such as providing access to recreation or protecting adjacent nonwilderness resources against fire damage.

This same approach can be applied to multiple-use LAC processes, but standards must address each of the compromises that may have to occur between pairs of opposing goals. For example, if goals for a landscape include timber harvesting, forage production, off-road recreation, protecting wildlife diversity, and conserving rare plant species, care must be taken to ensure that standards are established that define the acceptable compromise between wildlife and timber, wildlife and livestock forage, wildlife and off-road vehicle use, wildlife and plants of particular interest, timber and forage, and so on.

Some of the hottest debates during a nonwilderness LAC process may hinge on deciding which goal in a pair is ultimately constraining. Is it more important in the landscape of interest to produce timber or scenery? Is the primary purpose of an area to maintain high-quality riparian vegetation or produce forage of livestock? In some cases it may be possible for LAC task groups to devise a process for ranking all goals, thereby establishing the higher priority goal within each pair. At other times, the task group will have to consider each pair separately. Either way, standards must be based on consideration of interactions within each pair of goals to ensure that the standards selected can address the kinds of impacts produced by activities occurring in pursuit of the lower priority goal.

Some assistance in the prioritization process will come, as in the case of wilderness, from legal or administrative precedents that predetermine goal priorities. For example, the Endangered Species Act (16 U.S.C. §1531-43) dictates that in any pair of goals involving protected plants or animals, the ultimately constraining goal must be to meet the habitat needs of that species. Yet the law and associated regulations also explicitly allow for compromise to exist. The negotiation of such compromises is the essence of the Habitat Conservation Plan process (Larmer 1997). Other legal direction for goal prioritization may be found in laws protecting cultural resources, creating special recreation designations such as a Wild and Scenic River, or preventing discrimination against disabled persons.

Similarly, administrative direction for choosing an ultimately constraining goal is provided in the rules for maintaining visual quality and making recreation opportunity spectrum (ROS) allocations, which essentially determine that extractive uses can occur within designated zones only if they do not exceed limits defined by ROS or visual guidelines.

Skeptics reading the last example may note that extractive activities have exceeded ROS and visual quality

guidelines relatively often, and when discrepancies are called to an agency’s attention the response often is to change the ROS or visual quality designation. This is likely to be an ongoing problem whenever there is no legal basis for determining priorities within goal pairs. It may be best if this problem is addressed explicitly during the stage of the process in which strategies are chosen for ameliorating violations of LAC standards.

Despite the greater conceptual complexity, there may be little procedural difference between wilderness and nonwilderness LAC processes. Any adaptive processes for planning and management entail several stages including issue identification, inventory of existing conditions, identification of standards necessary to maintain desired conditions, monitoring, and developing and (if necessary) implementing strategies for mitigating impacts that lead to unacceptable conditions. Each of these is included in one or more steps of the LAC process. However, some steps in a nonwilderness LAC process may require more time to complete because of the multiplicity of goals to be considered and the often-greater difficulty of reaching a consensus on what those goals should be.

For example, one might need a more comprehensive scoping process, involving a broader range of constituencies, to identify area concerns and issues in multiple-use landscapes. The range of opportunity classes or “prescriptive management zones” (Cole and McCool, this proceedings) is likely to be larger in nonwilderness LAC plans, although the landscapes appropriate to ecosystem management may be smaller than many wildernesses. Prescriptions may be expressed best in terms of combinations of allowable uses (such as motorized dispersed recreation plus grazing plus timber production in one zone, motorized recreation plus grazing without timber production in another), although other criteria may be developed through collaborative discussions. This process of reaching consensus on goals or desired conditions for each prescriptive management zone is the core effort of any strategic planning effort under ecosystem management, and must be conducted without the “safety net” of the Wilderness Act, which greatly restricts the range of potentially acceptable conditions.

Because there will be more goals in most multiple-use situations, attention must be paid to a broader range of potential conditions. Planning groups may select indicators of resource and social conditions that are not commonly used in LAC processes (such as rates of change in range condition trend or allowable animal unit months; habitat suitability index thresholds or rates of improvement in habitat effectiveness). Social indicators may include ones that describe conditions outside the landscape itself but in affected communities (such as teen unemployment rates; percentage of homes heating with fuelwood). For the most part, these are already in use—or being evaluated for use—in ecosystem management and should be entirely compatible with LAC.

Developing standards for those indicators should flow from the process of identifying desired conditions for each prescriptive management zone. Standards must be set that fit scientific or economic or social realities, are amenable to measurement under realistic monitoring conditions, and are believed to achieve the desired condition even if that entails change from existing conditions. It is likely that these will be identified by professionals within specific

professional disciplines after LAC work groups have defined the desired condition in more qualitative terms. Other steps—conducting baseline inventories, identifying and selecting management alternatives for ameliorating unacceptable impacts or rates of change, and monitoring—will be part of any ecosystem management process whether LAC is used or not.

In summary, the Limits of Acceptable Change approach to planning is one of several planning frameworks that can incorporate collaborative planning and methods of goal-setting and impact and standard comparison to manage adaptively to achieve ecologically and socially sustainable landscapes. While there will be conceptual adjustments necessary to apply LAC in ecosystem management situations—primarily in the ways we think about change and in the care that must be taken to examine impacts and priorities within pairs of opposing goals—these are not incompatible with the overall LAC approach. The advantage of using LAC is that we already have a substantial cadre of agency employees who are experienced with the method and may feel comfortable applying it to a wide range of landscapes.

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