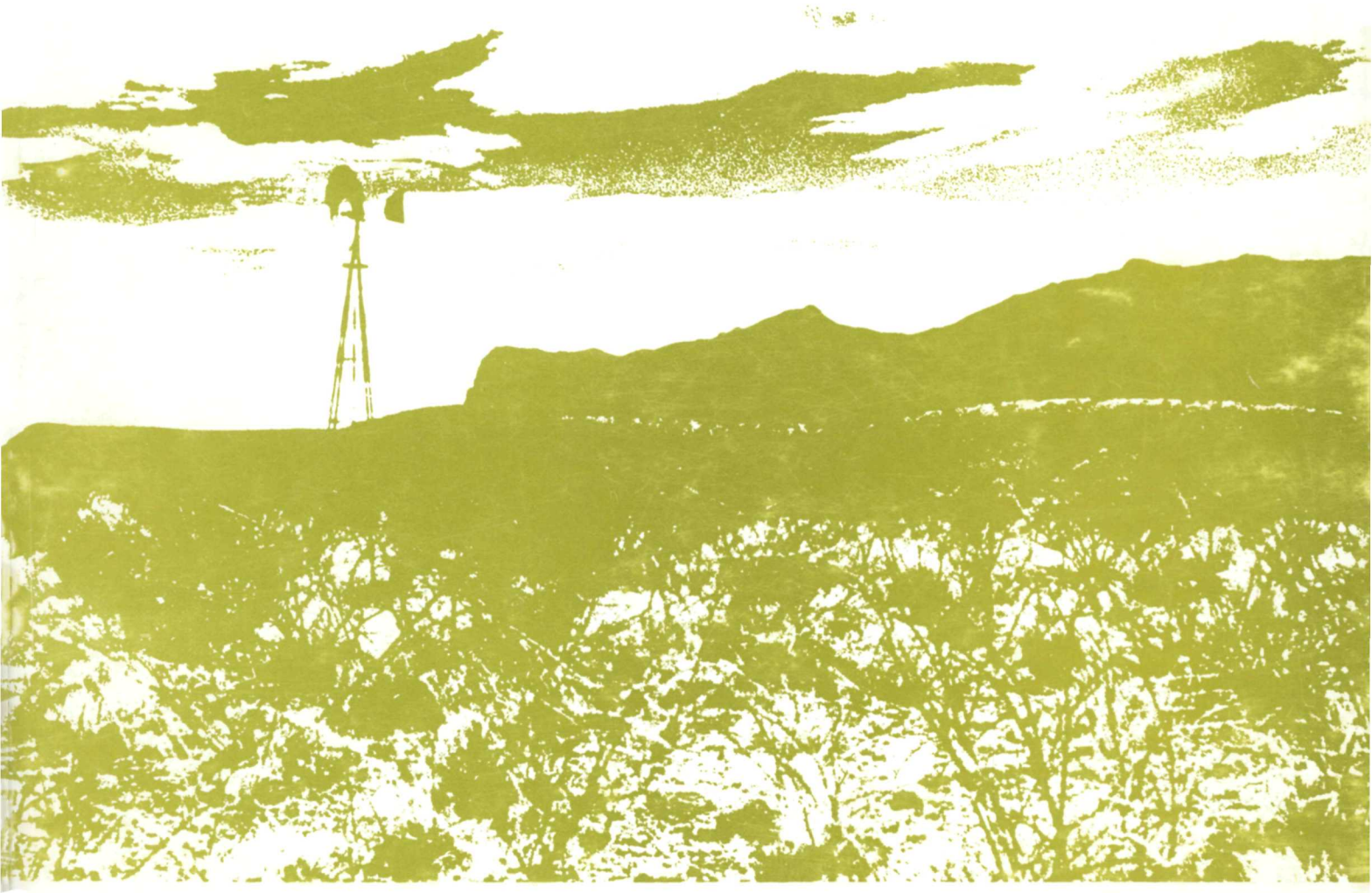
A Basis for Facility Development at Guadalupe Mountains National Park



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A BASIS FOR FACILITY DEVELOPMENT AT GUADALUPE MOUNTAINS NATIONAL PARK

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CHAPTER I

INTRODUCTION

With the signature of President Lyndon B. Johnson on October 15, 1966, Public Law 89-667 authorized the establishment of Guadalupe Mountains National Park. Thereby, one of the most outstandingly beautiful spots in the state of Texas was set aside for the enjoyment and benefit of all Americans.

The Guadalupe Mountains tell a story of some 12,000 years of man's existence--of cave dweller, conquistador, and marauding Apache, of gold hunter, stage driver, and cavalryman.

As well as having a colorful history, the Guadalupe Range possesses an abundance of natural and scenic values. Geologists, botanists, and zoologists are intrigued by the unique combination of natural phenomena that may be found within the boundaries of this newly authorized national park. A dramatic chapter of geological history has been exposed there. El Capitan, Guadalupe Peak, and McKittrick Canyon are the names of the three most famous features that have been sculptured from this immense, uplifted "fossil reef." Vegetation ranging from desert xerophytes to alpine evergreens provides a relict display of botanical specimens. Similar diversity is apparent in wildlife representation since mountain lion, elk, brown bear, Merriam turkey, mule deer, fox, mountain

sheep, and over 200 species of birds may be found in the Guadalupes. And McKittrick Canyon also contains Texas' only trout stream.

Relationships between this future recreation facility and other nearby recreation facilities of southeastern New Mexico exist in a real and mutually beneficial form. Guadalupe Mountains National Park must be considered an integral part of an evolving recreational complex; a segment that rounds out and completes a previously established recreational package. Carlsbad Caverns National Park and the southernmost section of Lincoln National Forest are the other two components of this complex.

Before the public can take advantage of the fine recreational opportunities afforded by this prospective addition to our national park system, a certain sequence of events must unfold. First, funds must be appropriated for the purchase of all land authorized for the park and the titles acquired by the federal government. Next, a formal "notice of the establishment of the Guadalupe Mountains National Park shall be published in the Federal Register."[1] And, of course, development cannot begin until the park is legally created.

Unfortunately, progress has been slowed and the issue remains stalled in the land acquisition stage. Funds for park land acquisition have been reduced to a trickle at this point in history, and not without reason. The Vietnamese war has preempted a swelling amount of resources that normally would be channeled into public works and

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[1]U.S., Congress, House, An Act to Provide for the Establishment of the Guadalupe Mountains National Park in the State of Texas, and for Other Purposes, P.L. 89-667, 89th Cong., 2d sess., 1966, H.R. 698, p. 1. (Hereinafter referred to as P.L. 89-667.)

other programs. In 1967 President Johnson hoped to purchase all the land for Guadalupe Mountains National Park and requested $1,800,000; an austerity-conscious Congress allowed only a token $354,000.[2] In 1968 the President asked for the remainder needed to complete the purchase. This time, as before, Congress deleted all but a $200,000 down payment.[3]

Even though ownership of Guadalupe Mountains National Park has not been secured, sufficient guidance has been outlined so that comprehensive planning need not be postponed. The exact size and location of the park are known. Monetary limits have been established, with P.L. 89-667 setting a $10,362,000 cost ceiling for development.

The Department of the Interior and the National Park Service have made several feasibility studies of the Guadalupe Mountains. Consequently, most of the geological, archeological, historical, zoological, and botanical resources of this area have been evaluated. These studies were undertaken to determine those features that made this section of Texas sufficiently unique as to warrant national park status. Afterwards, master plans were proposed. None, however, has been adopted.

The master plan that is eventually adopted must reflect, as nearly as is possible, the wants and needs of the park's prospective users. Design loads, carrying capacity, and effective resource

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[2]"Action Needed on Guadalupe Park Land This Year Or Price Will Go Higher," Lubbock Avalanche-Journal, April 24, 1968, p. 16-A.

[3]"$200,000 Fund OK'd For Guadalupe Park," Houston Chronicle, July 13, 1968, p. B-12.

utilization must be based on knowledge of potential visitors, whether calculated or assumed. Accuracy in prediction of needs can increase reliability in planning and efficiency in operation. Thus, there is a need to resolve opinion through scientific inquiry. Now is the time to gather information and to collect data. In this manner a contribution can be made to that reservoir of knowledge from which development decisions are made.

In this particular circumstance where a variety of demands has been advanced, choices among possible alternatives must be made. Decision-makers who establish the policies and guidelines of development must be vitally concerned with the soundness and effectiveness of the programs they propose. All existing available information should be screened, scrutinized, and considered. Information pertinent to the park's natural features has already been researched. However, at the present time there is a lack of data on interests and characteristics of recreationists who will be using the park. Many estimates have been proposed, sometimes with wide divergence. One example of this is the somewhat vague and contrasting estimates of annual visitation. A Master Plan Brief dated October, 1965, contained the following statement:

> Projected travel is expected to be somewhat lower than that at Carlsbad Caverns--thus estimated at about 300,000 per annum.[4]

Then, when Mr. George B. Hartzog, Director of the National Park Service, appeared before a House Appropriations subcommittee early

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[4]Letter from Neal G. Guse, Superintendent, Carlsbad Caverns National Park, to John M. Gosdin, January 10, 1968.

in 1968, he stated that 525,000 annual visitors were expected by 1970 at Guadalupe Mountains National Park if all the land is acquired by that time.[5] Opinions may or may not be valid, but investigation and analysis can help to substantiate or to refute earlier derived estimates of the situation. At this juncture, when the normal flow of events has been slowed to a snail's pace, time can be used to advantage if planning is continued in a detailed and objective manner.

Final decisions on policy and development must be sensitive to the resources at hand, as well as to the visitor who will use the facility. In the hope of contributing to the latter, the purpose of this thesis is to determine some general characteristics of tourists in this area of West Texas and southeastern New Mexico and to develop information that may be helpful in planning facilities for the future Guadalupe Mountains National Park.

Included within the scope of this thesis are: (1) a review of the park's potentials and limitations; (2) a look at the park's evolution toward reality; (3) an investigation of the characteristics and habits of travelers in the immediate vicinity through the use of a visitor survey; (4) a report of survey results; and (5) conclusions and an application of new information to the situation at hand.

The assumptions on which this research is based are as follow:

1. that the southernmost section of Lincoln National Forest, Carlsbad Caverns National Park, and Guadalupe Mountains National Park will form a recreation complex (see Fig. 1);

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[5]"Action Needed on Guadalupe Park Land This Year Or Price Will Go Higher," Lubbock Avalanche-Journal, April 24, 1968, p. 16-A.

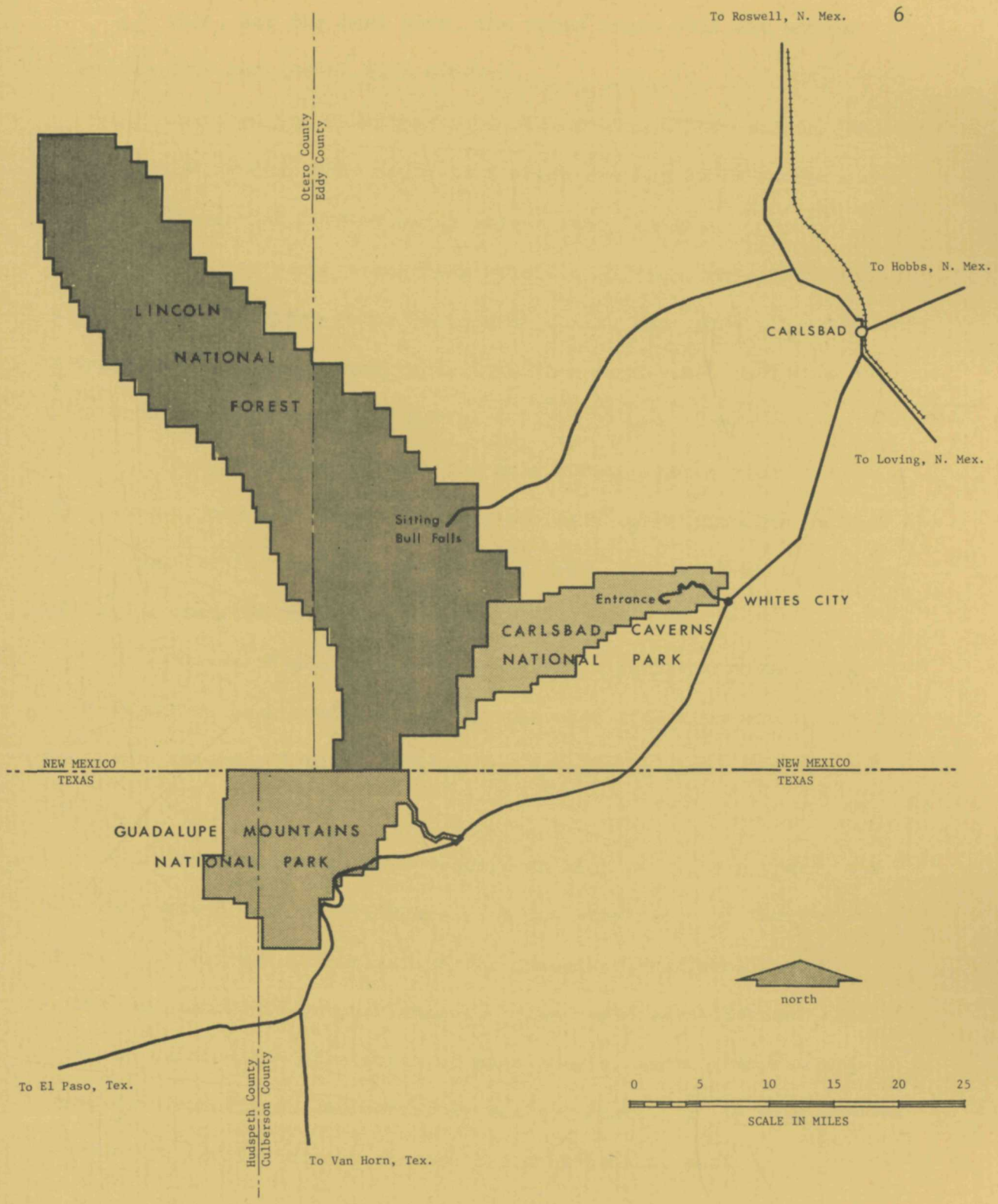

Figure 1. Three Components of a Recreation Complex

2. that, for the most part, the three areas will and should complement or supplement each other;

3. that, in its development, Guadalupe Mountains National Park will provide recreational activities which are not found in the other two facilities--and thereby being unique unto itself;

4. that, to perpetuate these unique qualities, major emphasis in planning will be given to protection of easily destroyed values through a determination of carrying capacities to assure preservation of the site according to prescribed National Park Service standards;

5. that, in order to make the most comprehensive plans for park development, characteristics and desires of present visitors to this area, specifically Carlsbad Caverns visitors, are the best indicators of future users of Guadalupe Mountains National Park.

It is hoped that a determination of such information would be beneficial to those who must propose the most effective allocation of funds and the most logical program for developing facilities in the park.

While most national parks require as much as fifteen years, the unusually brief span of six years from the submission of initial legislation until formal authorization for Guadalupe Mountains National Park is a remarkable accomplishment. This rapid establishment resulted from the culmination of efforts of many people, among them Frank X. Tolbert, Glenn Biggs, and certainly Wallace Pratt. It is with similar concern and farsightedness that future achievements must be measured.

CHAPTER II

LITERATURE REVIEW

A New National Purpose

Traditionally, any natural landscape set aside for preservation and enjoyment has been referred to simply as a park. In more recent times, however, social exigencies have created the need for more specific terminology and more precise criteria.

Around the turn of this century the American experience broadened its base and incorporated a new structure of ideas. Attitudes of Americans underwent a marked change. The march of our national events brought economic well-being and a certain measure of affluence to almost all Americans. At the same time that education widened the span of an individual's interests, a sophisticated technology and increasing affluence provided both the time and the means for his indulgence in them. Under these new circumstances the pastimes and leisures previously reserved for the relatively few elite became popular, indeed vital, activities. Thus the stage was set for a new chapter in American history and a new awareness of America's natural endowment.

Our public park policy was first enunciated by legislation establishing Yellowstone National Park in the Act of March 1, 1872, in which Congress proclaimed that selected sections of public

domain were to be

> . . . reserved and withdrawn from settlement, occupancy or sale under the laws of the United States and dedicated and set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people. . . . That . . . the Secretary of the Interior . . . shall provide for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities or wonders within said park, and their retention in their natural condition.[6]

This act was the harbinger of a nascent concept which expanded the function of national responsibility to meet a new public purpose.

Later, additional needs brought new legislation which was required to match the tempo of changing times. The Antiquities Act of 1906 gave the President authority to set aside National Monuments. In 1916, the National Park Service was established, an action creating the administrative machinery for overseeing an expanding system of national "pleasuring-grounds." Then, our nation's parks and public lands were industriously improved by the social work programs of the New Deal. Most recently, National Historic Sites, National Parkways, National Seashores, and National Recreational Areas were provided for, as each one marked a new concept in the responsibilities of our national park system.

As the mandate of responsibility for America's natural environment and public recreation burgeoned, a re-assessment of the management, planning, and coordinating functions of the now complex system was required. Therefore, President Eisenhower commissioned a blue-ribbon panel for that purpose; and in 1962, the Outdoor Recreation

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[6]U.S., Department of Interior, NPS Briefing Book (Washington, D.C.: Government Printing Office, 1966), p. 28.

Resources Review Commission submitted their findings. Out of their recommendations, new objectives were shaped and new criteria promulgated for the national park system.

Three categories of areas--natural, historical, and recreational--were prescribed. Since the new national park which is the subject of this thesis is relegated to the first of these categories, a survey of the criteria for natural areas is essential as a background for discussion of the merits of Guadalupe Mountains National Park.

Criteria for Natural Areas

National Significance

The first criterion on which a National Park (or a National Monument) must be judged is that of national significance. National significance is attributed to those areas exhibiting qualities of exceptional value which add some new dimension in interpreting our nation's natural heritage. Some specific examples have been set forth:

1. Outstanding geological formations or features significantly illustrating geologic processes.
2. Significant fossil evidence of the development of life on earth.
3. An ecological community significantly illustrating characteristics of a physiographic province or a biome.
4. A biota of relative stability maintaining itself under prevailing natural conditions, such as a climatic climax community.
5. An ecological community significantly illustrating the process of succession and restoration to natural condition following disruptive change.

6. A habitat supporting a vanishing, rare, or restricted species.

7. A relict flora or fauna persisting from an earlier period.

8. A seasonal haven for concentrations of native animals, or a vantage point for observing concentrated populations, such as a constricted migration route.

9. A site containing significant evidence illustrating important scientific discoveries.

10. Examples of the scenic grandeur of our natural heritage.[7]

Any one of the foregoing is sufficient justification for the establishment of a National Park or a National Monument if its value is paramount. Not only does Guadalupe Mountains National Park possess a majority of the above examples, but also it has been conserved in near pristine state for almost fifty years.

Suitability

The second criterion is the standard which measures appropriateness and propriety. To be classified as a National Park, a site should consist of a spacious area possessing beauty and quality together in such a superlative combination that the site should be forever preserved for only the highest forms of outdoor recreation. The park lands should comprise a comprehensive unit for effective public usage, as well as for proper management and perpetuation of native flora and fauna. A broad range of recreational activities should be available within a natural setting; however, those features

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[7] U.S., Department of Interior, NPS Criteria for Parklands (Washington, D.C.: Government Printing Office, 1966), p. 10.

or characteristics which merited the park's establishment must be preserved. Usually a National Park would contain numerous intangible assets having both scenic and scientific value.

Feasibility

Lastly, the yardstick of practicality must be used to evaluate feasibility. If the creation of a specific National Park fulfills either present or future public needs and if its creation outweighs alternative uses, then the proposal is justified, and the park should become a reality.

Guadalupe Mountains National Park--Reasons for Establishment

The Guadalupe Mountains area was the subject of several feasibility studies cooperatively sponsored by the U.S. Department of Interior. Advisory boards, Senate committees, and inspection teams visited there; all reached the same conclusion--that the area met all the above mentioned criteria for a natural area.

Later, when P.L. 89-667 officially established Guadalupe Mountains National Park the reason for its creation was explicitly stated in legislative rhetoric: " . . . to preserve in public ownership an area in the State of Texas possessing outstanding geological values with scenic and other natural values of great significance."[8] Thus, the land within this new addition holds intrigue for scientists and recreationists alike (see Fig. 2).

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[8] P.L. 89-667, sec. 1.

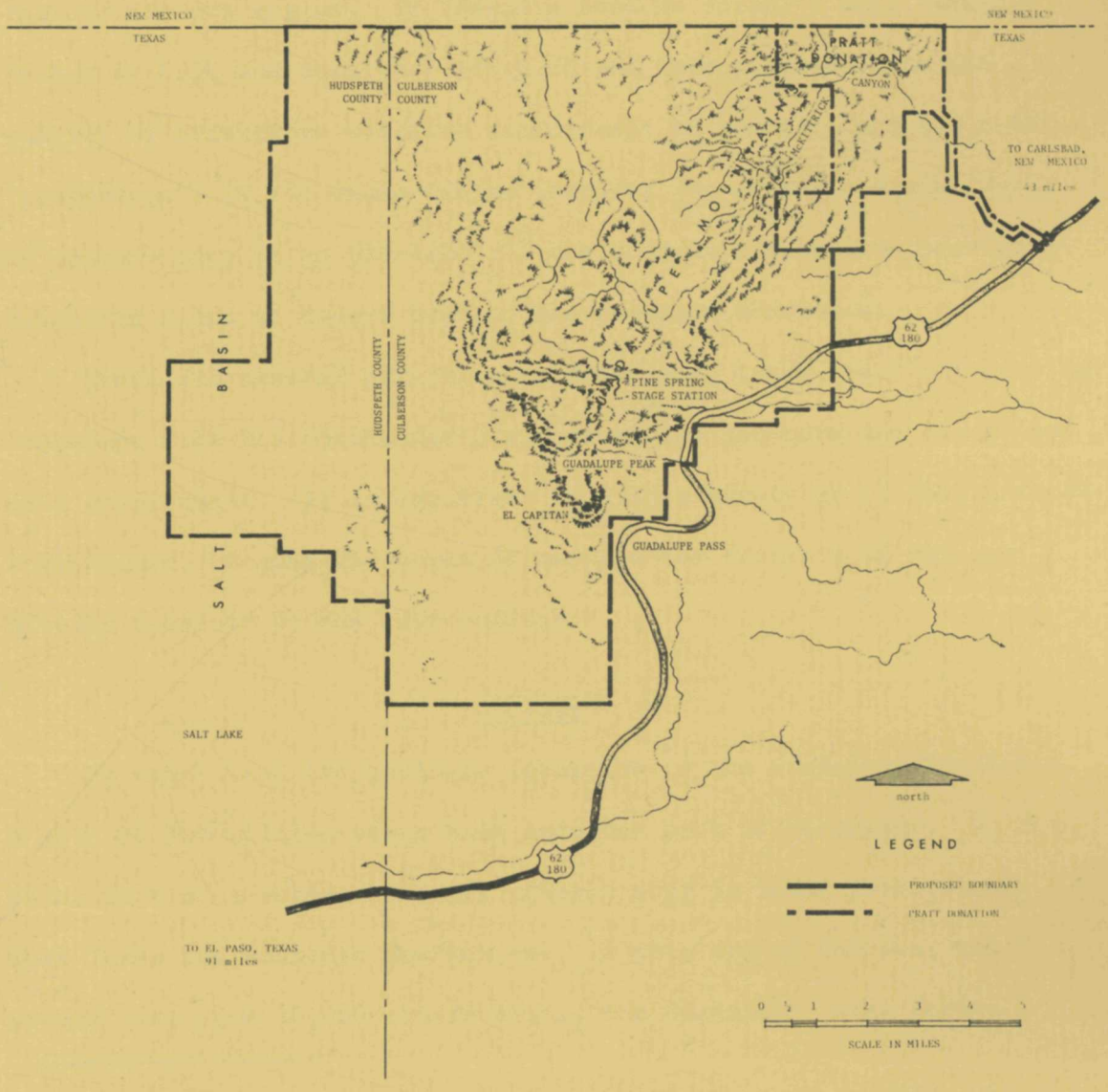

Figure 2. Map of Proposed Guadalupe Mountains National Park

Park Environment

Parcels of geography set aside as national parks represent so many points of the compass, so many natural environments, that each imparts to the visitor its own singular flavor, with the beauty and feel of its own region. If Yosemite bestows serenity amid "massive exuberant bulk and beauty";[9] if the Grand Tetons communicate the quality of boisterous vitality reminiscent of mountain men and their "rendezvous"; if the Grand Canyon inspires awe amidst a vivid "world of canyons deep in an old land";[10] the Guadalupe Mountains provide a delicious blend of desert dryness and mountain headiness.

There are several natural phenomena that, taken together, provide Guadalupe with its particular brand of native splendor and its unique park environment. It is important to gain a knowledge of this natural environment, because the works of man and the thoughts of man are usually inspired by his surroundings.

Geology

To understand the geologic formation of the Guadalupe Mountains, a trip of 200 million years back into the past is necessary. At that point in time a Permian estuary covered what is today portions of West Texas and southern New Mexico. In this arm of the sea, which spread over some 10,000 square miles, the Guadalupes were formed.

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[9]John Muir, My First Summer in the Sierra in Gentle Wilderness, ed. by David Brower (San Francisco: H.S. Crocker Company, Inc., 1964), p. 74.

[10]Eliot Porter, ed., The Place No One Knew (New York: Ballantine Books, 1966), p. 16.

This ancient sea was an ideal habitat for lime-excreting algae. Colonies of these organisms established themselves a short distance offshore where a clean and shallow sea floor, clear water, and strong sunlight made it possible for them to thrive. For thousands of years, and for generation after generation, these tiny bits of protoplasm added layers of limestone to the ocean floor. The accumulation process continued until a hundred-foot thick barrier reef was formed. At this time a simultaneous phenomenon occurred, which allowed the developing formation to assume giant proportions: the sea floor began to subside. It sank at approximately the same rate that the reef grew upward. The result of this unusual combination of circumstances was the formation of a layer of limestone some 2,000 feet thick and several hundred miles long. The resulting Capitan Barrier Reef is the most extensive fossil organic reef known anywhere in the world.

For most of its length the reef remains locked in subterranean fastness. There is but one exception. Slow vertical movements and cataclysmic shifts in the earth's crust lifted one section of the reef above the surface of the land that surrounds it. Today this exhumed sea floor is known as the Guadalupe Mountains. From an abrupt southern termination point at El Capitan, the Guadalupe Mountains extend northward for nearly fifty miles. The elevation ranges from a maximum height of 8,751 feet at Guadalupe Peak to approximately 4,400 feet at the entrance of Carlsbad Caverns.

Since McKittrick Canyon slices squarely across the axis of the

Guadalupe Mountains, it furnishes a full-scale cross section of the Capitan Barrier Reef. For that reason this canyon is a place of consuming interest to earth scientists. During the fifteen-year period he lived in the canyon, Mr. Wallace Pratt recounted:

> Literally thousands of geologists came to McKittrick Canyon to study the amazing section of marine rocks displayed in its 2,000-foot-high walls. These geologists came from industrial corporations, from colleges and scientific institutions all over this country--professional geologists, students and teachers, alike. Not uncommonly they arrived in groups of 100, or more, each. And geologists came also from foreign lands; as long ago as 1933 . . . a party of 18 geologists [was comprised of] British, French, Russian, Japanese, Scandinavian, Indian, and Mexican, with only 2 Americans.[11]

Why is this formation such a mecca for both amateur and professional geologists? Not only is it a geological oddity, but also it is in the porosity of such fossil reefs that much of the world's store of petroleum is housed. The fantastically rich Permian oil and gas fields located near Odessa and Midland, Texas, resulted from the decomposition of marine life that lived in this same ancient sea. An equally remarkable geological attraction are the great chambers of Carlsbad Caverns which were carved out of the very core of the Capitan Reef.

The presence of these and other mineral resources on properties near Guadalupe led to speculation and an investigation of potential mineral resources within the proposed park boundaries. On July 27, 1965, Secretary Udall appointed a team of geologists to determine

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[11]U.S. Congress, Senate, Committee on Interior and Insular Affairs, Guadalupe National Park, Hearings, before the subcommittee on Parks and Recreation, on S. 295 and H.R. 698, 89th Cong., 1st and 2nd sess., 1965 and 1966, p. 21. (Hereinafter referred to as Hearings.)

through expert judgment the mineral potential within the area. In their report to Secretary Udall, the team reached the following conclusions:

> The geologic resources of the proposed Guadalupe Mountains National Park--in the form of unparalleled exposures of the great Capitan Reef and its fore-reef and back-reef facies--are of enormous scientific value.
>
> Apart from ground water and construction materials, however, the proposed park does not appear to contain presently or prospectively valuable minerals in commercial quantities. Oil, gas, and saline minerals--the valuable minerals of the surrounding region--are not presently known within the area.[12]

Hence, no potential mineral extraction would be foregone when this area was set aside as a "pleasuring ground." Recreation and interpretation became the unchallenged highest and best land use.

Vegetation

Rising sharply from arid flatlands to alpine crests of more than 8,500 feet, Guadalupe Mountains National Park sustains an unusual combination of plant life. From its origin in the Mexican state of the same name, the vast Chihuahuan Desert sweeps northward until it separates to either side of the Guadalupes. Some 19,000,000 acres of Trans-Pecos Texas is classified as Chihuahuan Desert. Of course, a scarcity of rainfall predominates, with the average annual precipitation usually being less than ten inches.[13] Meanwhile, several thousand feet above the flatlands' surface, and only a few miles away, mountain peaks languish in relative coolness. Temperatures are much lower there and

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[12] Hearings, p. 94.

[13] Chester M. Rowell, The Chihuahuan Desert in Texas (Lubbock, Texas: Craftsman Printers, Inc., n.d.), pp. 1-2.

moisture levels much higher. Here in close proximity may be found two geophysical extremes and a wide range of environments and biomes as well.

Besides geology, botany is the natural science which has been most studied in West Texas. Plant identification and distribution studies have been conducted since 1905, when a Department of Agriculture biological survey was completed. Noteworthy among more recent investigators, because of his particular interest in the Guadalupe Mountains, is Frederick R. Gehlbach, currently an assistant professor of biology at Baylor University. Mr. Gehlbach has studied this area for several years both on his own and in conjunction with the Carlsbad Caverns staff. His articles and reports constitute a significant backlog of information on the vegetation of the Guadalupes.

The United States has been divided into seven "life zones": Canadian, Hudsonian, Artic-alpine, Transition, Upper Sonoran, and Lower Sonoran.[14] Ranging from the true tropics to artic zones, for the most part vegetation in these life zones follows a fairly predictable pattern of distribution as they are responsive to latitude and altitudinal differences. Life zones, then, are well-defined areas of biological distribution based on careful delineation of native species of plants and animals. Certain species serve as indicators for each zone.

In macroecological application this concept of life zones has

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[14]Paul F. Spangle, "The Chihuahuan Desert: Its Trees and Flowers," in Guide Book to Carlsbad Caverns National Park, ed. by Paul F. Spangle (Washington: The National Speleological Society, 1960), p. 24.

validity, but when studying biotic communities on a smaller scale it is not so workable. Some locations in the Guadalupes and adjacent flats exhibit the prescribed indicator plant species in compatible existence. Meanwhile, the canyons which are cut into the escarpment disrupt many plant communities and cause an intermixture of plant species. Such an undifferentiated assortment of plants is called a "continuum" by ecologists. McKittrick Canyon is an excellent example of this phenomenon. A partial list of specimens found there would include the following: alligator juniper, agave, sotol, Texas walnut, madrone, bigtooth maple, ponderosa pine, creosote bush, and cholla.[15] Another example incompatible with the life zone concept may be observed in the highlands near the Bowl. There, on the exposed slopes above the Bowl narrowleaf sotol and other desert plants may be found growing together with a limber pine-Douglas fir forest.[16] It is this unlikely overlap of plant associations which makes the Guadalupe Mountains botanically unique and lends a distinctive character to the park.

Early adventurers passing through the area viewed the plant life with an eye more for practicality than for esthetics. Commander of an exploratory cavalry expedition, Captain Randolph B. Marcy made the following observation:

> The mountains are covered on the western side with groves of large pine trees; and as this is the only kind of timber

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[15] Frederick R. Gehlbach, "A Biological Visit to McKittrick Canyon," National Parks Magazine, Vol. 37, no. 186 (March, 1963), pp. 4-7.

[16] Frederick R. Gehlbach, "Plant Formations in the Natural History Interpretation of Southwestern Desert Regions," National Parks Magazine, Vol. 40, no. 220 (January, 1966), pp. 16-18.

> fit for building in the country, it may some day be useful. We have also seen a species of cedar with the bark resembling that of an oak, and very different from any we have ever seen before.
>
> There are many varieties of the cactus and palmettos about the mountains, and we have this evening for the first time seen the maguey [agave] plant which constitutes almost the only vegetable food that the Apaches and southern Comanches get for a great portion of the year. They prepare it by boiling it until it is soft, then mash it into a paste, and I am told that in this form it makes a very palatable, nutritious food.[17]

Other plants besides pine trees and agave were valuable to man. Of course, grasses provided forage for livestock. Sotol, with its starchy heart, has been useful in tiding stock over periods of scarcity when pastures were bare. Junipers and oaks provided fence posts, fuel, and building materials for the ranch as well as shade, shelter, and food. Seeds of various legumes, acorns of several oaks, and berries of junipers furnished feed for poultry and wildlife.[18]

Two rare plant species furnish the park with some of its choicest treasures. The huge faxon yucca is found in no other unit of the national park system. Reaching a height of some eighteen feet in the Guadalupes (forty-feet tall specimens have been reported further to the south), the faxon yucca is crowned with a majestic white flower stalk during April.[19] A second remarkable plant is the Texas madrone or manzanita. This shrub is frequently seen in the canyons and draws

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[17]Grant Foreman, Marcy & the Gold Seekers (Norman, Oklahoma: University of Oklahoma Press, 1939), pp. 349-350.

[18]Vernon Bailey, North American Fauna, Biological Survey of Texas (Washington, D.C.: Government Printing Office, 1905), pp. 30-31.

[19]Gehlbach, "A Biological Visit to McKittrick Canyon," pp. 4-7.

of the park and exhibits a most unusual feature: " . . . when the old bark is off, the stock and branches have more the appearance of the limbs of a person, both in color and texture, than of a tree, the exterior being a most beautiful flesh-color."[20] Another colorful common name was supplied by Mr. Conrad L. Wirth, former Director of the National Park Service, when he referred to madrone as "school-marm's leg."[21]

Wildlife

Since a great diversity of vegetation is represented in the Guadalupes, it follows that a similar variety of wildlife might also be encountered there. And that is precisely the case.

In days past the mountains and canyons were the habitat of even more species than today. The Merriam elk once roamed the high country, but this species is now extinct. In the 1920's, however, American elk were introduced. The small herd prospered and increased to its present size of near 100 animals. The Mexican bighorn or mountain sheep used to range along the steep and rugged canyonsides. As the terrain was inaccessible to most hunters, the bighorn held its own for many years. Finally around 1935, they disappeared altogether.[22] Their numbers had been gradually decimated, and some old-time ranchers speculated that the bighorns had no immunity to common diseases

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[20] Foreman, p. 353.

[21] Conrad L. Wirth, former Director of National Park Service, private interview during unofficial visit to McKittrick Canyon, May, 1968.

[22] William O. Douglas, Farewell to Texas (New York: McGraw-Hill Book Company, 1967), p. 182.

brought into their mountain retreats by domestic sheep.[23] Merriam turkeys were native to this area before the Anglos came, but disappeared soon afterward. In 1901, Vernon Bailey, chief field naturalist for the Department of Agriculture, reported the presence of brown bear on the upper slopes and in the most inaccessible canyons.[24] In 1954, the same species was reintroduced and have since thrived.

Although today's listing of mammals is not quite as large as in previous years, it is still expansive. Presently the Guadalupes are home for mule deer, ringtail cat, bobcat, coyote, gray fox, kit fox, rock squirrel, porcupine, raccoon, jackrabbit, and cottontail rabbit. Mountain lion and black bear may still live there even though sightings are made only on rare occasions.[25]

Birds, too, both in numbers and in species are abundant. McKittrick Canyon was chosen as the location for the Texas Ornithological Society's spring field trip in 1968. While it was there, this group spotted birds ranging from golden eagles to hummingbirds. Also, white-throated swifts, marsh wrens, western tanagers, grey vireos, swallows, juncos, stellar jays, and pigmy nuthatches added color both in plumage and in song to the canyon.[26]

Fishing is often important as a sport, but in the Guadalupes, and specifically McKittrick Canyon, the presence of fish are a biological novelty. In 1947, approximately 4,000 rainbow trout were

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[23] Ibid., p. 183.

[24] Bailey, pp. 187-188.

[25] Douglas, p. 182.

[26] Geth Osborn, "The Lady Outdoors," Outdoor Times, May 24, 1968, p. 6.

released in McKittrick Canyon's clear, cold stream. Trout up to fourteen inches long have been reported since that time.[27] However, on trips the author has made to the canyon, six-inch trout were the largest ones seen. Perhaps this explains in part the good-natured jesting that Texas' only trout stream has received. In the hearings before the Senate Subcommittee on Parks and Recreation, Attorney General Boston Witt of New Mexico, one of Guadalupe's staunchest supporters, remarked amusedly:

> I have over the years watched many thousands of Texans come to New Mexico to discover the delights of trout fishing. It therefore seems altogether fitting and proper that the only trout stream in Texas be preserved for posterity.[28]

Completing the wildlife picture are the amphibians and reptiles. In 1964, the interpretive staff at Carlsbad Caverns in cooperation with Baylor University compiled a listing of the known amphibian and reptilian species found in the Guadalupe Mountains. This checklist identified over seventy different species.[29]

In conclusion, this portion of West Texas provides the state with one of its most unusual wildlife populations and with a variety of associated recreation potentials.

History

Now that those natural components of the physical setting have

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[27] Dick Mahan, "Big, Beautiful, Bold," This Is West Texas, April-May, 1967, p. 7.

[28] Hearings, p. 26.

[29] Frederick R. Gehlbach, Amphibians and Reptiles of Carlsbad Caverns National Park, New Mexico, and Adjacent Guadalupe Mountains (Carlsbad, N.Mex.: National Park Service, 1964), p. 1-10.

been examined, it is time to bring man on the scene and develop the human drama. So, enter man.

Until this time the laws of nature had held unquestioned sway. But with utter impetuousity, this mortal intruder came to challenge the elements; meekly at first being content to live from hand to mouth, more boldly later as he sought to mulct the land of its rumored riches, and confidently at last wresting a comfortable existence from the begrudging terrain. Thus, the Guadalupe Mountains have been in a vortex of history for centuries as events ranging in time from ancient to modern swirled around the park site. And yet, the backdrop for these episodes, the land itself, has been left comparatively unaltered.

The story of the Guadalupes is mostly untold; its chroniclers are few. Nonetheless, from a few simple narratives, excerpted newspaper articles, and official journals and records, much of the story can be pieced together. What emerges is a fine drama having those ingredients of ecstasy and pathos, of esperance and tragedy, which make for classical intrigue. Included in dramatis personae are primitive pagans, barbaric nomads, Old World noblemen, dreamers, adventurers, fortune seekers, libertarians, and benefactors.

It is now time to fill in the names, dates, and occurrences which have a part in Guadalupe's historical account. The imprint of man falls easily into three periods: ancient, recent, and contemporary. The first section will tell of that period prior to recorded history and of the Guadalupes' first inhabitants. The second section will deal with that period we know about through written accounts. It will recount the events of discovery, exploration, and settlement. And the

third will be addressed to that period beginning roughly with 1900--a chapter which remains vivid in the memories of today's old-timers. This last section will summarize the melange of circumstances and decisions which culminated in the establishment of Guadalupe Mountains National Park.

Ancient History--The First Inhabitants

At best, our presently accumulated knowledge of ancient man in the Guadalupes is imprecise. However, a general background has been fairly easy to reconstruct: early man lived off the land by hunting and gathering wild plants; his numbers were relatively small; his habitations were most often naturally occurring caves and solution chambers; and finally he was either displaced or absorbed by more aggressive neighbors. At his departure he left crude but colorful hieroglyphs, broken weapons and tools, and shattered pottery with a slumbering nuclear glow to speak of his presence.

Archeological investigations have been ongoing since 1925, when J. Walter Fewkes representing the Bureau of American Ethnology first began collecting information on the original inhabitants in this part of the Southwest.[30]

As a result of his and other early studies, it has been substantiated that men have resided in the Guadalupes for at least 6,000 years. Until recently, this had been largely supported through an association discovered by E. B. Howard in 1932, when he found the

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[30]U.S., Department of Interior, Area Investigation Report on a Proposed Guadalupe Mountains National Park, Texas, (Santa Fe, N.Mex.: Southwest Regional Office, National Park Service, 1963), p. 29. (Hereinafter referred to as Investigation Report.)

remains of early man together with skeletons of extinct animals such as the Taylor bison, four-horned antelope, musk ox, and primitive horse.[31] Since these creatures roamed the earth some 6,000 years ago, man must have been there for at least that span of time.

Hermit's Cave, situated in the middle course of Last Chance Canyon, has been the location of much excavation and study. Chief investigator at this site has been Edwin Ferdon. Mr. Ferdon began his work in the mid-1940's when he preempted the reclusive James Picket (hence the origin of the cave's name) long enough to uncover some enlightening artifacts. At least three, and possibly four, occupational levels were revealed in his excavations. Carbon 14 testing of three samples of matter taken from the lowermost layer indicated ages ranging from 11,850 to 12,900 years.[32] This earliest group of residents was the one associated with the above mentioned extinct animals, and they can be called truly "the ancients." The second group of cave dwellers were basket weavers as they fashioned several products from the fiber of yucca, lechuguilla, and sacahuiste. Wickerwork sandals, coiled baskets, and patches of matting were disclosed in the debris of the second occupational level.[33] This would assign these inhabitants to the West Texas-Hueco Basketmakers, an unkenned clan of the Archaic Desert Culture who prospered from 2,000 to 4,000 years ago.[34] The

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[31]Paul F. Spangle, "The First Human Inhabitants of the Region," in Guide Book to Carlsbad Caverns National Park, ed. by Paul F. Spangle (Washington, D.C.: The National Speleological Society, 1960), p. 19.

[32]Ibid., p. 19.

[33]Edwin N. Ferdon, Jr., An Excavation of Hermit's Cave, New Mexico (Santa Fe, N.Mex.: The University of New Mexico Press, 1946), p. 25.

[34]Spangle, "The First Human Inhabitants of the Region," p. 19.

topmost layer of debris (save for the leavings of Hermit Picket) contained numerous potsherds. Indians of this period used pottery vessels for storage purposes. Although no complete vessel was unearthed, some twenty-eight pottery fragments were collected by Ferdon. These clay potsherds belong to the "Classic, or Pueblo III, Period with a time range from about 1250 to 1300 A.D."[35]

For whatever reason the periods of habitation were interrupted, it cannot be denied that Hermit's Cave furnished an acceptable measure of comfort to its former occupants. The "cave" or solution chamber is a natural shelter facing east at the top of a talus slope of some sixty-five feet height. It is thoroughly dry and unaffected by winds blowing down the canyon. And fresh water is available from permanently flowing springs only a mile or so away.

Not unlike the Comanche and Apache who were to follow him, early man was a study in survival. The storehouses of nature were the "be all and end all" of his existence. Food, fiber, tools, and weapons had to be procured or produced from natural sources close at hand. Roasted, starchy centers of mescal and sotol, his dietary mainstay, were supplemented by the wild game that could be brought down with his atlatl darts and arrows or trapped in his primitive nets and snares. Perhaps larger game was obtained by stampeding the animals over a precipice. So far no evidence of tilling has been found, but roasting pits are visible at all elevations to indicate that early man followed

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[35]Ferdon, p. 25.

his ripening food supply from valley floor to mountain top. It is also reasonable to conclude that he had some time remaining to marvel at the splendor surrounding him, even if it were only in summer when his stomach was full, the night was warm, and his existence was secure.

In many ways the ancient inhabitant of West Texas was strongly akin to his modern counterpart. He struggled to adapt and to relate his own life to his surroundings as he fought to satisfy his physical needs. In this manner he formed habits, a way of life, and eventually a culture.

These archaic cultures have been only superficially investigated, but archeologists are patiently continuing their research as they study the numerous sites located within the proposed bounds of Guadalupe Mountains National Park. And certainly the archeologic story should be prominently featured in future interpretive programs at the park.

Recent History--Discovery, Exploration, and Settlement

Preceding the arrival of settlers at Plymouth Rock and Jamestown by over two-thirds of a century, Alvar Núñez Cabeza de Vaca meandered across the Southwest in 1530. A survivor of the Narváez expedition which had been shipwrecked on the Texas Gulf coast, De Vaca suffered hardships and ill-treatment as he wended his way toward Mexico. The castaway's trail through Texas has long been the subject of historical conjecture and speculation. Some authorities believe that the Spanish

adventurer's footsteps took him into the Davis Mountains, where he turned southward and crossed the Rio Grande near Lajitas.[36] Others hold the opinion that De Vaca crossed the Rio Grande "some distance above the place now called El Paso."[37] At any rate, in the summer of 1536, Cabeza de Vaca and three other survivors (including the Negro Esteban) arrived in Mexico City with exciting tales of their adventure to recount, as well as stories told to them by Indians of cities to the north which were aglitter with silver and gold.

The Spanish did not wait long before they followed up this accidental exploration. Only four years later the stamp of horses' hooves and the rattle of armor echoed across the expanse of this new land. Besides the beckon of unfound riches, another consideration lured the Spaniards northward. The King of Spain, a devout champion of Catholicism, saw here an opportunity to carry a knowledge of God to the heathen dwelling in the new territory.[38]

The expedition headed by Francisco Vásquez de Coronado discovered no treasures, but Coronado's claim to fame is secure due to his exploration of a vast, unknown area. Exploration was a prerequisite to the colonization that was not long in coming. By the 1560's, padres of the Franciscan order had established missions as far north as the Rio

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[36]Virginia Madison, The Big Bend Country (Albuquerque, N.Mex.: The University of New Mexico Press, 1949), p. 10.

[37]Herbert E. Bolton, Coronado Knight of Pueblos and Plains (Albuquerque, N.Mex.: The University of New Mexico Press, 1955), p. 15.

[38]George P. Hammond, Coronado's Seven Cities (Denver, Colo.: The W. H. Kistler Stationery Company, 1940), pp. 4-5.

Grande. Then in 1581, the energetic monk Fray Rodriguez proceeded northward along the Rio Grande into the fertile valleys of New Mexico where several tribes of sedentary Indians had established pueblos. The unfortunate Rodriguez and his companions lived among them for some time, but were finally set upon, robbed, and murdered.[39]

News of the fate of Rodriguez only served to spark a punitive and exploratory expedition led by Antonio de Espejo. Espejo journeyed northward until he reached the pueblos near present-day Santa Fe. Thence he turned eastward to the Pecos River which he christened Rio de las Vacas--River of the Cows--due to the numerous buffalo present in the area. Continuing southward along the west bank of the Pecos for 120 leagues, he roughly paralleled the eastern flank of the Guadalupes. It is not known whether Espejo actually spotted the Guadalupes, but it is still an oddity that the first two explorers to pass within 100 miles or so of the Guadalupe Mountains were Spaniards coming from the east and from the north![40]

Antonio de Espejo's tales of his travels did nothing to spur permanent settlement in the rugged mountains and on the arid plains of the Trans-Pecos. This event was to be left to a new breed of people who would not appear on the scene in significant numbers until more than 150 years had passed.

The Spanish explorers were appropriately named conquistadores,

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[39]Carlysle Graham Raht, The Romance of the Davis Mountains and the Big Bend Country (El Paso, Texas: Rahtbooks Co., 1919), pp. 28-29.

[40]Ibid., pp. 32-33.

because they were both conquerors and plunderers. They were armed adventurers looking for riches to confiscate and for the adulation that success would bring them. They would gladly endure the hardships imposed on them by a harsh nature and a rugged land with its savage inhabitants, so long as their sufferings were rewarded. But in the Trans-Pecos area neither glory nor treasure prompted further investigation. Therefore, the attention of New Spain was drawn to the more promising lands of the Tejas with its settlements centering around San Antonio and to the rich mines and fertile fields around Santa Fe.

So that these two trade territories as well as their missionary settlements might be linked together and protected at the same time, the Spanish built a line of presidios along the larger water courses of the Southwest. Several of these posts were constructed along the Rio Grande. This presidio system waxed for almost a century and then it waned and faded. By 1810 most of the fortifications had been abandoned.[41]

During all these years, the Guadalupes as well as most of the Trans-Pecos area remained a sanctuary for bands of Indians. After the garrisons stationed at the presidios withdrew, the Comanches roamed and raided with impunity deep into Mexico. Each year in September, in the full of the "Mexican moon," the Comanches would begin a journey of some 400 miles to the farms, ranches, and sleepy villages of Durango and Chihuahua. The great Comanche War Trail began in the Texas Panhandle then called the Llano Estacado or "staked plains," led across

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[41]Raht, p. 46.

monotonous flatlands inhabited by jackrabbits and antelope, crossed the Pecos River at Horsehead Crossing, continued to Comanche Springs (Fort Stockton), and finally proceeded to the Rio Grande and the rich hunting grounds beyond. Much livestock and other booty, as well as thousands of Mexican lives, were lost to the marauders.[42]

While the Comanches were nomadic horsemen who followed the buffalo, the Apaches were more settled, living in semi-permanent villages in their mountain retreats. Apaches and Comanches were inveterate enemies having only one thing in common--a hatred of Mexicans and later of white men.

The Indian problem was one unhappy circumstance among the many that had to be dealt with in 1848, when the Treaty of Guadalupe Hidalgo ended the Mexican War. By the terms of this treaty the United States obtained an enormous expanse of real estate--all lands north of the Rio Grande to El Paso and a line generally westward from there to the Pacific Ocean. Most of this new territory was terra incognita, and both victor and vanquished would have to cooperate in taming the Comanches and Apaches to whom a border line meant nothing.[43]

The United States readily agreed to an article guaranteeing Mexico protection from Indian depredations from north of the border; compliance with the article proved to be difficult. This protection could be provided only after a chain of military posts had been firmly established and garrisoned with troops of cavalry. Delays and some

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[42] Raht, p. 46.

[43] Ibid., p. 84.

unforeseen circumstances would be encountered before this task was completed.

Two events that transpired in 1849 made that year pivotal in the history of the Southwest. The first was the already mentioned Treaty of Guadalupe Hidalgo; the second was the discovery of gold in the millraces at Sutter's Fort in California. One opened the Southwest for American settlement. The other sparked a pell-mell race westward. Together, these two incidents had a very direct effect on the future of West Texas. Events which had been slow-paced during three centuries of Spanish and Mexican sovereignty now began to occur at a rapid, even hectic, rate. The era of Anglo expansion was underway.

Anticipating and secretly encouraging the rush for gold, the War Department in 1849 directed the U. S. Army to perform reconnaissance surveys into the Mexican cession. Two trails were explored between the Pecos River and El Paso. One passed through Limpia Canyon and the Davis Mountains. The second led through Guadalupe Pass. Both of these surveying parties were organized and directed by Brevet Lieutenant Colonel Joseph E. Johnston, chief topographical engineer of the Eighth Department. Some years later, this same officer was to distinguish himself in behalf of the Confederate cause during the War Between the States.[44]

Lieutenant Francis T. Bryan commanded the party of thirty men which made the first official visit to the Guadalupes. Lt. Bryan had

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[44]U.S., Congress, Senate, Reports of The Secretary of War with Reconnaissances of Routes from San Antonio to El Paso, Ex. Doc. No. 64, 31st Cong., 1st sess., July 24, 1850, pp. 26-27.

been ordered to investigate this northern route to El Paso, which had been earlier reported by trailblazer and Indian agent Major Robert S. Neighbors. His study proved this northern route to be several miles shorter than the Limpia Canyon trail and presented "no obstructions to the easy passage of wagons."[45] Grass and water were available within marches of twenty-five miles "except from the head of the Concho to the Pecos--a distance of sixty-eight miles, which is entirely without permanent water at present."[46] Thus the trail through Guadalupe Pass was established as a practicable, though imperfect, route between San Antonio and El Paso.

At this point it is necessary to digress and develop the prologue of circumstances for the next chapter in the Guadalupes' history. The treaty of peace signed at Guadalupe Hidalgo also included an article calling for a delineation of the boundary line between the United States and Mexico. So that the line might be physically determined on the terrain itself, a survey commission composed of officials from both nations was to be appointed. This commission would then jointly establish and mark the international line to the satisfaction of both the United States and Mexico.

After one false start and a change in personnel, John Russell Bartlett received the appointment as United States Boundary Commissioner. General García Condé served as Mexico's representative throughout the entire venture.

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[45] Ibid., p. 23.

[46] Ibid., p. 23.

It was Bartlett's intention as he stated in his Narrative to give such an accurate description of the country through which he passed that it would become "a useful guide to emigrants and other travelers . . . [since] a vast deal of suffering may be saved by placing in the hands of emigrating parties a guide across the country to the golden regions of California, whither so many are now annually wending."[47] Bartlett was well staffed to accomplish this purpose for his party consisted of botanists, zoologists, and mineralogists, as well as surveyors, topographical engineers, artists, and draftsmen.

Haste was imperative if Bartlett were to reach El Paso in time for the first session of the joint commission on November 1, 1850; consequently he took Lt. Bryan's shorter route via Guadalupe Pass. The presence of "recent Indian sign" and the wintery blast of a snow storm halted his party on Delaware Creek. With supplies running low and already being a week tardy for his scheduled meeting with Condé, Bartlett and a small detachment pushed on ahead of the main party. His march carried him across a portion of Guadalupe Mountains National Park. Bartlett took time to make very precise and descriptive entries in his journal, and it is to him that the best early description of the Guadalupes must be attributed:

> The road was quite tortuous, winding among and over hills, in a direction nearly west, towards the bold head

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[47] John Russell Bartlett, Personal Narrative of Explorations and Incidents in Texas, New Mexico, California, Sonora, and Chihuahua (Chicago: The Rio Grande Press, Inc., 1965), p. iv.

> of the great Guadalupe Mountain, which had been before us some eight or ten days. This is a most remarkable landmark, rising as it does far above all other objects, and terminating abruptly about three thousand feet above the surrounding plain. The sierra or mountain range which ends with it, comes from the northeast. . . . As it approaches its termination the color changes to a pure white, tinted with buff or light orange, presenting a beautiful contrast with other portions of the range, or with the azure blue of the sky beyond; for in this elevated region the heavens have a remarkable brilliancy and depth of color.[48]

As Bartlett neared El Paso he overtook a wagon train hauling government supplies bound for the same destination. Though it was not choked with traffic, already the northern route across the Pecos River was becoming better known and more often used.[49]

Countless articles and books have been written of trails and of travelers during this time when a contagion of gold fever swept the country. It is popular knowledge that the summer routes such as the Santa Fe, Oregon, and Mormon Trails were paths that led to riches in the golden West. That similar all-weather trails to the south were also used is not so well known. Large groups of emigrants en route to the gold fields trudged the southern routes. They were so numerous that often military escorts were assigned to them for protection. Fortunately for modern chroniclers, one of these escorts was commanded by Captain R. B. Marcy, a man keen of observation and faithful in his description of people, places, and incidents. Marcy's journals and accounts give excellent verbal sketches of these often raw times. After escorting one emigrant train from Fort Smith, Arkansas, to

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[48] Bartlett, p. 117.

[49] Ibid., pp. 123-124.

Santa Fe, he traveled through Guadalupe Pass on his return trip.[50] Some of his engaging descriptions of plant and animal life already have been alluded to in earlier sections.

While Marcy was bivouacked just east of the Guadalupes, he made a farsighted observation as he noted the recreation potential of this spot. Marcy recorded

> There are several [mineral] springs at this place, the waters of which unite and form the Delaware Creek. . . . Is it not within the scope of probabilities that these springs may be found to possess valuable medicinal properties, and that this place may yet (and at no very distant period) become a place of fashionable resort for the "upper-ten-thousand" of New Mexico? The climate here is delightful, the atmosphere perfectly elastic and pure, and the temperature uniform and delicious . . . .[51]

His prediction reflected the 1849 concept of recreation as being limited to an elite class and "pleasuring grounds" being comprised of resorts and spas.

As it has already been shown, gold was a catalyst in the settlement of western America. By the end of 1850, some 100,000 migrants had arrived in California as they pursued visions of "striking it rich"; another year increased the total to 300,000. By the time the intensity had cooled and the hardships of the journey were publicized, the West had so captured the imaginations of Americans that the exodus continued at a steady rate. Thus, the Pacific Coast states were settled many years before they would have been otherwise. However,

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[50] Randolph B. Marcy, The Prairie Traveler. A Handbook for Overland Expeditions (New York: Harper & Brothers, Publishers, 1859), pp. 15-16.

[51] Foreman, pp. 352-353.

time and distance still divided the nation in two. The necessity for more rapid communications between east and west ushered in the short but colorful epoch of the overland stagecoach.[52]

One of the most famous of these overland mail routes was the Butterfield Trail. In laying out this trail the Overland Mail Company reviewed maps and reports of military expeditions through the Southwest and after much controversy chose the "thirty-second parallel route." For the same reasons originally set forth by Lt. Bryan, the Butterfield Trail was routed through Guadalupe Pass, where the highest staging station on the entire length of the trail was established at the Pinery. There water, shelter, and forage were available.

Although the primary purpose for creating the Overland Mail Company, as the name indicates, was for carrying mail, passenger service was also provided. Several fine accounts of trips taken over the Butterfield Trail were written down by these travelers. One of them, Mr. W. L. Ormsby, who was a correspondent for the New York Herald, described a stop at the Pine Spring Station.

> We were obliged actually to beat our mules with rocks to make them go the remaining five miles to the station, which is called the Pinery, on account of the number of pine trees that grow in the gorge of the mountain in which it is situated. . . . We found the corral built of heavy pine timber--a very scarce article, indeed, except on the mountains--and after getting another stereotype meal, with the addition of some venison pie and baked beans, we started with a fresh team for a sixty mile ride, to the Cornudas Mountains, through the Guadalupe canyon.[53]

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[53]Waterman L. Ormsby, The Butterfield Overland Mail, ed. by Lyle H. Wright and Josephine M. Bynum (San Marino, Calif.: The Huntington Library, 1954), pp. 73-74.

The Pine Spring Station operated for only six months. Lack of water between the Guadalupe Mountains and the Pecos River proved to be so acute that the advantages provided by the shorter, easier route were sacrificed for an assured water supply further to the south through Limpia Canyon. But that venture, too, was short-lived.

Having begun on September 16, 1858, the mail stages operated with astonishing regularity between St. Louis and San Francisco for only two and one-half years. Although the Post Office Department lost a great deal of money on the overland mail, it was the impending Civil War, not financial considerations, that caused the stages to stop rolling along the Butterfield Trail. Lines of communications were later reestablished further to the north through Colorado where protection by Federal forces could be guaranteed.[54]

Tremendous changes had occurred in West Texas in little over a decade. By 1860, Fort Davis and Fort Stockton had been established; communities were springing to life in the Trans-Pecos, especially adjacent to such Army posts. El Paso and Presidio were bustling with activity as freighters hauled goods to and from Chihuahua. The Indian situation was almost under control. Raids were not uncommon, but they were not carried out with daring and impetuousness as they once were.[55]

Then, suddenly, a long-festering dispute flared into the armed confrontation of the Civil War. The Federals marched out of West

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[54] Ibid., p. 6.

[55] Raht, pp. 143-149

Texas, and the Confederates marched in, but little remained there to be protected. Most able-bodied men either had joined their favorite army or had gone to Mexico. As a result the redman regained most of his lost dominion. This time, however, it was only the Apache who inhabited the Trans-Pecos. The Comanches depended on the buffalo, and the depleted herds no longer roamed deep into Texas.

In 1867, victorious Federal troops reoccupied West Texas and rebuilt their forts. Then for the next fifteen years the cavalrymen performed escort and patrol duties, continually reducing the Indians' sphere of influence. By 1880, the Apaches were confined to reservations, and the Guadalupes were free for settlement.

After the Civil War, demand for cattle and cattle land had risen sharply. The industrial revolution was underway back East, and many people had left their farms in order to work in factories. Also, a spreading railroad network ameliorated transportation hardships and made cattle production feasible in the Great Plains states. As a result ranching became quickly established throughout West Texas and eastern New Mexico. Early cattlemen were drawn to those locations where permanent water and sufficient grass could be found, consequently they settled along the base of the Guadalupe escarpment. There springs were plentiful and enough browse was available for low density grazing by range cattle. At the higher elevations a scarcity of water largely restricted cattle ranching, but soon after the turn of the century sheep and goats were introduced.[56] In this manner a new group of

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[56] Investigation Report, pp. 31-32.

people took up residence around the Guadalupes and began to make permanent and wide-ranging demands of the land.

Contemporary History--The Long Road to National Park Status

The next chapter in the history of the Guadalupes was almost inevitable due to the competitive nature of American society and the resources and liabilities existing in West Texas.

A spirit of innovation was instilled in these new West Texans. But at the same time they attempted to modify their surroundings, they were also adapted to their environment. The impartial--often harsh--nature, which denied them easy prosperity, brought to the surface certain personal qualities in the Anglo-Americans. Self-reliance, a fierce independence, and a sort of frontier chivalry could be observed in individuals, as well as in their communities. In large part this was due to the sparse population, the great distances between communities, and the loneliness of ranch life which fostered common bonds among neighbors and evoked a natural friendliness toward newcomers. Besides western mystique, this warm hospitality has been responsible for making permanent citizens out of visitors and for bringing back many others to rediscover the accord which exists between the land and its people.

Finding new economic opportunities has long been a challenge in this region. Since the 1900's cattle, goat, and sheep ranching constituted both a livelihood and a way of life. More recently, irrigation wells have allowed limited quantities of cotton and grain

sorghum to be produced. The future, however, holds little promise of agricultural growth. Technological advances have benefitted other areas of Texas while the prevailing arid conditions of the Trans-Pecos would seem to preclude much agrarian expansion. Oil and gas discoveries brought flourishing bloom to nearby cities, but not to the region adjacent to the Guadalupes. Through the years the recreation industry has assumed more and more importance and points toward an even brighter future.

While the existence of Carlsbad Caverns had been known for many years under the name of "Bat Cave," knowledge of its beauty and magnitude was slow in coming to light. Finally, in the 1920's, attention of conservationists and adventurers was focused on the southeastern corner of New Mexico and the adjacent section of Texas. In 1924, the National Geographic Society organized an expedition to explore the caverns. During their stay there, the party visited El Capitan and "Guadalupe Canyon." In his later article on the expedition, Willis T. Lee voiced praises for the natural beauty and local color of the region.

> The mountains and plains in the vicinity of the national monument are scarcely less interesting than the cavern itself. . . . it is the Wild West, the land of the adobe shack, of range cattle and goats. The picturesque cowboy in sombrero and chaps is a familiar figure, and although the bandit no longer roams at large, men still living tell of adventures with Billy-the-Kid and Black Jack.[57]

Mr. Lee also mentioned that the State of Texas had selected this

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[57]Willis T. Lee, "New Discoveries in Carlsbad Caverns," National Geographic Magazine, September, 1925, pp. 316-317.

area for a state park. Although the map that accompanied the article did not coincide with his written description of the proposed state park site, it was certainly the El Capitan-McKittrick Canyon area to which Mr. Lee referred.

Representatives of both federal and state organizations have proposed other plans for the Guadalupes. All have agreed that the area possessed significant park potential, but for many years no action was taken. In 1938, the Narrative Report on McKittrick Canyon was submitted to the Texas State Parks Board. It praised the area and recommended its development as "the finest state park in Texas."[58] Then later, in 1945, a National Park Service study suggested that the State of Texas acquire the McKittrick Canyon-Guadalupe Peak acreage. This latter report further proposed that the federal government should accept the tract if it were ever to be offered to them.[59] Additional investigations with favorable conclusions were made by the Southwest Region of the National Park Service in April of 1958 and May of 1961.

Almost all the acreage comprising the McKittrick Canyon-Guadalupe Peak tract had been consolidated under the ownership of Mr. Wallace E. Pratt and Mr. J. C. Hunter, Sr. Due to the conservation practices implemented by these two men, the choice sections of the acreage had been kept in near pristine condition for some forty years. But it was Mr. Pratt himself who indicated that his and Mr. Hunter's efforts toward preservation must eventually fail when he testified: "It is

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[58] Investigation Report, pp. 7-8.

[59] Ibid., p. 8.

impossible for private ownership to protect natural scenes and exhibits of this character from vandalism and harassment of wildlife. I think the only permanent solution to this problem is [federal] ownership . . . ."[60] In 1959, Mr. Pratt offered his 5,632-acre ranch, which included most of South McKittrick Canyon, as a donation to the National Park Service. His offer was accepted, and a milestone toward eventual designation as a national park was reached.

By this time the movement was gaining momentum. In January, 1963, Congressman-at-Large Joe Pool introduced a bill calling for the Department of Interior to conduct a feasibility study for a national park in the Guadalupe Mountains. This study was concluded in the fall of 1963, with a very favorable recommendation. Later in that same year, members of the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments spent a night in the Guadalupe high country on an inspection trip; they were unanimous in their endorsement. Secretary of Interior Udall was favorably impressed when he visited the area in November of 1964. Finally, in 1965, a bill to create Guadalupe Mountains National Park was introduced in Congress by Senator Ralph Yarborough. Hearings were held before a subcommittee of the Senate Committee of Interior and Insular Affairs on July 21, 1965, and August 9, 1966. Testimony at these hearings indicated massive public support in favor of the bill.[61] By October 10, 1966, the bill had been considered and passed by both houses of Congress;

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[60] Hearings, p. 20.

[61] Ibid., pp. iv-11.

and on October 15, 1966, President Johnson signed P.L. 89-667, thus authorizing the establishment of the Guadalupe Mountains National Park.[62]

Subsequent investigations and hearings have delayed the passage of implementing legislation through 1968. Now the barrier that must be overridden before development can begin is one of money. As soon as all land has been purchased development can be initiated.

Regional Factors

Numerous are the bonds tying communities and even isolated single-unit dwellings together to form interactions on a regional basis. A common heritage, a likeness in topographical and climatic features, and similarities in occupational interests foster thinking on less esoteric, more ubiquitous, terms. Some of these bonds have already been discussed. However, there are other interrelationships stemming mainly from proximity with the three recreational facilities which require additional consideration, because they influence the region (Trans-Pecos Texas and southeastern New Mexico) as a whole.

Location

Guadalupe Mountains National Park, spreading some twelve miles east to west and some thirteen miles north to south, is located in Culberson and Hudspeth Counties in West Texas. The park abuts the New Mexico border on the north where it adjoins Lincoln National Forest. Carlsbad Caverns National Park lies directly east of the

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[62] Douglas, p. 184.

national forest, but is separated from its new counterpart by little more than five air miles. El Paso is 115 miles to the west; Dallas is 500 miles to the east. A 500-mile radius from Guadalupe would include the cities of Dallas, Fort Worth, Albuquerque, Santa Fe, Tucson, Phoenix, El Paso, San Antonio, Lubbock, Amarillo, Odessa, and Oklahoma City (see Fig. 3).

Encompassing 77,582 acres--indeed the very heart of the mountain range for which it was named--Guadalupe Mountains National Park is strategically situated in an expansive and sparsely populated section of Texas. Distances in this part of the country are often measured as much in driving time as in miles. Thus, it is only thirty minutes by highway to Carlsbad Caverns; and less than a three hours' drive is necessary in traveling to the Davis Mountains and Fort Davis National Historic Site. Then from Fort Davis it is little more than a two-hour journey southward to Big Bend National Park.

Traffic

The traffic pattern in this part of the Southwest is uncomplicated. Interstate 10 from San Antonio and Interstate 20 from the Dallas-Fort Worth area both lead toward El Paso. These two superhighways converge some seventy-five miles southeast of Guadalupe Mountains National Park. About 300 miles to the north, Interstate 40 (better known as Route 66) links Amarillo and Albuquerque.[63] The remaining territory is spanned by a rather sparse network of federal and state highways.

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[63]Robert P. Jordan, "Our Growing Interstate Highway System," National Geographic Magazine, February, 1968, pp. 216-217.

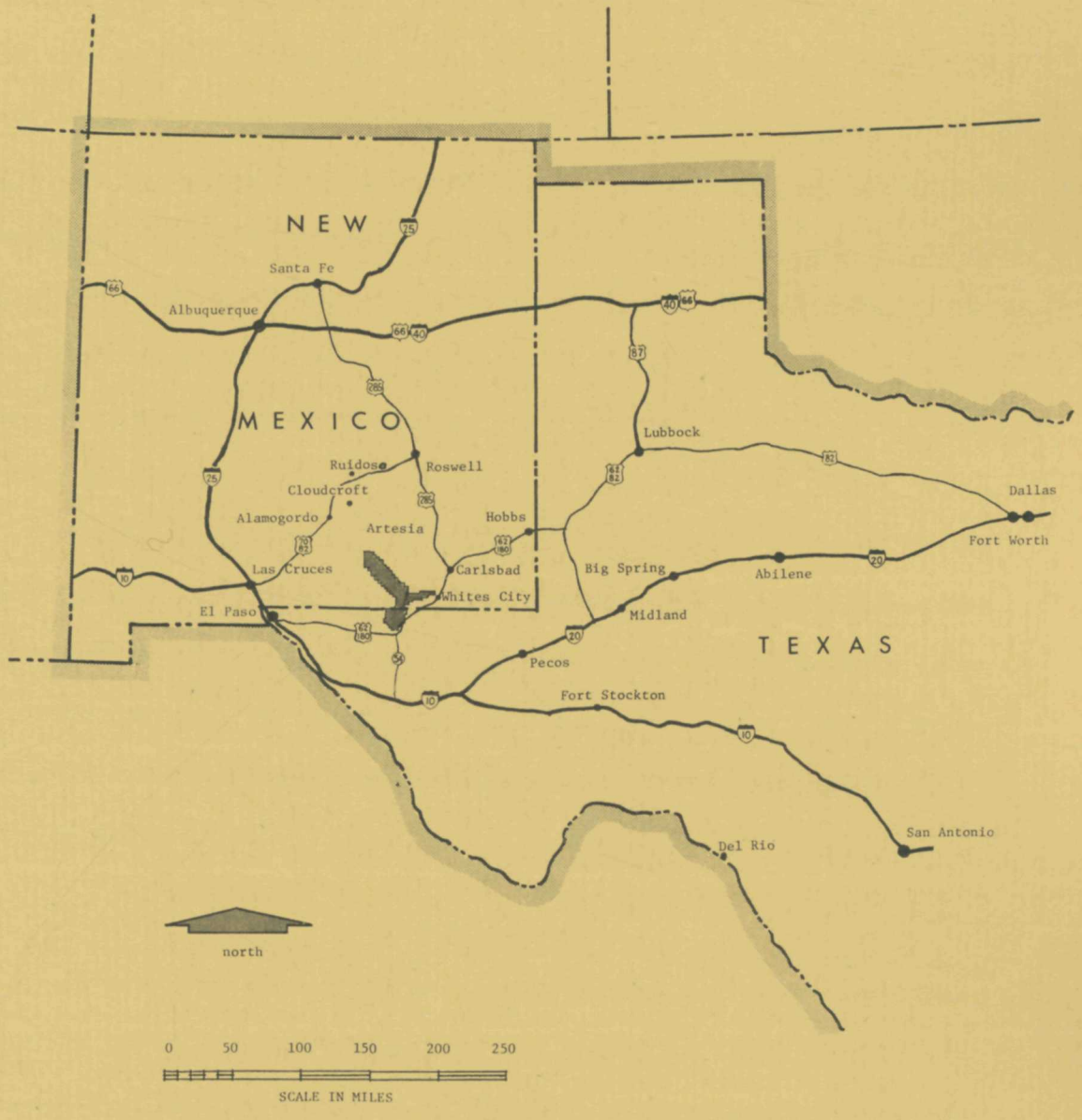

Figure 3. Vicinity Map with Traffic Pattern

Running parallel to the Guadalupe Range's eastern escarpment is U.S. Highway 62-180. This is one of the main traffic arteries across West Texas, being a four-lane divided highway for a portion of its length. Travelers bound either north or south through Hobbs, Carlsbad, or Roswell must use U.S. 62-180. A considerable volume of traffic is generated along this route as it is the shortest distance between the Texas Panhandle and El Paso. Going southward from Carlsbad, this highway leads through Whites City at the entrance to Carlsbad Caverns National Park, passes by Guadalupe's proposed entrance, and then winds through Guadalupe Pass beneath the domineering countenance of El Capitan.

Many national parks are situated in isolated locations. (Big Bend is one example of this.) But Guadalupe is readily accessible. As a matter of fact, if a traveler along U.S. 62-180 were to pause at Pine Springs, he could climb up the canyon behind the old stage station and find majestic--almost wilderness--terrain within only two or three miles.

Regional Economics

An economic base often has little regard for imaginary lines, such as the state line separating the region in Texas west of the Pecos River and that portion of New Mexico immediately to the north. These two geographic entities have long been ranching and irrigated farming areas, and for many years individuals residing on opposite sides of the border have joined together for common business ventures.

Being aware of de facto regional economic interrelationships,

these same individuals, as well as their political representatives, have formed a consolidated and vocal force to champion the cause of an expanding tourist industry.[64] For some years now leaders both in Texas and New Mexico have cast a lucrative eye on the "new" dollars tourists bring to their state's economy. Some measure of the impact of tourism on a large scale was illustrated in Texas in 1965, when tourism accounted for over one billion dollars for the first time in the state's history. Similar boom years were experienced in 1966 and 1967, and the tremendous monetary outlays resulting from Hemisfair in 1968 have not yet been fully evaluated. Meanwhile, in 1964 in New Mexico, according to Senator Joseph M. Montoya, state-wide tourism there accounted for some $160 million, while 587,957 visitors to Carlsbad Caverns left behind approximately $7,000,000 with local and area business enterprises.[65] Obviously, both states are vitally interested in promoting any new recreational spot which would be mutually advantageous. So when the issue of Guadalupe's establishment came before the U.S. Congress, there were as many proponents present from New Mexico as from Texas. Besides Senator Montoya, a listing of some of the prominent New Mexicans lobbying for passage of the bill included Attorney General Boston E. Witt, the mayor of Carlsbad, representatives of the Carlsbad Chamber of Commerce, the city

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[64] Closing of Carlsbad Caverns for two days a week beginning in December of 1968 as a part of a spending cutback initiated by Congress prompted an indignant public outcry. State officials, including Governor Cargo, vowed to be unrelenting in their efforts until the Caverns were reopened on a seven-days-a-week basis.

[65] Hearings, pp. 12-14.

attorney of Carlsbad, and many other interested citizens from Hobbs, Jal, and Carlsbad. One common reason for their appearance was that a new national park nearby would enhance their own economic positions. Attorney General Witt expressed the mood of all when he summarized southeastern New Mexico's state of affairs in the following manner:

> The economy of many New Mexico towns is oriented toward serving vacationers and tourists. There is little, if any, likelihood that this situation will change materially in the foreseeable future. It follows then that what best serves to promote and protect and so to strengthen this tourist industry best serves the interest of New Mexico and its individual communities. The purpose of the establishment of the proposed Guadalupe Mountains National Park is to preserve for all time the unique natural and historical features of this rare area. Since there are already attractions in the southeastern part of our State such as the Carlsbad Caverns National Park and the White Sands National Monument that have been directly responsible for a large part of the development of the area's economy, the establishment of the Guadalupe National Park cannot be considered as being in conflict with the interests of New Mexico, or of its communities. In fact, we think the area . . . will complement rather than detract from our own national parks located in close proximity thereto.[66]

It is apparent that community economies on a regional scale will be affected along three avenues by the establishment of Guadalupe Mountains National Park. Most obviously, the presence of the new park will be an additional drawing card which will strengthen the whole economic structure of the region by enlarging the tourist industry both laterally and vertically. Secondly, a considerable amount of construction (up to $10,362,000 in funds for development has been authorized[67]) will be necessary before the park can properly serve

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[66] Ibid., p. 27.

[67] P.L. 89-667, p. 3.

a wide range of visitors. And thirdly, there will be a surge of economic activity resulting from an increase in services and commercial enterprises needed by the additional persons to be employed at the new park.

A Recreation Region

Much of the basis of this thesis is predicated on a portion of the recreational demand being absorbed by two adjacent facilities: Carlsbad Caverns and the Guadalupe Mountains Ranger District of Lincoln National Forest. At both locations may be found singular recreation attractions that either could not be duplicated or not be emphasized at Guadalupe.

The content and magnitude of programs at these two facilities will now be examined.

Lincoln National Forest

Lincoln National Forest, known by most Americans as the birthplace of Smokey Bear, is more than just a timber preserve. Production of timber and forest products is one important function of a national forest, but it is not the sole reason for its being set aside. Today, through Multiple Use Management techniques, forest lands are administered so as to furnish a continuing supply of five renewable resources: timber, wildlife, water, forage, and recreation.

According to Forest Service officials, outdoor recreation is the fastest growing forest use at Lincoln National Forest (see Table 1). Recreation visitation has increased by over one million visits in the

TABLE 1

RECREATIONAL USAGE OF GUADALUPE RANGER DISTRICT, LINCOLN NATIONAL FOREST, DURING 1967[a]

Activity	Visitor-days Use	Percent of Total
Enjoy unique/unusual environment (spelunking)	2,500	1.5
Auto (drive-motor)	50,100	29.4
Scooter-motorcycle (drive-motor)	1,100	.6
Foot (hiking-walking)	5,700	3.4
Horse (horseback riding)	3,900	2.3
Camping, general	11,400	6.7
Camping, auto	7,200	4.2
Camping, trailer	2,800	1.7
Camping, tent	3,500	2.0
Picnicking	9,300	5.5
Hunting, big game	65,500	38.5
Hunting, small game	1,200	.7
Hunting, upland birds	600	.4
Nature study	4,200	2.5
Gathering forest products	1,100	.6
Total	170,100	100.0

[a]Source: U.S. Department of Agriculture, Forest Service, Lincoln National Forest, Guadalupe Ranger District.

decade from 1954 to 1964.[68] It has been skiing and associated winter sports which have been responsible for a large portion of the increase in recreation usage. Two of the nation's southernmost ski areas are either totally or partially within the national forest--at Cloudcroft and Sierra Blanca. Picnic and camping facilities have been placed throughout the mountains at points possessing special scenic charm or at heavily-used locations. Hunters and fishermen flock to Lincoln National Forest. Three species of deer can be hunted, and some prize bucks may weigh more than 250 pounds. Other game animals include elk, black bear, turkey, and several small game birds; however, the hunting season is relatively short. Rainbow and native trout may be taken from the cold mountain streams.

The extensiveness of Lincoln National Forest has dictated its division for proper management. It has been partitioned into six sizeable ranger districts. Also, the forest is not a single whole tract, but is divided into three widely separated acreages. The southernmost acreage, which forms the Guadalupe Mountains Ranger District, is the one having a direct bearing on this study. The somewhat less than 300,000 acres of this district include most of the remaining Guadalupe Mountain Range that extends northward from the Texas border.

Complete flexibility and over-emphasis cannot be granted to a national forest's recreation program without damaging or excluding

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[68] U.S., Department of Agriculture, The Lincoln National Forest Works for You! (Washington, D.C.: Government Printing Office, 1964), pp. 1-3.

other resource utilization. Therefore, both scale and scope of recreation opportunities offered in a national forest are restricted in many respects. As have already been noted, hunting, fishing, hiking, and limited camping and picnicking activities are compatible with the production of timber, the grazing of livestock, the maintenance of wildlife populations, and the conservation of water. Thus certain active outdoor recreation pursuits can be enjoyed by individuals or groups without staff assistance in this district of Lincoln National Forest. Neither interpretation nor supervised programming is a prime responsibility of the Forest Service.

Carlsbad Caverns National Park

The exact names, dates, and circumstances pertaining to the discovery of the great caverns near Carlsbad, New Mexico, have been long obscured. Although numerous claims of discovery have been made, each claim has its discreditors. Vague, too, are the authentic first "tourists" to be guided into the caverns. Yet, since 1924, when the keeping of records was initiated by the National Park Service, over thirteen million visitors have come to Carlsbad Caverns, with its subterranean beauty nonpareil. It was a desire to view for themselves the huge underground chambers, the galleries of stalagmites and stalactites, and the evening flight of the nocturnal bats which lured these people from all parts of the nation.

An examination of formal visitation records from 1924 through 1967 indicates a strong and continuing upward trend (see Fig. 4). Beginning in 1924 when 1,876 visitors toured the caverns through 1967

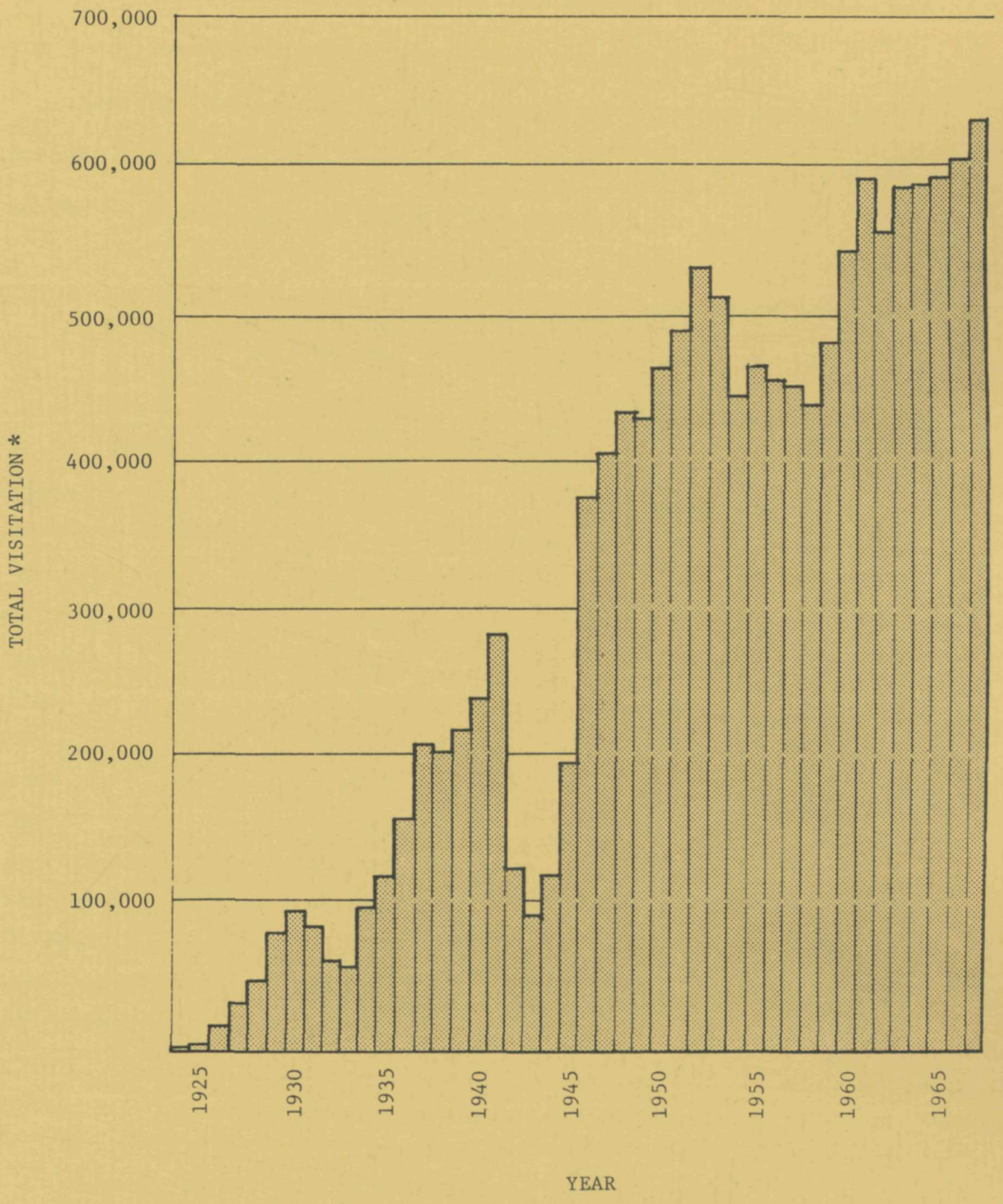

Figure 4. Annual Visitation at Carlsbad Caverns National Park, 1924-1967.

*Source: Staff at Carlsbad Caverns National Park.

when the number swelled to 630,770, the average annual increase for the forty-three year period was 14,625 visitors per year.

Seasonal variations follow a consistent pattern; summer is the busiest season with two-thirds of all visits being made during the months of June, July, and August (see Table 2).

TABLE 2

NUMBER OF VISITORS BY MONTH FOR 1967
AT CARLSBAD CAVERNS NATIONAL PARK[a]

Month	Total Number of Visitors	Percent of Annual Total
January	16,149	2.6
February	15,620	2.4
March	29,992	4.8
April	23,515	3.7
May	33,873	5.4
June	117,072	18.6
July	148,545	23.6
August	145,083	23.0
September	42,942	6.8
October	23,604	3.7
November	18,855	3.0
December	15,520	2.4
Total	630,770	100.0

[a]Source: Staff at Carlsbad Caverns National Park. This tabulation includes visits to McKittrick Canyon, an administrative unit of Carlsbad Caverns National Park.

An expanded summer tour schedule features thirteen complete walk-in tours each day, plus continuous semiconducted tours of the Big Room, and an evening bat flight program. Within the Visitor Center an enlightening display area depicts phenomena of the caverns' formation. All of the above interpretive programs are directly concerned with the caverns. The only other interpretation at Carlsbad Caverns is subordinate to this main theme and consists of self-explanatory devices. For those who are especially motivated, a nature trail has been constructed; and with the aid of a keyed guide booklet tourists can acquaint themselves with some of the native desert plants, their characteristics, and their peculiarities. Additionally, along the highway leading to the Visitor Center several plant identification markers have been installed at roadside turnouts.

Facilities within the park are extremely limited. At the Visitor Center are located a restaurant, curio shop, nursery, and kennels. These facilities, as well as the underground lunchroom, are operated by a concessionaire, the Cavern Supply Company. During the peak summer periods, these are all operated at near capacity levels. Parking lots at the Visitor Center also are crowded almost to their limit at busy periods. There are no overnight accommodations of any kind in the park; therefore, visitors must rely on motel, hotel, and camping facilities in the surrounding region.

CHAPTER III

METHODOLOGY

Famous both nationally and internationally, Carlsbad Caverns has long been a magnet to draw tourists and vacationers to the southeastern corner of New Mexico and adjacent West Texas. At this time Guadalupe Mountains National Park is largely unknown, except to a group of conservationists, biologists, and geologists who are students of its unique features. This lack of acclaim will be remedied when Guadalupe becomes fully operational and the public learns of the new park's availability.

As for the future, some characteristics--points of origin, number per party, travel patterns--of visitors to this geographic area will not change greatly. However, other characteristics of these visitors, such as length of stay, amount of money spent, and activities enjoyed within the area, may be changed. In order to make the best possible use of recreational resources, it is important to find out as much as possible about the people who will use them. A determination of wants and habits of current visitors within the immediate vicinity would give some indication of the characteristics of future visitors.

Thus, the purpose of the survey conducted as a part of this thesis was to check the validity of certain hypotheses relative to the area and to discover more about the characteristics and interests of

Carlsbad Caverns visitors. Information gained from this survey refers specifically to Carlsbad Caverns National Park, but some conditional inferences relative to Guadalupe may also be drawn.

Survey Procedures

Procedures for this survey were designed to fit circumstances of physical layout, scheduled interpretive programs, and limitations imposed by time and funds available. These considerations dictated the techniques and methods which were used in conducting the survey.

Aspects of Recreation Programs Affecting Survey Design

As has already been established, Carlsbad Caverns National Park offers three basic recreational activities for the enjoyment of park visitors: walk-in tours, elevator tours, and the bat flight program. Each of these activities presented special problems in sampling and in distributing, completing, and returning questionnaires. A brief summary of each activity will be presented along with procedures which were adopted for interviewing participants in the activity.

Walk-in Tours

Cavern tours are normally conducted on a seven-days-a-week basis. The walk-in tour, a three-mile trip beginning at the caverns' natural entrance, takes some three and a half hours to complete. It is rather strenuous, as it descends by way of a paved serpentine trail for some 800 feet below the surface. The first portion of this tour progresses through the Green Lake Room, King's Palace, Queen's

Chamber, Papoose Room, and finally terminates at the underground lunchroom. The second portion of the trip is an informal walk around the Big Room. Guides are posted at intervals along the carefully designed trail to answer questions, and visitors are allowed to enjoy the stroll at their leisure. Seasonal alterations are made in the walk-in tour schedule. During the summer months, tours commence at 7:00 A.M. and continue at forty-five minute intervals until mid-afternoon (for a daily total of thirteen tours). In the remaining months of the year tours are conducted on a reduced schedule.

The summer schedule of operation for the walk-in tours during the period in which this survey was conducted is listed as Table 3.

TABLE 3

SUMMER WALK-IN TOUR SCHEDULE FOR CARLSBAD CAVERNS NATIONAL PARK[a]

Tour Number	Begin	End
1	7:00 A.M.	10:30 A.M.
2	7:45 A.M.	11:15 A.M.
3	8:30 A.M.	12:00 noon
4	9:15 A.M.	12:45 P.M.
5	10:00 A.M.	1:30 P.M.
6	10:45 A.M.	2:15 P.M.
7	11:30 A.M.	3:00 P.M.
8	12:15 P.M.	3:45 P.M.
9	1:00 P.M.	4:30 P.M.
10	1:45 P.M.	5:15 P.M.
11	2:30 P.M.	6:00 P.M.
12	3:15 P.M.	6:45 P.M.
13	4:00 P.M.	7:30 P.M.

[a]Source: Staff at Carlsbad Caverns National Park. Effective dates for this schedule were June 9 through September 2, 1968.

Elevator Tours

Visitors who feel they are physically unable to make the complete walk-in tour may see some of the caverns' grandest sights by taking the elevator down to the Big Room. Elevator trips are conducted on a continuing basis from 9:00 A.M. to 5:45 P.M. each day. Many people take the elevator down to rejoin friends or other members of their families, who had walked in, at the underground lunchroom. Then they could continue the tour together through the Big Room.

Bat Flight Program

At sunset each summer evening huge crowds assemble at the amphitheater in front of the natural entrance to the caverns to observe the bats' nightly exodus. The bats do not always depart according to a schedule; hence, the crowd gathers well in advance of the expected flight time to listen to a park naturalist explain characteristics of the bats in some detail.

This is a free program, and all visitors may come and go as they please.

Population Sampled

The population sampled was all visitors participating in at least one of the three officially supervised recreation activities at Carlsbad Caverns National Park during the week of August 13-19, 1968.

Sample Size

The sample size was set at two and one-half percent of expected park visitors for the selected week of August, 1968. Survey respondents

were instructed to reply not only for themselves, but also for all other members of their party; therefore, tabulated data applies to a much larger segment of the park's visitors. It was inferred from data collected during a pretest of the questionnaire that an average party would consist of four persons. If this proved to be true, the expanded sample size would be approximately 10 percent of the population to be surveyed. Final figures indicate that 801 parties were queried and that the actual expanded sample size was somewhat smaller than was expected (only 7.8 percent of total visitation during the survey period).

Questionnaire

The questionnaire was similar to one used for the Grand Canyon Travel Survey conducted by the Arizona Highway Department and the U.S. Department of Commerce in cooperation with the National Park Service.[69] Several modifications were made to adapt the questionnaire to Carlsbad Caverns and at the same time to yield additional information which would pertain to nearby Guadalupe Mountains National Park. The questionnaire was designed and questions were selected in such a manner that respondents would need only three or four minutes to fill out the form.

A test of the questionnaire was conducted a month prior to the actual survey period.

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[69] Division of Economics and Statistics, Arizona Highway Department; Bureau of Public Roads; U.S. Department of Commerce; in cooperation with National Park Service, U.S. Department of Interior, Grand Canyon Travel Survey (n.p., [1955]), p. 39.

Questionnaires were printed on 17 x 11 inch yellow card stock, which resulted in an 8½ x 11 inch booklet when folded in half. This size and format was chosen for its appeal and functional characteristics. The card stock was sturdy enough to allow marking without the need for a table or stiff backing material. Placement of all questions on the inside facing pages resulted from experience gained during pretesting of the questionnaire. Respondents had demonstrated a tendency only to answer questions on the front side of a questionnaire printed on both sides of a single page. The layout and sketch on the front page, as well as the yellow color of the card stock, were chosen to make the questionnaire more appealing for those individuals who constituted the sample. (Contents of the questionnaire are presented as Appendix I.)

Effects of Physical Layout on Survey Procedure

All activities at Carlsbad Caverns revolve around the Visitor Center. Tickets for both the elevator and walk-in tours are on sale at the booth located in the lobby. The elevators are located in the Visitor Center. Beginning at the steps of the building's east side, a one-fourth mile long trail leads down to the natural entrance where an amphitheater of native limestone has been constructed adjacent to the huge opening. At this location visitors congregate at dusk for the bat flight program. It is also the starting point for walk-in tours.

Twenty minutes before a walk-in tour is scheduled to begin, all those who hold tickets may proceed to the amphitheater. There, they

are met by uniformed personnel who accept their tickets and allow tour members to continue down a paved trail for some 200 yards, until a chain halts further progress. At this point visitors are just inside the yawning cavity where they are protected from the often sweltering desert heat or an occasional summer shower. Thus, they can wait comfortably on stone benches during the remaining fifteen minutes or so until all tour members have assembled and the group is ready to depart. This spot was selected as the best location for surveying members of walk-in tours. Respondents were seated and could easily fill out a questionnaire; also, they were necessarily waiting for the tour to begin and did not feel as though they were being imposed upon. Beyond this point there is no practical opportunity for conducting a survey. When a tour leaves the assembly area, one guide is posted at the front and one at the rear of the column, while a third (and sometimes a fourth) guide roves through the group answering questions. The guide at the front flips on the light switches as they proceed so that both the trail and the cavern formations are illuminated. Bringing up the rear of the tour, the last guide turns off all the lights. Safety chains and retaining walls insure that all tour members stay on the trail until the underground lunchroom is reached.

Elevator tours are not conducted on a scheduled basis. At any time, groups or individuals may take the high-speed elevator from the lobby of the Visitor Center down to the underground lunchroom, which is located 754 feet directly below. Only a short distance away from

there, the Big Room tour begins. Signs, arrows, and uniformed personnel guide visitors along the relatively level trail through the fourteen-acre Big Room. Since the second segment of a walk-in tour duplicates this tour, members of both tours are quickly intermingled. Everyone returns to the surface via elevator, hence surveying procedures were restricted. The only time that elevator tour visitors could be exclusively sampled was just as they stepped from the elevator. Fortunately, adequate light was available there, and a nearby information desk provided a place to fill out the questionnaire.

Being presented at the amphitheater, the bat flight program was a less than ideal arrangement for conducting a survey. There are three entrances to the seating area; but visitors also can step over a low wall to reach a seat, and many late-comers just stand on the hard-surfaced area overlooking the amphitheater. Generally the program is conducted each evening between dusk and darkness. It was necessary, therefore, to take survey samples prior to the beginning of the program, while sufficient light was available. Anxious crowds do congregate well in advance of the program's announced starting time, and most of these visitors take a seat within the amphitheater. Thus, the sample for this activity was taken from the group of visitors who came early and sat in the amphitheater.

A questionnaire and pencil were handed to the apparent head of each selected party, and he was asked to please fill out the form. At the same time he was also told how to dispose of his completed questionnaire: walk-in tour visitors dropped them in a marked box as the tour filed past; elevator tour visitors left them in a container

on the information desk; and visitors to the bat flight program kept their questionnaires until they were collected by the interviewer.

Sampling Technique

Systematic techniques were used in selecting the sample. The population of Carlsbad Caverns visitors was already stratified according to three recreational activities. Each of these activities was divided on a daily basis; one, the walk-in tour, was subdivided on a tour basis. Every effort was taken to make the sample as representative as circumstances would allow.

As was previously mentioned, thirteen walk-in tours were scheduled each day. Noon (12:00 o'clock) was used as the point for dividing the tours into "morning" and "afternoon" classifications. Sampling without replacement then was used so that each tour would be represented in the final tabulations. For each day, two tours in the morning and two tours in the afternoon were randomly selected.

In comparison to the magnitude of walk-in visitation, elevator tours and the bat flight program are small; however, they comprise and represent a different segment of park visitation. Both were sampled. Two days were chosen at random to survey each of these activities. Since elevator tours were conducted concurrently with walk-in tours, sampling in the Big Room was conducted during the interviewer's "off periods" throughout the day. For the bat flight activity, the amphitheater was divided into sections and one section was chosen at random. Early-arriving parties to that section then were handed a questionnaire to complete. See Table 4 for this schedule.

TABLE 4

SCHEDULE OF TOURS OR ACTIVITIES
CONSTITUTING SURVEY SAMPLE

Date	Walk-in Tours		Elevator	Bat
	Morning	Afternoon	Tour	Flight
Tuesday, August 13	7:00 11:30	1:45 3:15		
Wednesday, August 14	7:00 9:15	1:45 3:15	X	
Thursday, August 15	8:30 10:45	12:15 2:30		X
Friday, August 16	7:45 11:30	1:00 1:45		
Saturday, August 17	7:45 9:15	2:30 12:15		
Sunday, August 18	7:00 10:45	3:15 4:00		X
Monday, August 19	8:30 10:00	12:15 2:30	X	

For reasons already enumerated, completely random selection of parties within each tour or activity was not practical.

Assembly and Analysis of Data

After all samples were taken, each questionnaire was checked and coded. The information was then punched on computer cards, and appropriate statistical tests were performed at Texas Technological College's computer center. The major and most relevant data will be presented in the following chapter.

CHAPTER IV

SURVEY RESULTS

Source of Visitors

Probably no criterion better reflects the significance and acclaim of a park facility than the source of its users. It is this national or international appeal which qualifies superlative land parcels to be distinguished from less spectacular park acreages that serve a more provincial need or meet a more limited demand. In order to fulfill its mandate, a national park should be used by a wide cross section of the nation.

Carlsbad Caverns visitors come from almost every section of the nation (see Table 5 and Fig. 5). Forty-five states were represented by survey respondents; only the five states of North Dakota, Wyoming, Rhode Island, Vermont, and Alaska were not named by respondents as a home state. One percent or more of the total sample was supplied by each of twenty-one states. There were six parties from foreign countries.

Regarding the state of origin of Carlsbad Caverns visitors, two tendencies in interaction may be observed. Firstly, all other things being equal, those states with the largest populations should tend to be the source of the highest percentages of park visitors. Secondly, as the distance from the state of origin to Carlsbad Caverns increases,

TABLE 5

SOURCE OF VISITORS[a]

State or Country	Total Number of Parties	Percentage
Texas	257	32.1
California	111	13.9
New Mexico	46	5.7
Oklahoma	36	4.5
Louisiana	30	3.8
Colorado	23	2.9
Illinois	23	2.9
Missouri	22	2.7
New York	21	2.6
Kansas	19	2.4
Arizona	18	2.3
Ohio	16	2.0
Pennsylvania	16	2.0
Florida	14	1.8
Iowa	14	1.8
Michigan	14	1.8
Arkansas	12	1.5
Indiana	9	1.1
Maryland	9	1.1
Georgia	8	1.0
Wisconsin	8	1.0
All other states and countries	75	9.1
	801	100.0

[a]Source: Survey data. States represented by 1.0 or more percent of total sample.

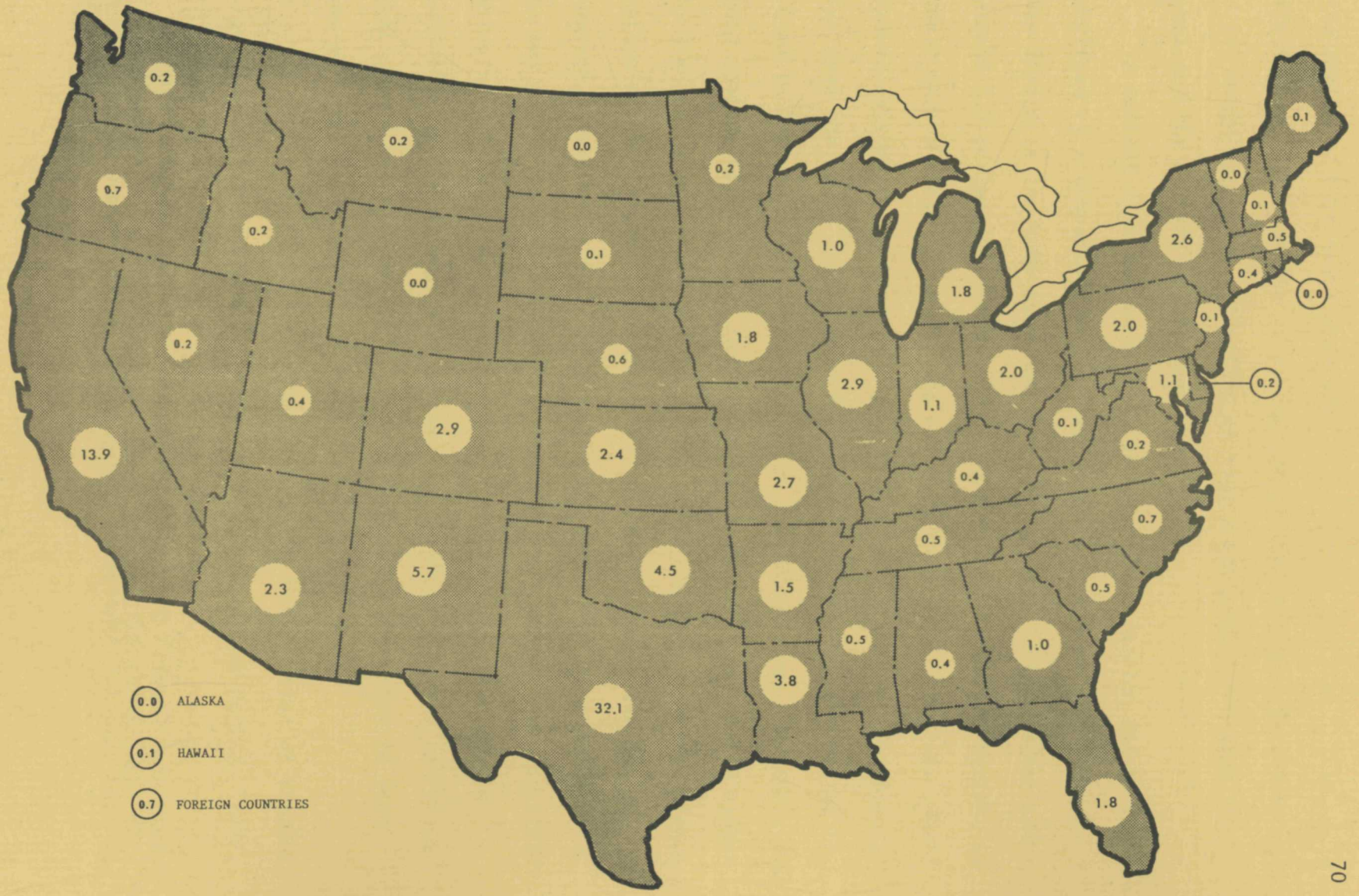

Figure 5. Percentage of Surveyed Parties by States of Origin

the number of park users from that state should diminish. This would imply that the frequency or percentage of visitors contributed by each state would appear as a function of that state's distance from the park and the state's population.

A measure of these tendencies and their interaction can be readily verified by a comparison between New Mexico, California, and Texas. New Mexico is the home state of Carlsbad Caverns. New Mexicans comprised 5.7 percent of the total visitors during the survey period, as their native state secured third place in the overall ranking. When viewed nationally on the basis of its population, New Mexico appears far down the list.[70] Its move from thirty-seventh on that roster to third in the survey is actually a quite impressive jump. On the other hand California--now our nation's most populous state--placed second in the survey with 13.9 percent of the total, despite a physical separation of almost one thousand miles. Neither of these two states, however, could match the mark posted by Texas. Bordering New Mexico on two sides, Texas lies both ten miles to the south and seventy-five miles to the east. At the same time, the Lone Star State is the nation's sixth most populated state. It is not surprising therefore that one of every three visitors to Carlsbad Caverns National Park was a Texan.

Of these two tendencies, proximity is in the position of highest significance. The example provided by the case of New Mexico, Texas,

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[70]U.S., Department of Commerce, Bureau of the Census, U.S. Census of Population: 1960, Vol. I, Characteristics of the Population. Part I, United States Summary (Washington, D.C.: Government Printing Office, 1964), p. S 31.

and California is weighted in favor of proximity. The fact that the relatively nearby states of Oklahoma, Louisiana, and Colorado placed fourth, fifth, and sixth, respectively, lends additional credence to the statement. This point is further substantiated by a comparison between Carlsbad Caverns' home state plus its four contiguous neighbors and the nation's five most populous states. Over 47 percent of Carlsbad Caverns visitors listed New Mexico, Arizona, Colorado, Texas, or Oklahoma as their home state. (Utah is contiguous to New Mexico only in the strictest interpretation of the word; hence, it was not included in this grouping.) With regard to their populations, California, New York, Pennsylvania, Illinois, and Ohio are top-ranked nationally; but they supplied a combined total of just 25 percent of the visitors surveyed.

Thus, it follows that Carlsbad Caverns is used most by states close to the park; but also that among the states in the Caverns' adjacent hinterland, it is those states with the largest populations which supply the most visitors to the recreational facility.[71]

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[71]Also during the summer of 1968, the staff at Carlsbad Caverns conducted a survey of their own to learn more about the source of park visitors. Their survey consisted of an inventory of cars by state of registration during one peak hour of the day. A time span of seven consecutive weeks was covered, and 3,142 observations were made. Beginning with Sunday, July 7, and progressing through Saturday, August 24, one day per week was sampled. Their officially sponsored survey produced results similar to the survey included in this thesis: (1) twenty-one states were represented by 1.0 or more percent of the sample; (2) although some difference in ranking among these states was noted, only two dropped below the 1.0 percent level; (3) the top five states, which were the same in both surveys, accounted for some sixty percent of the total sample. (Appendix II contains the complete tabulation.)

General Visitor Characteristics

It would be appropriate at this juncture to examine some of the data of a general nature which is presented in Table 6. Carlsbad Caverns visitors were gone from their homes an estimated average of 13.6 days. The highest value for this question was given by a couple from Canada who were on an extended, two-year excursion; the lowest value given was zero. (This latter contingency may be explained by the fact that any fraction having a value of less than one-half was considered to be zero.) A few residents of Carlsbad, New Mexico, spent only a portion of a day on their trip to the park. Similarly, total trip expenditures per party ranged from a low of zero and a high of $5,000.00, with the estimated mean expenditure being $301.17 for each party. Carlsbad Caverns visitors tended to be family travelers, and the estimated average number per party was 4.1 persons. When results of this portion of the survey are compared to other surveys made on a national basis, some interesting relationships are discovered.

The American Automobile Association (AAA) has conducted two polls to determine travel habits of their members, the first in 1963 and the second in 1966.[72] The AAA is broadly based, as it represents over ten percent of the total households in the United States. Additionally, members of AAA are generally both widely traveled and more affluent than average Americans. Thus they are also representative of that

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[72] American Automobile Association, And Away We Go! (Washington, D.C.: American Automobile Association, 1967), pp. 1-11.

TABLE 6

SOME GENERAL CHARACTERISTICS OF CARLSBAD CAVERNS VISITORS[a]

	Mean	Standard Deviation	Minimum	Maximum	Range
Persons in Party	4.1	1.9951	1.0	17	16
Days of Entire Trip	13.6	27.8205	0.0	730	730
Expenditure per Party on Entire Trip (in dollars	301.17	403.8455	0.0	5000	5000
Days in Caverns General Vicinity	1.7	1.2752	0.0	14	14
Expenditure per Day per Party in General Vicinity of Caverns (in dollars	29.70	23.9568	0.0	180	180

[a]Source: Survey data. For these calculations, n=801.

sector of American society which the Outdoor Recreation Resources Review Commission (ORRRC) found was most likely to indulge in outdoor recreation activities.[73] AAA members' vacation trips had a mean length of 10 days per trip in 1963 against a mean length of 11.5 days in 1966, indicating an upward trend in trip duration. In the Carlsbad Caverns visitor survey the estimated mean trip length of 13.6 days was approximately two days

[73]Outdoor Recreation Resources Review Commission, Report of the Commission, National Recreation Survey, ORRRC Study Report 19 (Washington, D.C.: Government Printing Office, 1962), pp. 62-70.

longer than in the second AAA survey. Nonetheless, this is consonant with the trend noted by AAA. The mean number of members per party in the Carlsbad Caverns survey was 4.1, being somewhat larger than the average of three persons per party traveling in the United States, Canada, and Mexico for both surveys conducted by the AAA. Of course, the AAA survey covered a whole year while the Carlsbad Caverns survey was conducted only in the summer when children would normally not be attending school. This explains, no doubt, at least a portion of the increased party size reflected in the current survey.

Visitor Expenditures in Caverns Vicinity

Total visitor expenditure in the area is dependent upon three variables: number of visitors, mean daily expenditures, and mean days in the general vicinity. Survey respondents and their families or their companions spent $29.70 each day they remained in the general vicinity of the Caverns. This amounted to an average per capita expenditure of $7.24 (see Table 6). On the average, visitors also remained in the general vicinity 1.67 days. Thus during the week this poll was taken, Carlsbad Caverns visitors spent some $475,000. This estimate was derived by multiplying estimated average daily per capita expenditure by the total visitation for the seven days for which the survey was conducted by the estimated average number of days spent in the Caverns' general vicinity. (For the purposes of this survey it was determined that a more accurate estimate of expenditures could be obtained on a total per day basis, rather than requesting costs for specific items such as food, lodging, and transportation.)

As it appeared on the questionnaire, "general vicinity" was defined roughly as an area lying within a seventy-five-mile radius of the park's entrance. Specifically within this circle were included "places in New Mexico such as Artesia, Carlsbad, Whites City; and also Van Horn and Pecos, Texas" (see Appendix I). These communities have the maximum likelihood of receiving direct economic benefit from Carlsbad Caverns because of their proximity to the park.

Night Before and Night After Stops

A circular zone of economic influence provides a partial picture of Carlsbad Caverns' geographic area of benefit. Visitors do not cease to spend money as they travel beyond the limits of the seventy-five-mile radius of the park's general vicinity. Their presence and passage is felt in the outlying territory as well.

It has already been noted that adjacent parts of Texas and New Mexico are sparsely populated. Towns and communities are small in number and often small in size. A limited number of highways into and through the region restricts traffic flow to a relatively few main highways. Also along these well-used routes are located hotels, motels, restaurants, and other services that travelers patronize.

Table 7 has been prepared to illustrate a two-day traffic pattern in terms of stopping places used by park visitors the "night before" and the "night after" their visit to the Caverns. Information in this table shows that 84.4 percent of night before stops and 68.9 percent of the expected night after stops were located 400 miles or less from the park's entrance.

TABLE 7

MAJOR STOPPING PLACES OF CARLSBAD CAVERNS
VISITORS LESS THAN 400 MILES
FROM THE PARK

Town	Night Before		Night After	
	Frequency	Percentage	Frequency	Percentage
Under 100 miles				
Artesia	13	1.6	6	0.7
Carlsbad	144	18.0	80	10.0
Cloudcroft	6	0.7	9	1.1
Hobbs	14	1.7	12	1.5
Roswell	29	3.6	13	1.6
Whites City	89	11.1	24	3.0
N.M., less than 1%	6	0.7	5	0.6
Pecos	15	1.9	10	1.2
Texas, less than 1%	6	0.7	5	0.6
Sub Total[a]	322	40.2	164	20.5
100-200 miles				
Alamogordo	21	2.6	18	2.2
Clovis	9	1.1	7	0.9
Las Cruces	10	1.2	8	1.0
Ruidosa	6	0.7	11	1.4
N.M., less than 1%	18	2.2	9	1.1
Big Spring	10	1.2	3	0.4
El Paso	82	10.2	91	11.3
Ft. Stockton	13	1.6	7	0.9
Lubbock	11	1.4	13	1.6
Midland	9	1.1	9	1.1
Texas, less than 1%	31	3.9	31	3.9
Sub Total[a]	220	27.5	207	25.8
201-300 miles				
Albuquerque	12	1.5	18	2.2
Santa Fe	5	0.6	14	1.7
N.M., less than 1%	18	2.2	17	2.1
Abilene	14	1.7	11	1.4
Del Rio	9	1.1	5	0.6
Texas, less than 1%	24	3.0	29	3.6
Sub Total[a]	82	10.2	94	11.7

Town	Night Before		Night After	
	Frequency	Percentage	Frequency	Percentage
301-400 miles				
N.M., less than 1%	7	0.9	14	1.7
Dallas	4	0.5	15	1.9
Ft. Worth	4	0.5	9	1.1
San Antonio	11	1.2	29	3.6
Texas, less than 1%	26	3.2	20	2.5
Sub Total[a]	52	6.5	87	10.9
Over 401 miles, Other States, Miscellaneous				
Texas (over 401 mi. and Indefinite)	1	0.1	27	3.4
Arizona	15	1.9	37	4.6
Oklahoma	3	0.4	11	1.4
Other States	10	1.2	15	1.9
Home	74	9.2	78	9.7
No Response	22	2.7	81	10.1
Sub Total[a]	125	15.6	249	31.1
Grand Total	801	100.0	801	100.0

[a]Source: Survey data. Due to rounding off to one decimal place, percent figures in sub total rows may not be correct when added within each classification. Each sub total percentage was recalculated and this more accurate figure listed.

Of the two categories more credence must be assigned to "night before" data. Stopping places used the night before visiting the Caverns were reported from actual knowledge, while the next night's stopping place could only be estimated.

Although some hardy individuals do not conform to the general tendency, most visitors must necessarily spend at least one night near the park due to the number of hours it takes to tour the caverns.

Table 7 shows that the three places which were most used by Carlsbad Caverns visitors were Carlsbad and Whites City, New Mexico, and El Paso, Texas. Information used in preparing this table indicated that a large number of early morning visitors had spent the previous night at Carlsbad or Whites City. Many late afternoon visitors also hoped to secure overnight lodging in one of these New Mexico stopping places. In questionnaires from middle of the day tours, El Paso predominated in both night before and night after categories.

Questions which covered the above points were apparently misunderstood by some respondents. It was noted that many late afternoon visitors indicated night before stops which were several hundred miles away. These persons may have interpreted "the Caverns" as including the community of Carlsbad. Their line of reasoning on the question may have been, "Tonight we will stay at Carlsbad, and tomorrow night <u>after we leave the Caverns</u> we will stay in San Antonio." Then, in answering the question they would specify San Antonio (or some other distant destination) as their next stop. If this were the case, visitors actually used accomodations adjacent to the national park in larger proportions than data in Table 7 implies.

One striking feature of questionnaire response is the high percentage of no responses in the night after category. Only 2.7 percent of the parties failed to respond to the question concerning their previous night's stopping place, but 10.1 percent deigned no reply to the same question relative to their next overnight stop. At least a part of this variation might be explained by the respondents' having a flexible trip itinerary.

San Antonio was frequently chosen by Carlsbad Caverns visitors as a potential destination. This may have been due to the additional attraction provided by Hemisfair during the summer of 1968. However, San Antonio's 3.6 percent as an anticipated stop was not exorbitantly larger than that of either Dallas or Fort Worth, which are about the same distance from the Caverns. Of course, the sample size was not large enough to give reliable inferences on such a small point.

A map examination of night before and night after stopping places would reveal a funneling of traffic through El Paso. This lends substance to West Texas' claim of being astride a significant east-west travel route.

Accommodations

A large quantity of overnight accommodations in the form of camp sites, hotel rooms, motel rooms, and trailer courts are needed to provide for Carlsbad Caverns visitors. With a growing visitation rate at the Caverns and an expected influx of visitors to Guadalupe Mountains National Park when it is opened, additional facilities of many types will be needed.

Table 8 presents an overall view of accommodation preferences of Carlsbad Caverns visitors. As was expected motels represented an overwhelming first choice, comprising almost 56 percent of the sample. Hotels fared poorly as only 2.6 percent of respondents used that conventional facility. The most interesting results were noted with regards to camping. Campers were the most disgruntled and dissatisfied group. In recent years there has been a strong trend toward families

TABLE 8

ACCOMMODATIONS USED NIGHT BEFORE PARK VISIT[a]

Type	Total Number of Parties	Percentage
Motel	447	55.8
Friends or Relatives	127	15.9
Camping	88	11.0
Home	69	8.6
Hotel	17	2.1
House Trailer	16	2.0
Other	8	1.0
No Response	29	3.6
Total	801	100.0

[a]Source: Survey data.

buying or renting pickup campers. At present this demand for camping is substantial and appears to be unfulfilled in the general vicinity of Carlsbad Caverns. Within the national park boundaries, there are no camping facilities available. One rather unattractive privately operated campground having eighty trailer sites and 130 tent sites is located at Whites City. A few other campground facilities are available in the city of Carlsbad. All are heavily used. However, these cannot meet the demand for camp sites, and many campers are forced to spend the night in a motel. This question on the survey was open-ended, and the response "We stayed at a motel but would have camped out if facilities had been provided." was frequently listed. It can be safely assumed that the number of campers, which ranked third, probably would have been much higher.

A sizeable number of visitors indicated that they had spent the previous night in their own home. This data corroborates the earlier conclusion that a large portion of Carlsbad Caverns visitors come from New Mexico and nearby states.

Primary Purpose for Trip

Visitors to Carlsbad Caverns fit into two general categories regarding their ultimate destination. First, there are those whose specific trip purpose was to view the caverns; therefore, Carlsbad Caverns was their primary destination. Over 21 percent of visitors who were surveyed gave the Caverns as the single goal of their trip (see Table 9). This is a measure of the drawing power and favorable reputation which this national park enjoys. Secondly, there are

TABLE 9

PRIMARY PURPOSE FOR TRIP[a]

Purpose	Total Number of Parties	Percentage
Carlsbad Caverns as One Attraction Among Several on a Tour	618	77.2
Carlsbad Caverns as the Single Purpose of Trip	173	21.6
No Response	10	1.2
Total	801	100.0

[a]Source: Survey data.

those whose visit to the Caverns was not the main reason for their trip. They stopped by the Caverns en route to another objective. Some 77 percent of the visitations fell into this latter category.

In theoretical economic application, the total expenditure of those parties who listed the Caverns as their singular trip purpose would be attributable to the presence of the park. Such a strict interpretation could not take into account any cost incurred for purposes not directly related to the stated trip goal. Nonetheless, a substantial part of their total expenditures could rightfully be claimed by Carlsbad Caverns National Park.

Knowledge of Guadalupe Mountains National Park

People must first know about a park facility and second they must hold a favorable impression or pleasant mental image of the facility before they will visit it. One section of the questionnaire was designed to provide such information on newly authorized Guadalupe Mountains National Park.

Table 10 shows the proportion of Carlsbad Caverns visitors who had some knowledge of Guadalupe Mountains National Park at the time the survey was conducted. A much higher percentage of respondents (78.6 percent versus 18.0 percent) knew nothing of the Guadalupe park site. This result was expected since no publicity campaign or promotion of the national park-to-be had been launched. Certainly much work remains to be done to acquaint the general public with this future recreational asset.

A public orientation must precede or accompany the actual opening

TABLE 10

PARTIES HAVING KNOWLEDGE OF GUADALUPE MOUNTAINS NATIONAL PARK[a]

Response	Total Number of Parties	Percentage
Yes	144	18.0
No	629	78.6
No Response	28	3.4
Total	801	100.0

[a]Source: Survey data.

of Guadalupe if the park is to get off to a good start. But where should such a promotional campaign concentrate its efforts? One question on the survey was included to determine how those who already knew of Guadalupe Mountains National Park had obtained their information. Percentages attributed to various media are listed in Table 11. Road maps and tourguides are obviously the prevalent source of knowledge. (At the time the survey was conducted, some road maps provided by the major oil companies clearly indicated Guadalupe on them. Others did not. A similar situation also existed with tourguides.) This would imply that many travelers were not aware that a Guadalupe Mountains National Park had been authorized until they had begun their trip. They very likely may have been approaching Carlsbad Caverns before noticing the indication of a neighboring national park. The so-called "mass" media--radio, television, newspapers, and magazines--accounted for a

TABLE 11

MEDIA THROUGH WHICH PARTIES GAINED KNOWLEDGE OF GUADALUPE MOUNTAINS NATIONAL PARK[a]

Media	Total Number of Parties	Percentage
Road Map or Tourguide	63	43.8
Word of Mouth	29	20.1
Newspaper or Magazine Article	23	16.0
Radio or Television	11	7.6
Other	18	12.5
Total	144	100.0

[a]Source: Survey data. Total number of parties in this tabulation consisted of all surveyed parties who indicated that they had some knowledge of the authorization of Guadalupe Mountains National Park. Thus, n=144.

combined total of 23.6 percent of those having knowledge of Guadalupe. Word of mouth accounted for 20.1 percent. Ten parties indicated two or more media as the source of their information. These were included in the "other" category, which accounts for much of its size.

A final question concerning Guadalupe Mountains National Park provided Carlsbad Caverns visitors a range from complete indifference to clear and definite interest so as to measure their prevalent feelings toward Guadalupe (see Table 12). Caution must be taken not to attach too much importance to such a tabulation. Many persons tend to reply in a specious manner. They answer as they think the interviewer would want them to respond. Probably the most accuracy can be assigned

TABLE 12

CARLSBAD CAVERNS VISITOR INTEREST IN GUADALUPE MOUNTAINS NATIONAL PARK[a]

Degree of Interest	Total Number of Parties	Percentage
No Interest in Learning of Guadalupe	33	4.1
Some Interest in Guadalupe	288	36.0
Would Visit Sometime in the Future	167	20.9
Would Visit on Current Trip if It Were Already Developed and Open	157	19.6
No Response	156	19.4
Total	801	100.0

[a]Source: Survey data.

to those who indicated disinterest. A distinction then can be made between some measure of interest and a lack of interest. Thus, a total of 76.5 percent of respondents held a favorable impression of Guadalupe, while 4.1 percent registered indifference.

Many respondents who learned of Guadalupe's authorization only as they read the questionnaire understandably offered no response to this question. As a result, the percentage in this last category was unusually large, with almost one-fifth of all respondents expressing no opinion.

Recreation Preferences

Table 13 yields probably the most worthwhile and valuable information of the entire survey. It provides a listing of recreation preferences of Carlsbad Caverns visitors. Furthermore, it is anticipated that future users of Guadalupe Mountains National Park will exhibit many, if not most, of these same preferences.

So that an accurate picture of recreational desires might be formulated, the whole spectrum of these activities was represented. In this way biases due to questionnaire design hopefully were avoided.

Outdoor recreation activities used by the Outdoor Recreation Resources Review Commission were the basis for enumerating choices on this question of the survey. Some modification, specifically arranging as groups, was done for brevity's sake.

It was the simple pleasures which were most popular among Carlsbad Caverns visitors. Sightseeing was the foremost selection. Swimming was the second most popular activity, followed closely by camping. Fishing and driving for pleasure were also frequently chosen. The remaining activities received scattered and limited response.

The visitors' preference for sightseeing above all other choices is not startling, as that would be their main activity at Carlsbad Caverns. Swimming is a more peculiar choice. It is certainly an outdoor recreation activity, but this demand is usually met by either private enterprise or agencies other than the National Park Service. Within the Carlsbad Caverns-Guadalupe Mountains area a visitor's appetite for swimming is largely satisfied by motels, as proprietors cater to the desires of their guests. Fishing is a sport that has

TABLE 13

OUTDOOR RECREATION INTERESTS[a]

Activity	Frequency	Percentage
Sightseeing	400	16.7
Swimming	275	11.5
Camping	255	10.6
Fishing	218	9.1
Driving for pleasure	162	6.7
Picnics	106	4.4
Horseback riding	105	4.4
Attending outdoor sports events	97	4.1
Hunting	85	3.5
Water skiing	68	2.8
Nature walks (to observe birds, animals, plants, etc.)	64	2.7
Walking for pleasure	54	2.3
Playing outdoor games or sports	49	2.0
Canoeing, sailing, or boating	39	1.6
Winter sports (snow skiing, skating, sledding, etc.)	36	1.5
Attending outdoor concerts, drama, etc.	29	1.2
Hiking (on trails with pack)	27	1.1
Bicycling	20	.8
Mountain climbing with gear	10	.4
Others	27	1.1
No response	277	11.5
Total	2403	100.0

[a]Source: Survey data. Since each respondent made three choices on this question, for this tabulation n=2403.

limited potential in this immediate geographical location. There is little hope of this situation changing. Lack of facilities for campers has already been mentioned as a prime annoyance among Carlsbad Caverns visitors. This is a need which can, and should, receive a response from both the federal and private sectors.

CHAPTER V

SUMMARY AND CONCLUSIONS

Contents of this final chapter have been divided into three sections: park users, today and tomorrow; a regional view of recreational travel; and the qualities and opportunities provided by Guadalupe Mountains National Park.

Park Users, Today and Tomorrow

Tourism is a burgeoning element on the American scene. Yet in many locations throughout the nation very little is known of visitor interests and visitor behavior. Many who depend heavily on this activity as a source of income operate under little more than premonitions, hopes, or at best calculated guesses.

To provide basic information to shorten the gap between policy and decision was the intent of the survey made as a part of this study. Such information could be beneficial in several ways. It could be employed not only in designing interpretive, service, and comfort facilities for Guadalupe; but also it could be an additional consideration for making decisions in the expenditure of public and private funds for promotional purposes. Additionally, it yields some benchmark data for market analyses and for investment criteria.

A review of survey data reveals the main aspects of Carlsbad

Caverns National Park visitation. That the size of the sample was small, that the time span was brief, that completely random selection was impractical, must be admitted. In the absence of a more comprehensive analysis, however, the following characteristics of 801 parties surveyed during one week of peak summer activity provide the best and most current estimates of Carlsbad Caverns visitation.

1. Almost one-third of the parties were from Texas. Heavily populated California supplied 13.9 percent of park visitors, and the Caverns' home state, New Mexico, was the source of 5.7 percent of the visitors. Next in order came the neighboring states of Oklahoma, Louisiana, and Colorado.

2. Forty-five states were represented in the sample. There were six parties from foreign countries. Although the bulk of park users come from nearby states, this national and international drawing power (coupled with a non-existence of criteria for "regional" parks) shows Carlsbad Caverns to be truly a "national" park.

3. The average party size of survey respondents was 4.1 persons.

4. Regarding his entire trip, it is estimated that the average Caverns visitor spends $301.17 and is gone from home 13.6 days.

5. Within the general vicinity of Carlsbad Caverns (an area extending some seventy-five miles from the park's entrance) it is estimated that the average party stays 1.7 days and spends $29.70 per day during peak summer months.

6. Three places--Carlsbad, Whites City, and El Paso--are the most important providers of overnight accommodations for Carlsbad

Caverns visitors, as 39.3 percent of those parties surveyed stayed at one of these locales. Situated within a 400-mile radius of the Caverns are 84.4 percent of all overnight stopping places used by respondents the night before entering the park.

7. Visitor preference for motels over other types of accommodations was high. Fifty-six percent of parties polled reported staying at motels their last night en route to the Caverns. Campers constituted a sizeable and disenchanted segment of the sample. Eleven percent had camped out the night before, but others who had stayed at motels commented that they would have camped had facilities been available.

8. Those who listed Carlsbad Caverns as the single destination of their trip accounted for 21 percent of the total. Seventy-seven percent specified the Caverns as one attraction among several on their trip.

9. At the time the survey was taken only 18 percent of Caverns visitors knew of the authorization of Guadalupe Mountains National Park.

10. Of those who had some knowledge of Guadalupe, 43 percent learned of its existence from road maps or tourguides, 20 percent by word of mouth, 16 percent through newspapers or magazines, and 7 percent from radio or television.

11. Only 4.1 percent of survey respondents indicated no interest in Guadalupe Mountains National Park.

12. Among outdoor recreation activities which were most favored by Carlsbad Caverns visitors, sightseeing placed first with 16.7

percent; swimming was second with 11.5 percent; and camping came next with 10.7 percent. After these in the order of their preference were fishing, driving for pleasure, picnicking, and horseback riding.

Any visitor to Carlsbad Caverns is not an apathetic traveler who just "happened to drop by." He is a tourist, a vacationer, or a recreationist, and in being such he must have some appetite and empathy for outdoor recreation. His desire for sightseeing probably will not be entirely satiated by his visit at the Caverns, and he might be enticed to stop over at Guadalupe through the operation of a "threshold" concept. In its application here, "threshold" would be defined as that point at which a person will make the decision to visit a recreation resource or to participate in the activities offered by a recreational facility. A few comments might help to explain this concept.

Some people would have absolutely no interest in visiting Guadalupe Mountains National Park, even if they lived adjacent to it. Others would drive thousands of miles for the specific purpose of seeing Guadalupe's special attractions. Between these two extremes is a range of persons who will visit the park, depending on their interest and the distance, expense, or inconvenience involved. In the future many people will visit Guadalupe Mountains National Park because it is easily accessible from Carlsbad Caverns. In driving from El Paso to Carlsbad and points beyond, travelers must pass by the proposed main entrance to Guadalupe Mountains National Park. Just as there are impulse buyers, so there are impulse recreators whose

threshold point is low, allowing them to visit Guadalupe "because it was there and so were they." The application of this theory should be very favorable in influencing visitation rates, especially during the early stages of Guadalupe's development.

A Regional View of Tourism

Few matters having to do with tourism have received so much attention as the prosperity an area may realize from visitor expenditures. The inflow of tourist dollars into a region has become an issue of paramount importance. Tourism in some regions of the United States is no longer considered to be only a seasonal trade; in fact, tourists are vigorously courted throughout the year by civic leaders who realize that money left by recreation seekers vitally affects their local economic structure. Not only those people who cater to the tourist market but each and every citizen of the community stands to benefit, because this new revenue can be transformed into roads, schools, and other civic improvements.

No community has been more active in the development and promotion of their recreation potential than has Carlsbad, New Mexico. The Carlsbad Chamber of Commerce was instrumental in the creation and heralding of the Caverns in the 1930's. Thirty years later this same organization petitioned Congress, earnestly favoring the authorization of Guadalupe Mountains National Park. An examination of historical records would indicate that their enthusiasm for tourism is warranted, for their earlier efforts returned handsome dividends.

A similar dependency on tourism as an economic mainstay is evident

across the state line in Trans-Pecos Texas. There, small communities such as Van Horn, Marfa, Fort Davis, and Alpine are almost totally reliant on a dwindling pastureland economy and tourist activity around existing recreation attractions for their state of prosperity.

New opportunities will be added to this region by the development of Guadalupe Mountains National Park. After the park becomes a functioning reality, efforts can be directed at retaining travelers who would be visiting the region anyway. In this manner the amount of effort needed to inform visitors of the existence of Guadalupe will be greatly reduced. Proper promotion will increase the drawing power of Guadalupe. It should be presented as one highlight of a trip to a rich and varied area. When this is done, the presence of Guadalupe Mountains National Park will make a healthy situation even more sanguine.

So long as certain social phenomena--an upsweep in population, a continuing family mobility, a continuing level of disposable income, and the associated desires of more and more people to travel--remain constant, a lively economic insurgence should accompany the opening of Guadalupe Mountains National Park.

Information supplied by the survey indicates a wide geographic distribution of Carlsbad Caverns visitors. As the distance from point of origin to the Caverns varies, so do the amounts of time and money these visitors must spend in order to accomplish their travel objectives. Those who listed the Caverns as only one item on their trip itinerary left substantial evidence of their passage through the Caverns' general vicinity. Others were headed straight for Carlsbad

Caverns, with that facility being the primary destination of their trip. In this latter case Carlsbad Caverns can claim to be responsible for the total trip expenditure--much of which may have been left outside the Caverns' normal area of influence. Guadalupe's area of influence should be approximately the same in both instances. Therefore, increased revenues should inure to the residents of the region (and some points beyond) from the addition of the new park facility.

Guadalupe Mountains National Park: Its Qualities and Its Opportunities

Recreational facilities are developed for people. Any plan of development for Guadalupe must reflect, so nearly as is possible, the wants and needs of its prospective users. The characteristics and projected number of users must be incorporated into planning procedures and must form an integral part of eventual plans. Then, these considerations find their final form in potentials and limitations embodied by the site itself.

Some structures and facilities are standard to all national parks, and they must necessarily be provided. Visitor centers and accommodations for park rangers are two examples, but their location is also dependent on physical and topographic features.

The proposed site has certain obvious assets, as well as some natural limitations. For example, McKittrick Canyon offers spectacular scenery, but it exists in a delicate ecological balance. This must be preserved as nearly as possible in its present condition so future

students in botany, zoology, limnology, and geology might have access to it. The fragility of this special canyon must be fiercely safeguarded; therefore, casual visitation must be limited or restricted. Ample open space of less scientific value, but scarcely less scenic worth, are available elsewhere within the park.

Being so isolated and so unlike the vast majority of Texas, few people realize the magnificent scenery that the Guadalupes possess. Vegetation, ranging from desert-like to alpine, coupled with rugged mountain and canyon topography provides great scenic interest for viewers. Vegetation furnishes cool, comfortable surroundings for visitors who enjoy leisurely pursuits in scenic spots. Natural beauty is one prime commendation of this spot. Scenic drives, overlooks, camping sites, and picnic facilities should be located so as to take advantage of this natural charm.

An abundant wildlife culture gives pleasure to people in many ways. Some like to photograph wild animals, while others are content just to spot them in their native habitat. Hunting and fishing enthusiasts will have to rely on Lincoln National Forest to fulfill their desires.

Due to the mild winters, balmy spring and fall seasons, coupled with the region's pure air and natural beauty, Guadalupe Mountains National Park and its neighboring recreation attractions should become more and more attractive to year-round visitation.

In the development of Guadalupe, provision of those facilities which visitors to Carlsbad Caverns specified as being most preferred--sightseeing, driving for pleasure, picnicking, and most importantly

camping--should have first priority. Other recreation activities such as horseback riding, nature walks, walking for pleasure, hiking, and mountain climbing with gear should be provided for as soon as time and resources allow. A most entertaining proposal, the loop road connecting Guadalupe with Lincoln National Forest and Carlsbad Caverns, should be immediately exploited.

Much geology of the Delaware Basin and the Capitan Reef has been described at Carlsbad Caverns. Guadalupe can complete the story by offering a view of this reef in cross section, perhaps at the mouth of McKittrick Canyon. Of course, El Capitan, the feature for which the reef was named, provides a dramatic geological statement in itself.

A well-done archeological center would provide a rich and deeply-rooted first chapter in the ecology of man in this region. Finds and artifacts from Lincoln National Forest and remote areas of Carlsbad Caverns National Park might be collected for display at an appropriate spot in Guadalupe.

The Guadalupe Mountains have been in the center of history, their location and environment causing events to swirl around them and allowing them, at the same time, to remain almost completely unchanged. This pleasant situation should be gently featured. There are locations in the park which are well adapted for historical interpretation. For instance, Guadalupe Pass, the constriction which forced strange and often alien people to travel along the same trail for a short distance, evoked comments and impressions from characters of many sorts. Also within Guadalupe Pass, the remnants of Pine Spring Station are standing and offer an interesting backdrop for relating the epoch of the Butter-

field Overland Stage. Historical interpretation at Guadalupe should be linked to the occurrences presented at Fort Davis National Historic Site and Big Bend National Park. Emphasis could be placed on the stagecoach: how the route was chosen, why it failed, and why it was re-routed. The relationship between Pine Spring and the next westward staging station at Hueco Tanks should be established, especially since many Guadalupe visitors would be heading in that direction. Other historical episodes should be depicted. Included could be Spanish exploration, Indian depredations, cavalry expeditions, gold seeker migrations, border disputes, and other events of our westward expanding nation.

A Challenge

In his quest for knowledge the scientist goes to the natural laboratory provided by the outdoors in order to study, probe, and observe the lessons which can be gleaned from nature's textbook. The scientist is a purist who espouses the preservation of unique scientific values. On the other hand, the recreationist is utilitarian, as he looks at the natural landscape with an eye more toward the enjoyment he can derive from it. At some juncture preservation and enjoyment are bound to come into conflict.

The challenge of development of Guadalupe Mountains National Park is to achieve a satisfactory balance between a total usage which would irreparably damage a pristine landscape and a complete preservation which allows only limited appreciation. Final plans should call for emphasis on uniqueness without ruination.

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APPENDIX I

QUESTIONNAIRE

Mind if we ask you a few questions
about your trip to

Carlsbad Caverns National Park?

DEPARTMENT OF PARK ADMINISTRATION
TEXAS TECHNOLOGICAL COLLEGE

Please turn to inside of cover.

VISITOR SURVEY

Please fill in the blanks with the information requested or check the appropriate answer.

Please Do Not Use

A. Residence:

City or town _____ State _____ ☐☐

B. Is your visit to Carlsbad Caverns

_____ 1. one attraction among several on a tour, or ☐

_____ 2. the single purpose of your trip?

C. How many persons are in your party? _____ ☐☐
(Don't forget children and babies.)

D. For the ENTIRE TRIP, please estimate:

a. How many days will you be gone from home? _____ ☐☐☐

b. How much will you spend on entire trip? _____ ☐☐☐☐

E. Where was your last overnight stopping place before arriving at the Caverns?

a. Town _____ State _____ ☐☐☐☐

b. What type of accommodations did you use?

1. Hotel_____ 2. Motel_____ 3. Friends or relatives_____ ☐

4. Camping_____ 5. House trailer_____ 6. Home_____

7. Other (specify) _____

F. How many days will you spend in the GENERAL VICINITY of the Caverns? (Within this "general vicinity" would be places in New Mexico such as Artesia, Carlsbad, Whites City; and also Van Horn and Pecos, Texas.)

_____ Days ☐☐

G. Please estimate the total amount you and the members of your party spend EACH DAY in this GENERAL VICINITY. (Include such items as food, lodging, transportation costs, souvenirs, entrance fees, etc. Don't forget Credit Card purchases.)

$_____ to nearest dollar ☐☐☐

H. Where do you plan to make your next overnight stopping place after leaving the Caverns?

Town _____ State _____

I. Check the THREE outdoor recreational activities that appeal most to your family or group.

_____1. Camping
_____2. Fishing
_____3. Hunting
_____4. Bicycling
_____5. Horseback riding
_____6. Driving for pleasure
_____7. Sightseeing
_____8. Swimming
_____9. Water skiing
_____10. Winter sports (Snow skiing, skating, sledding, etc.)
_____11. Playing outdoor games or sports
_____12. Mountain climbing with gear
_____13. Hiking (on trails with pack)
_____14. Nature walks (to observe birds, animals, plants, etc.)
_____15. Picnics
_____16. Walking for pleasure
_____17. Canoeing, sailing, or boating.
_____18. Attending outdoor sports events
_____19. Attending outdoor concerts, drama, etc.
_____20. Others (please specify)_____

_____

J. Do you know of the newly authorized Guadalupe Mountains National Park which is about 20 miles from the Caverns?

No _____

Yes_____ If your answer is yes, please indicate how you learned about this new National Park.

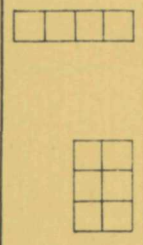
_____ 1. Newspaper or magazine article
_____ 2. Radio or TV
_____ 3. Word of mouth
_____ 4. Roadmap or tourguide
_____ 5. Other _____

K. Which one of the following statements most closely represents your view about Guadalupe National Park.

_____ 1. I am not interested in learning more about it.
_____ 2. I am interested in learning more about the Park and would consider visiting there sometime in the near future.
_____ 3. I would definitely like to visit it sometime in the future.
_____ 4. I would visit the Park on this trip if it were already developed and open.

THAT'S ALL, THANKS !

Please Do Not Use



APPENDIX II

SOURCE OF VEHICLES*

State or Country	Total Number of Parties	Percentage
Texas	965	30.8
California	433	13.8
New Mexico	294	9.3
Oklahoma	161	5.1
Louisiana	98	3.1
Ohio	94	3.0
Illinois	90	2.9
Kansas	75	2.4
Colorado	71	2.3
Arizona	64	2.0
Florida	63	2.0
Pennsylvania	58	1.8
Mississippi	46	1.5
Missouri	44	1.4
Michigan	41	1.3
Iowa	39	1.2
New York	39	1.2
Indiana	38	1.2
Georgia	38	1.2
Arkansas	37	1.2
Tennessee	33	1.1
Nebraska	28	.9
Alabama	25	.8
New Jersey	23	.7
Wisconsin	22	.7
Oregon	20	.6
North Carolina	19	.6
Utah	16	.5
Minnesota	15	.5
South Carolina	15	.5
Connecticut	14	.4
Washington	14	.4
Maryland	13	.4
Massachusetts	12	.4
Nevada	10	.3
Virginia	10	.3
Wyoming	8	.3
West Virginia	7	.2
Montana	6	.2

State or Country	Total Number of Parties	Percentage
Kentucky	4	.1
New Hampshire	4	.1
Delaware	3	.1
Idaho	3	.1
Alaska	2	.1
North Dakota	2	.1
Rhode Island	2	.1
Maine	1	.0
South Dakota	1	.0
Hawaii	0	.0
Vermont	0	.0
Canada	14	.4
Mexico	2	.1
Other Foreign	6	.2
Total	3142	100.0

*Compiled by Carlsbad Caverns Staff from data collected during the period July 7 through August 24, 1968. A different day of the week was sampled from each of the seven consecutive weeks. The inventory was taken by state of registration of automobiles left in public parking areas at the Caverns during one peak hour of the day.

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Research Report No. 1
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