

APPENDIX D

LIMITS OF ACCEPTABLE CHANGE

Introduction

As developed by George Stankey and others (1985), using Limits of Acceptable Change (LAC) is a process that requires deciding what kinds of conditions are acceptable in recreational settings, then prescribing actions to protect or achieve those conditions. The objective of the LAC system is not to prevent change but rather to control it, and to decide what management actions are required to maintain or enhance the desired conditions.

The LAC process consists of four major components: (1) specifying acceptable and achievable resource and social conditions, defined by a series of measurable parameters, (2) analyzing of the relationships between existing conditions and those judged acceptable, (3) identifying management actions necessary to achieve these conditions, and (4) a program of monitoring and evaluating management effectiveness. These four components are broken down into nine steps to ease application. Each of the nine steps is designed to achieve a particular task and provide the basis for later activities.

By following the LAC process, managers, with public input, identify issues and concerns that need to be resolved through the land-use planning and environmental assessment processes. First they define opportunity classes, select resource and social indicators, and inventory the planning area to determine current indicator status. After this inventory, managers specify standards for the indicators within each opportunity class. The management actions needed to maintain resource and social indicators within these standards are written as prescriptions. The final phase involves monitoring the indicators and comparing the results against previous measurements and acceptable standards to see if the objectives are being achieved or maintained to the desired standard. Unacceptable change signals the need for corrective management action.

The Role of Opportunity Classes

When an area contains a diversity of physical and biological features and uses, subdivisions or opportu-

nity classes can be applied. Within diversified areas, the type of management needed is expected to vary throughout. Opportunity classes delineate zones where different resources, and social and managerial conditions will be maintained. Map D displays the four opportunity classes set for the El Malpais National Conservation Area in 1993.

The Role of Indicators

BLM managers will monitor how much change is occurring in El Malpais NCA. They will need to look at the indicators, which are specific elements of the NCA setting that change in response to human activities.

Indicators provide quantitative documentation on how much conditions have changed, serve as tools to examine trends and highlight problems, and can act as an early warning to predict future conditions. When compared with standards that describe the acceptable limits of change, indicators can signal the need for corrective action, evaluate the effectiveness of management actions, and help determine if desired NCA conditions are being achieved.

Criteria For Indicator Selection

Quantitative—Can the indicator be measured?

Correlated— Does the indicator detect a change in conditions caused by humans?

Feasible—Can the indicator be measured using simple equipment and sampling techniques?

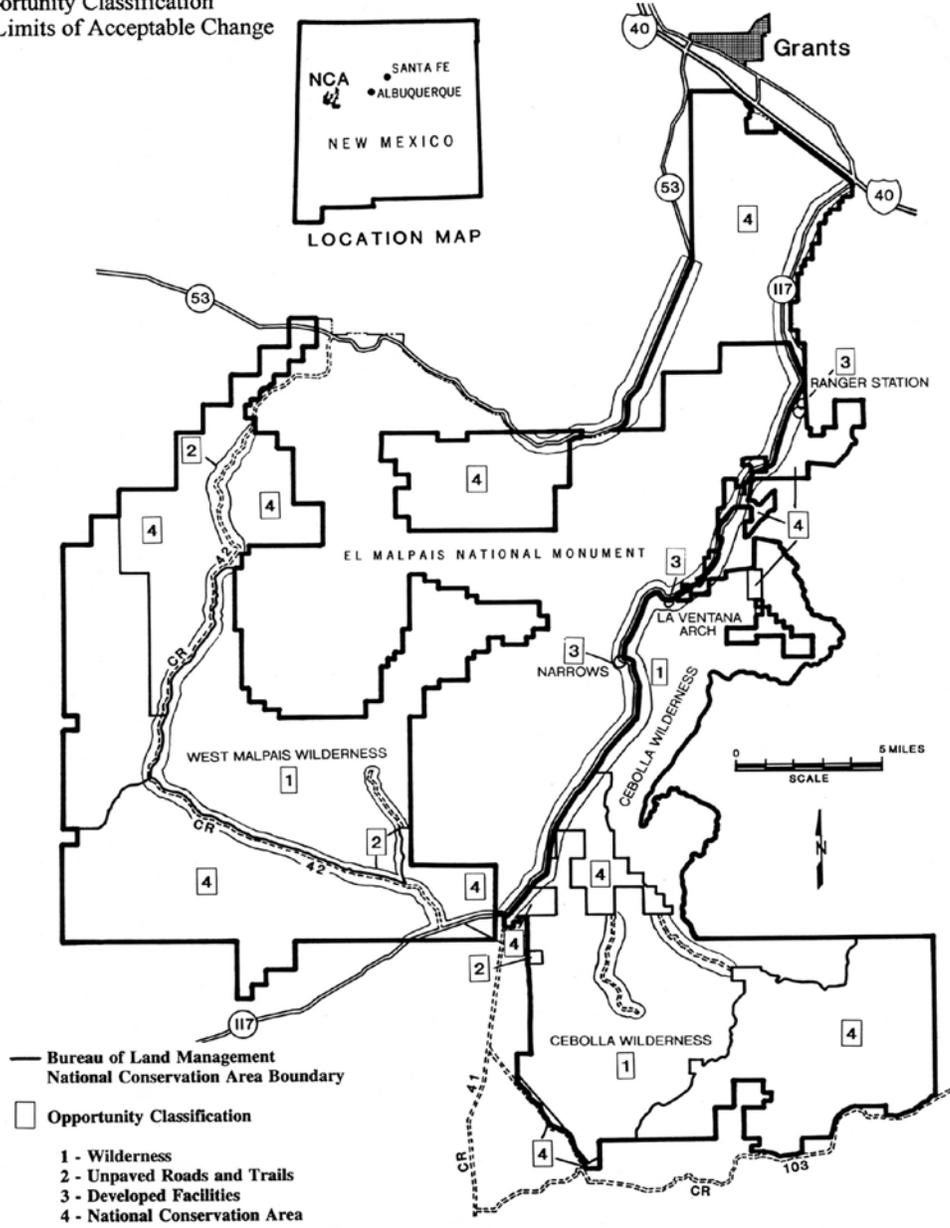
Reliable—Can the indicator be measured consistently (i.e., will different observers collect the same information)?

Responsive—Does the indicator detect a change in conditions in response to management control?

Sensitive—Can the indicator detect a change in conditions that occur within a year?

Map D

Opportunity Classification
for Limits of Acceptable Change



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Integrated—Does the indicator reflect the conditions of more elements than itself?

Early Warning Ability—Does the indicator act as an early warning, alerting managers to deteriorating conditions before unacceptable changes have occurred?

Significance—Does the indicator detect a change in conditions that persist for a long time (e.g., five years), disrupts ecosystem functioning, or reduces the future desirability of the area for visitors, researchers, grazing allottees, and other NCA users?

The Role of Standards

Standards provide a way to monitor existing and future conditions against those defined as acceptable. They establish (quantitatively, qualitatively, and judgmentally) the range of conditions or "limits of acceptable change" for each indicator.

Why Monitor?

The designation of an area as an NCA does not ensure that desired conditions will be protected, or opportunities will exist for visitors to obtain a positive recreational or wilderness experience. However, the desired NCA conditions for which the BLM strives and monitors include:

- Air quality maintained at levels that meet or exceed Federal and State standards.
- Water quality maintained at levels that protect aquatic ecosystems, and drinking water free from fecal contamination.
- Wildlife and plant species in natural distributions and abundances.
- Outstanding opportunities for diverse recreational experience within a natural setting.
- Outstanding opportunities in wilderness for solitude, challenge, self-reliance, primitive and unconfined recreation, and scientific study.
- The imprint of human activities substantially unnoticeable in wilderness.

- Natural processes operating freely in wilderness.

Various uses will inevitably cause some change in NCA conditions. Recreational use, transportation and trail systems, livestock grazing, fire suppression, exotic species introduction, air pollution, crowding, littering, and excessive regulation all can threaten the values the NCA was designated to conserve. However, change does not necessarily have to be bad. Under careful observation, some existing conditions need to change to become acceptable.

Steps in a Monitoring Program

1. Describe the area's natural and human characteristics. Identify unique area attributes. Gather all available data.
2. Identify human activities that impact conditions. Identify issues and concerns.
3. Define goals and objectives that reflect the desired NCA conditions.
4. Select indicators of environmental and experiential conditions.
5. Describe sampling and measurement methods for each indicator.
6. Specify standards for acceptable limits of change for each indicator.
7. Inventory indicator conditions and compare with standards.
8. Identify management actions in areas where conditions need to be brought up to standard.

NCA Monitoring Forms

The El Malpais NCA has been divided into four opportunity classes, as shown on Map D. Within each class, key monitoring locations have been identified. A standard form has been developed for each class to ensure consistency of data and decrease subjectivity. The following forms used for data collection show selected indicators, standards, sampling methods for collecting information, monitoring locations, and corrective actions to be taken when standards are exceeded for each opportunity class.

TABLE D-1

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I EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE							
ELEMENT	MONITORING LOCATIONS	INDICATORS	STANDARDS	VISUAL MONITORING	PHOTO-MONITORING	ACTIONS (based on present condition)	OBSERVER RECOMMENDATIONS
<p>Opportunity Classification I</p> <p>Wilderness</p> <p>Unmodified natural environment, surface disturbance small; trails acceptable; no motorized vehicles; no facilities for user convenience; little evidence of previous recreation use.</p> <p>Compare with baseline photos & data (observations)</p>	Proposed Narrows Rim Trail (Cebolla Wilderness)	Number/distribution of campsites	≤2 campsites visible within 300 feet of each campsite	Establish baseline data collection	Establish baseline inventory photos	Use "Leave No Trace" ethics	Date:
		Fire-ring density	One fire-ring/campsite	Visual observation of 100% for each site, 1 time/year	Establish 1 photo point/site where standard was exceeded	Increase patrols	Time:
	Armijo Canyon (Cebolla Wilderness)	Number of encounters with other groups/day	80% probability during all use periods of <3 other groups encountered/day while traveling along trails	Once during high-use period, May-September or hunting season	Photo-monitor sites 1 time/year	Increase interpretive effort using brochures, guided tours	Observer:
			Homestead Canyon (Cebolla Wilderness)				
	Number of unauthorized trails (leading to Narrows Rim Trail)	2 distinct trails from designated trail (leading to Narrows Rim Trail)	Restrict areas for rehabilitation	Remove undesired fire rings	Collect trash		
	Vegetative loss	Bare mineral soil ≤100 sq. ft. at desired campsites					
	Trail erosion	Location of erosion or gullying ≤1 ft. /¼ mile					

TABLE D-2

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II EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE							
ELEMENT	MONITORING LOCATIONS	INDICATORS	STANDARDS	VISUAL MONITORING	PHOTO-MONITORING	ACTIONS (based on present condition)	OBSERVER RECOMMENDATIONS
<p>Opportunity Classification II</p> <p>Unpaved roads & trails</p> <p>Frequency of contact is low to moderate on unpaved roads & trails; primitive roads & motorized use are present; small isolated structures may be present; surface disturbance is limited & small.</p> <p>Compare with baseline photos & data (observations)</p>	<p>Hole-in-the-Wall Cherry-Stemmed Road & Trailhead</p> <p>Dittert Site & Trailhead</p> <p>CR 42</p>	<p>Unauthorized trails</p>	<p>2 distinct trails from designated trail</p>	<p>Establish baseline data collection</p> <p>Visual observation of 100% for each site, 1 time/year</p> <p>Once during high-use period, May-September or hunting season</p>	<p>Establish baseline inventory photos</p> <p>Establish 1 photo point/site where standard was exceeded</p> <p>Photo-monitor sites 1 time/year</p>	<p>Use "Leave No Trace" ethics & interpretive programs</p> <p>Increase BLM patrols</p> <p>Increase signing</p> <p>Law enforcement actions</p> <p>Restrict areas for rehabilitation</p> <p>Contact County Highway Department for road maintenance (CR 42)</p> <p>Notify public at Ranger Station & Grants Field Station on road conditions for CR 42</p>	<p>Date:</p> <p>Time:</p> <p>Observer:</p>
		<p>Number of complaints concerning road or trail conditions</p>	<p>≤10 complaints/year</p>				
		<p>Road conditions presenting safety hazard (potholes, ruts)</p>	<p>Seasonally monitor road conditions annually</p>				
		<p>Damage to ROW, poor weather conditions</p>	<p>Notify County Highway Department for maintenance (CR 42)</p>				

TABLE D-3

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III EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE							
ELEMENT	MONITORING LOCATIONS	INDICATORS	STANDARDS	VISUAL MONITORING	PHOTO-MONITORING	ACTIONS (based on present condition)	OBSERVER RECOMMENDATIONS
Opportunity Classification III Developed facilities Developed recreational facilities; facilities available for user convenience; frequency of contact is moderate to high in developed sites & on roads & trails; onsite controls obvious & numerous. Compare with baseline photos & data (observations)	Trail at La Ventana Natural Arch	Trail width	Width ≤ 12 inches over design trend	Establish baseline inventory data collection	Establish baseline inventory photos	Use "Leave No Trace" ethics & interpretive programs	Date:
	Narrows Picnic Area	Trail erosion	2 locations of erosion or gullyng ≤ 1 ft./¼ mi.	Visual observation of 10% for each facility, 3 times/year	Establish 1 photo point/site where standard was exceeded	Increase BLM patrols	Time:
		Unauthorized trails	2 distinct trails from designated trail	3 times during high-use period, May-September or hunting season	Photo-monitor sites 1 time/year	Establish "Public Land Watch" Program	Observer:
		Number of incidents of vandalism	≤ 5 incidents of vandalism/facility			Increase signing	
		Vegetation trampled or disturbed that does not recover annually	≤ 25% vegetation trampled or disturbed when compared with adjacent undisturbed area			Rehabilitate area or restrict areas for rehabilitation	
					Law enforcement actions		
					Issue permits for visitor use or reservations for Ranger Station programs		
					Keep records/data of vandalism		

TABLE D-4

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IV EL MALPAIS NATIONAL CONSERVATION AREA--LIMITS OF ACCEPTABLE CHANGE							
ELEMENT	MONITORING LOCATIONS	INDICATORS	STANDARDS	VISUAL MONITORING	PHOTO-MONITORING	ACTIONS (based on present condition)	OBSERVER RECOMMENDATIONS
Opportunity Classification IV National Conservation Area Facilities for user safety & resource protection; limited evidence of previous recreation use; low to moderate frequency of contact; primitive roads & motorized use are present. Compare with baseline photos & data (observations)	Sand Canyon Road	Number of pieces of trash	≤25 pieces of trash/location	Establish baseline data collection Visual observation of each site, minimum 1time/year Once during high-use period, May-September or hunting season	Establish baseline inventory photos Establish 1 photo point/site where standard was exceeded Photo-monitor sites 1 time/year	Use "Leave No Trace" ethics & interpretive programs Increase BLM patrols Law enforcement action Restrict areas for rehabilitation or repair Operation Respect during hunting season	Date:
	Chain of Craters WSA (Cerro Piedrita, Cerro Lobo, Cerro Chato)	Number/distribution of campsites	≤3 campsites visible within 300 ft. of each campsite				Time:
	Cerro Rendija	Number of unauthorized roads	≤2 distinct unauthorized roads from designated road in BLM road inventory				Observer:
		Vegetative loss	Base mineral soil ≤400 sq. ft. at established campsites				