WORLD HERITAGE NOMINATION - IUCN SUMMARY

CARLSBAD CAVERNS NATIONAL PARK (USA)

Summary prepared by IUCN/WCMC (March 1995) based on the original nomination supplied by the United States Department of the Interior, National Park Service. This original and all documents in support of this nomination will be available for consultation at the meetings of the Bureau and the Committee.

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1. LOCATION

Lies at the foothills of the Guadalupe Mountains, in southwestern Eddy county, New Mexico.

2. JURIDICAL DATA

Carlsbad Caverns was first designated as a national monument in 1923 and redesignated a national park in 1930. Approximately two thirds of the area were also gazetted as wilderness in 1978.

3. IDENTIFICATION

The park covers an area of 18,926ha and overlies a segment of the Permian fossil Capitan Reef. An extensive cave system has developed within the reef as a result of sulphuric acid dissolution and of the 81 known caves, Carlsbad Cavern is the largest. Exploration of the Lechuguilla Cave has been undertaken only over the past decade and has shown it to be one of the most pristine, extensive and decorated caves in the world.

Vegetation communities range from desert to coniferous forest. Some 800 plant species have been identified, of which three are internationally threatened: Sneed pincushion cactus, Lee pincushion cactus and Lloyd's hedgehog cactus. The faunal inventory includes 64 mammals, 331 bird and 44 herpetofauna species. The caves are noted for their migratory bat species, especially the Mexican free-tailed bat whose population is estimated at one million individuals. Various species of fungi and bacteria growing in the caves are of particular scientific and medical interest.

4. STATE OF PRESERVATION/CONSERVATION

Disturbances within the park include permanent damage incurred to speleothems and the cave ecosystem from tourism, decline in bat populations from the use of DDT as well as attempts to eradicate them in Mexico, oil and gas exploration, grazing by trespassing livestock, invasion by exotic fauna and the hunting of puma.

The National Park Service employs 85 permanent and 40 temporary staff and an updated management plan is due to be completed later this year. Separate plans have been prepared for visitor use and research of specific caves, particularly Lechuguilla.

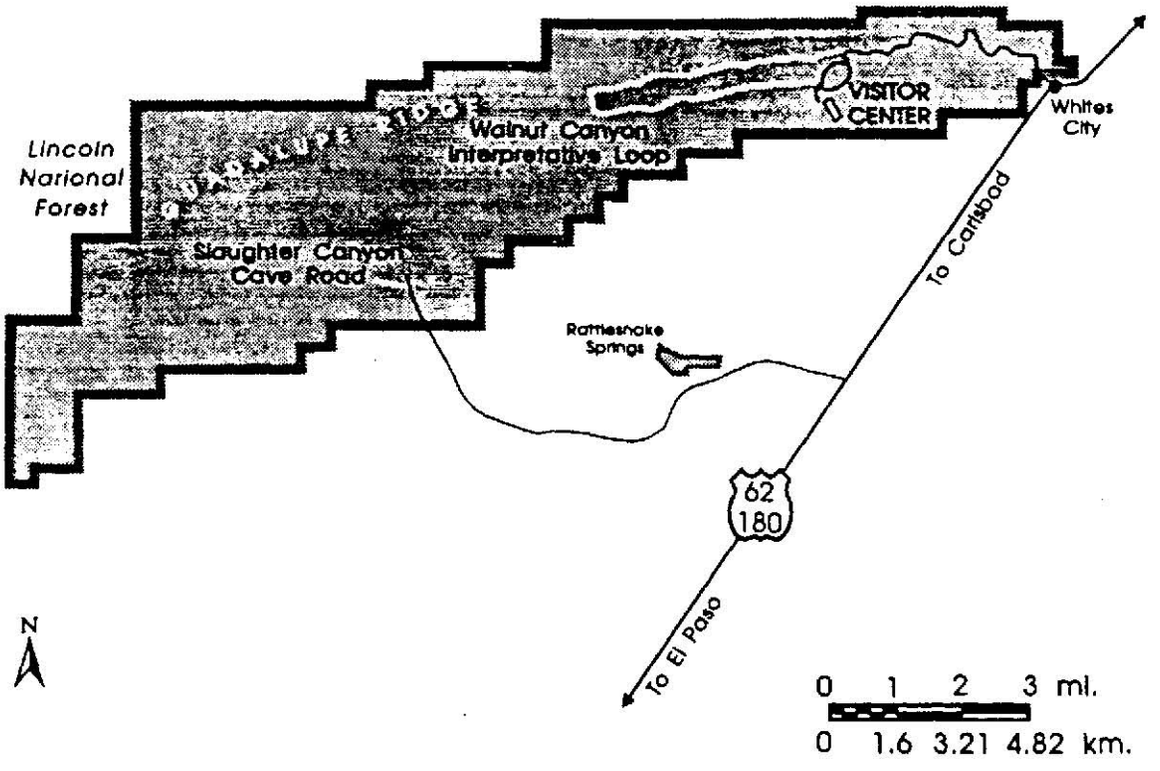
5. JUSTIFICATION FOR INCLUSION ON THE WORLD HERITAGE LIST

The Carlsbad Caverns National Park nomination, as prepared by the United States Department of the Interior, provides the following justification for designation as a World Heritage natural property:

(i) **Contains examples of the major stages of the earth's history and outstanding geological features** The Capitan Reef complex dates back to the Permian period, some 280 million to 225 million years ago. The exposed sections of this reef lying within the park are among the best preserved in the world accessible for scientific study. Geologists are able to study the rock formations not only through cave passages which penetrate the reef but also in exposures uncovered through erosion. Fossils include bryozoans, pelecypods, gastropods, echinoderms, brachiopods, fusulinds, sponges, trilobites and algae.

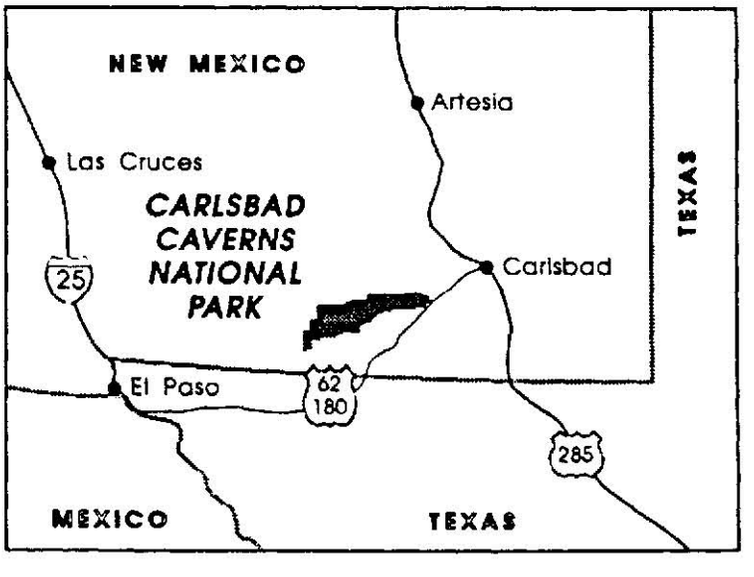
On-going geological processes are most apparent in the active portions of caves where rare speleothems continue to form. The most notable example of this is in Lechuguilla Cave, where helctites are forming underwater, a process which has never been described from any other cave in the world. Many other rare and unique speleothems such as the world's largest and most diverse collection of bacterially assisted "biothems" have been found within Lechuguilla Cave.

(iii) **Contains superlative natural phenomena or natural beauty** The large rooms in Carlsbad Cavern make this cave unique amongst other known and accessible caves throughout the world. Lechuguilla Cave contains the world's largest and most extensive accumulations of gypsum chandelier speleothems, many of which measure over 6m long and hang from the ceiling in large transparent selenite crystals. The cave also holds the world's largest accumulation of hydromagnesite balloons, subaqueous helictites, aragonite "Christmas Trees" and in-cave elemental sulphur and has an abundance of other calcite and gypsum formations.



Vicinity and Boundary

Carlsbad Caverns National Park



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WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

CARLSBAD CAVERNS NATIONAL PARK (USA)

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1. DOCUMENTATION

i) IUCN/WCMC Data Sheet (8 references)

ii) Additional Literature Consulted: Herak M. & Stringfield V.T. 1972. Karst; Courbon P. et. al. (ed.). 1989. Atlas of the Great Caves of the World 369pp; Middleton J. & Waltham T. 1986. The Underground Atlas. 239pp; DuChene H.R. et al. 1993. Report of the Guadalupe Caverns Geology Panel to the National Park Service; USNPS. 1994. National Cave and Karst Research Inst. Study. 36pp + annex.

iii) Consultations: 11 external reviewers, USNPS local park staff and cave specialists.

iv) Field Visit: March, 1995. Jim Thorsell.

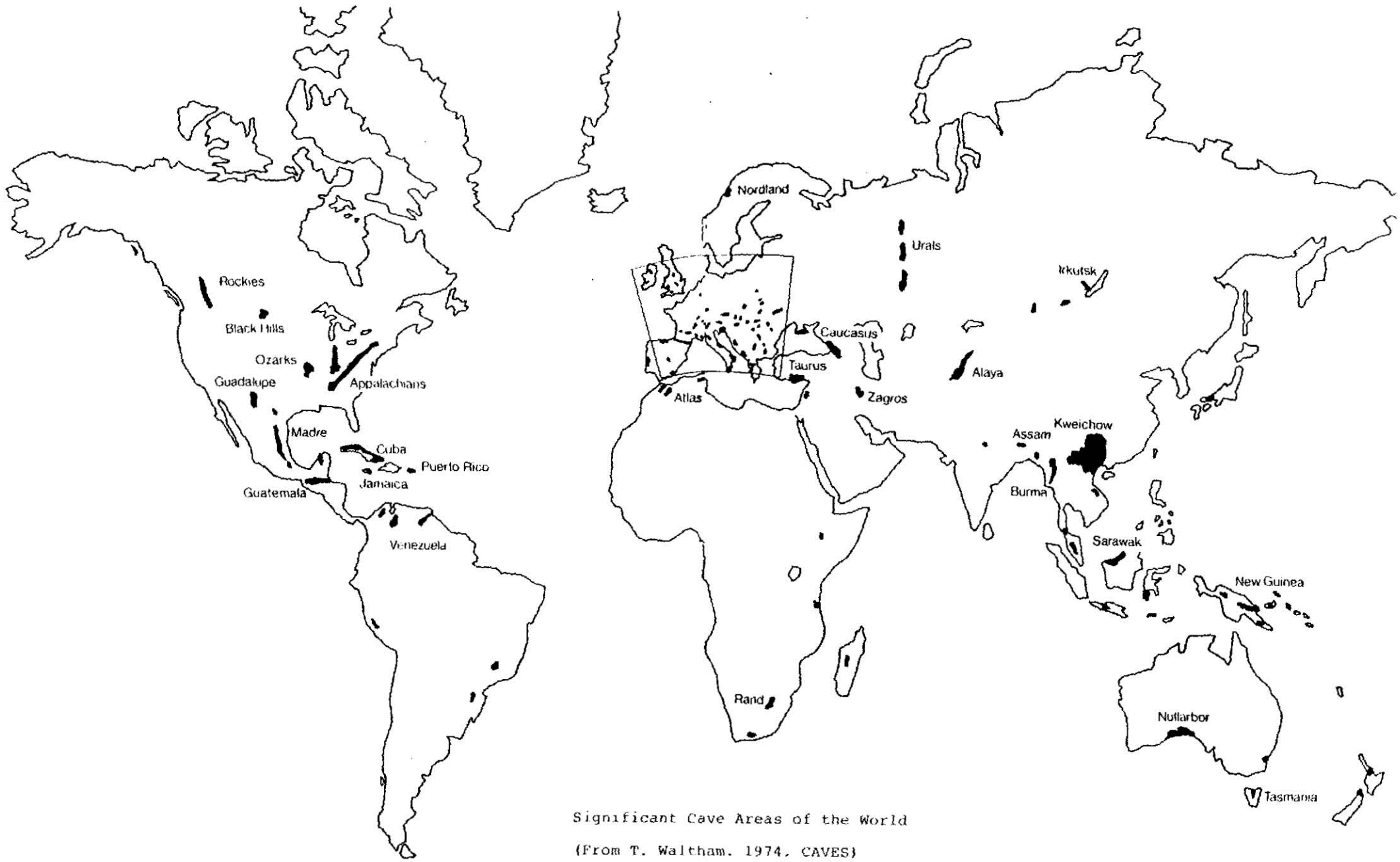
2. COMPARISON WITH OTHER AREAS

Karst cave systems are widespread natural features found in many parts of the world. The attached map indicates the location of some of the more significant cave regions. The USA alone has over 20 karst regions (see Map 2) and a total of more than 30,000 caves. Two sites have been inscribed on the World Heritage List for their karst features alone: Mammoth Cave in Kentucky and Skocjan Cave in Slovenia. Other very significant caves are associated features of other natural World Heritage sites in the Canadian Rockies, Nahanni, Grand Canyon, Tasmanian Wilderness, and the Australian Mammal fossil site. Other world class caves exist in Sarawak at Gunung Mulu and in Australia at Nullabor. In addition, the Agglatek cave and karst region in Hungary/Slovakia has also been nominated as a World Heritage site.

Reasonably complete inventories of the world's cave systems are available in the above cited references. These provide "Guinness lists" of the longest, deepest, and largest which are continually being revised as exploration continues. In assessing all cave nominations, IUCN has close liaison with the International Union of Speleology and carefully weighs their opinions in cave evaluations. In the specific case of Carlsbad Caverns National Park (CCNP), this Union as well as outside reviewers all agreed on the high natural values of the area. The relatively recently discovered Lechuguilla cave in the park was confirmed as having particularly exceptional features which, under strict protection, remain in an essentially undisturbed natural condition.

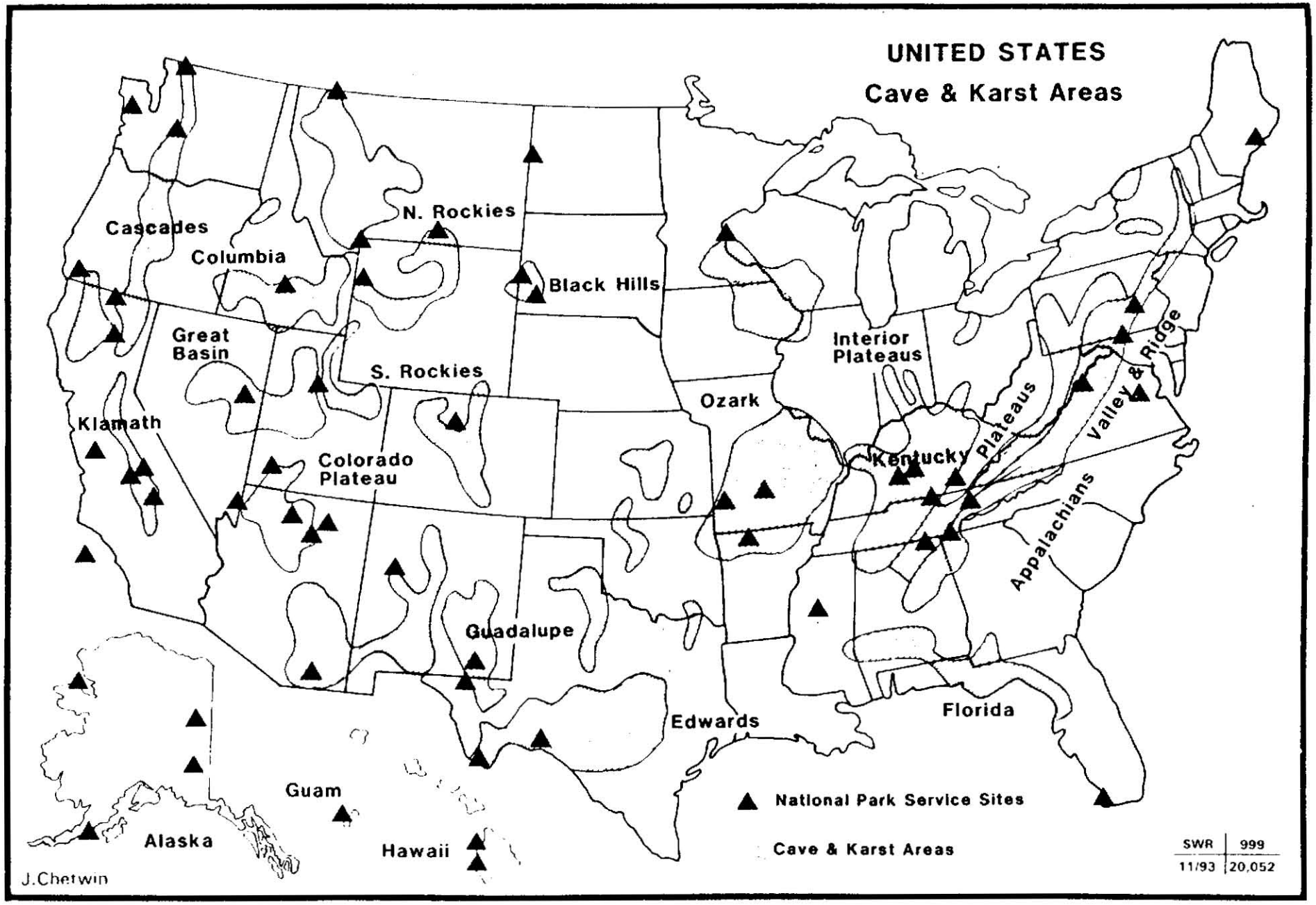
Carlsbad is radically different from the other two existing World Heritage caves. Mammoth Cave is notable for its enormous length, large level passages and jagged domepits. Skocjan is famous for its awesome river canyons and textbook portrayal of karst hydrogeology. CCNP is distinguished by its huge chambers which are far larger than those in Mammoth or Skocjan as well as for its decorative mineral features which also far surpass the other two. Carlsbad also contains 81 known caves, a very high concentration, with Lechuguilla now accepted as the single most outstanding of these and one of the most significant caves in the world in terms of scientific values.

In conclusion, CCNP contains some of the most outstanding caves in the world. It has spectacular beauty and its speleogenesis and biota and the natural condition of most of the caves put CCNP in a class of its own. Its features are distinctive from existing World Heritage cave sites and it does not duplicate values found elsewhere.



Significant Cave Areas of the World

(From T. Waltham. 1974, CAVES)


UNITED STATES
Cave & Karst Areas
Cascades
Columbia
N. Rockies
Black Hills
Great Basin
S. Rockies
Klamath
Colorado Plateau
Ozark
Interior Plateaus
Kentucky Plateaus
Valley & Ridge
Appalachians
Guadalupe
Edwards
Florida
Guam
Alaska
Hawaii
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CCNP is found within the Chihuahuan Biogeographical Province along with 22 other protected areas on the UN List of National Parks and Protected Areas. As its surficial environment is not a feature that is being considered, a comparison on this basis is not relevant. Nevertheless, it should be noted that the park has nationally significant values in terms of its Chihuahuan desert flora and fauna as well as important cultural heritage resources.

3. INTEGRITY

Mining for guano and tourism have had some effects on the integrity of some of the 81 caves found in CCNP. During the period 1903-1923 an estimated 100,000 tons of bat guano was removed by hand tools from the entrance areas of the accessible caves. Other human impacts from tourism became noticeable but in the 1970s various management measures were adopted which have largely brought these within acceptable limits. The park's updated management plan is due for approval in 1995 and various other specific cave management plans have been prepared. Since its initial exploration a decade ago Lechuguilla cave has been strictly managed allowing only closely monitored visits by researchers.

One unfortunate cave-related loss has been the decline in the Mexican free-tailed bat population which has declined from 5 million plus in the 1920s to less than a million today. As the bat flight to and from the caves is truly a wildlife spectacle, efforts are being made to reduce further losses. As the losses occur when the bats migrate to Mexico this requires international cooperation.

The one threat that IUCN would underline as serious is the potential for oil and gas exploration along the park's boundaries and the associated construction of transmission and storage areas that would accompany it. The problem has been studied by a panel of geologists who have recommended a "cave protection" zone outside of the northern boundary of the CCNP. If the Committee decides to inscribe the site a recommendation supporting the findings of the Panel's report should also be sent to the American authorities.

4. ADDITIONAL COMMENTS

The nomination, submitted in September 1994, used the former criteria for natural sites that expired in 1993. IUCN has re-written the summary of the nomination in conformity with the now existing criteria. The US authorities have been notified of this revision.

5. EVALUATION

Of the many thousands of caves occurring in North America and in the nearby Guadalupe Mountains, the caves within the CCNP are among the most outstanding. They are also notable worldwide because of the size, their mode of origin and the abundance, diversity and beauty of the decorative rock formations (speleothems) they contain. The Lechuguilla cave is particularly noteworthy as an underground laboratory where geological processes can be studied in a virtually undisturbed environment. The site clearly meets natural criteria *i* and *iii* and fulfills all conditions of integrity. The only threat that faces the park is oil and gas exploration near its borders. A decision for inscription should be accompanied by an expression of support for creation of a cave protection zone to the north of the park (i.e. condition of integrity *vi*).

6. RECOMMENDATION

Carlsbad Caverns National Park meets natural criteria *i* and *iii* and should be inscribed on the World Heritage list.