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War in the Pacific

GUAM COMPREHENSIVE OUTDOOR

RECREATION PLAN

October, 1977

Guam Natl. Seashore

DEPARTMENT OF PARKS AND RECREATION

P.O. BOX 2950

AGANA, GUAM 96910

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A. INTRODUCTION

This 1977 Recreation Element of the Guam Comprehensive Development Plan is to show a comprehensive system of areas and sites for recreation on Guam.

Predecessors to this plan include:

1. Guahan, San Minagof, Sagan Descanso, 1965, prepared by the Department of Land Management.
2. Outdoor Recreation on Guam, 1966 plan, prepared by Lawrence C. Johnsrud and Associates.
3. Outdoor Recreation on Guam, 1971.
4. Outdoor Recreation of Guam, 1973.

The extent of treatment in this plan includes discussions of the territory characteristics, inventory of existing recreation facilities (public, private, and military) recreation consumer analysis, projected facilities demand, and a plan of priority groupings to provide needed facilities. The principal objectives of this plan are to:

1. Provide a current plan that is responsive to the recreation needs on Guam.
2. Outline potentials and limitations, designate special problems, outline programs and actions, and establish priorities for the provisions of the needed recreation facilities.
3. Satisfy requirements necessary to maintain eligibility under the Federal Land and Water Conservation Act of 1965, as amended.
4. Develop a continuous planning process that provides for inter-governmental coordination, community involvement, maintain relevant recreation supply, demand, and need data.
5. Provide guidelines for the implementation of recreation policies and recommended actions.

6. Provide guidelines for the rational allocation of acquisition and development funds.

Legal Authority

The Department of Parks and Recreation is responsible for the overall planning for future outdoor recreation facilities on Guam as expressed in Guam Public Law 12-209:

Section 26017 (c) the Department is responsible for "...Formulating a comprehensive recreation policy and a long range plan relative to the development of new recreation facilities and programs within the territory; such policy and plan to be developed in cooperation with other federal and territory agencies, interested organizations and citizens, and to be submitted to the Legislature...."

Section 26017 "Department may serve as the agency for compliance with the terms of any Federal program, as determined by the Governor which concerns the implementation or development of plans for the conservation or utilization of water related resources".

Section 26003 (g) the Director shall have the duty "To be State Liaison Officer for the Bureau of Outdoor Recreation, State Historic Preservation Officer for Guam, and State Liaison Officer for Forestry and Conservation Programs.

Maintenance of the Plan

A planning commitment continues beyond the completion of this plan. Subjects requiring research and feasibility study are contained in the implementation section of the plan, and most of the projects will require individual public

hearings prior to planning and construction. In addition, over this period of time, if policies of the Government of Guam change significantly from presently identified position statements, the Department of Parks and Recreation will process and forward such amendment changes to the Bureau of Outdoor Recreation following established procedures.

B. REVIEW OF FINDINGS, POLICIES, AND RECOMMENDATIONS

At present, the outdoor recreation potential of this beautiful tropical island is partly unexploited. The military services maintain developed facilities for their personnel, but these are not available to most island residents or to tourists. The limited facilities of the Government of Guam and private groups are primarily devoted to beaches sports and games. Many beaches, the dramatic waterfalls and the most beautiful scenic areas are seen and used only by the most adventuresome. They are hard to find, difficult to reach and often in private or military ownership, although some should remain inaccessible and natural.

In addition, dependence upon informal recreation opportunities will no longer be adequate because of urbanization, need for facilities, and the tourism industry.

Based upon the above important elements and the elements of this report, several key finding are relevant which are:

1. The anticipated growth of Guam's population will put additional demands for added parks and recreation services.
2. Visitors to Guam will require high standards of park areas and facilities.
3. Guam's many varied geology feature and ecosystems are in need of conservation of their values. Some of these values can be utilized for outdoor recreation while some deserve preservation.
4. Private and military recreation areas and facilities should be open to the general public through an arrangement with the Government of Guam.

5. Certain Government of Guam owned areas need immediate park development.
6. Certain types of recreation facilities are badly needed by the people of Guam such as baseball and softball fields, and basketball and volleyball courts.
7. A wider range of recreation opportunities should be offered on Guam.
8. Additional planning, research, and education is needed on the role of recreation and parks on Guam.
9. Legislation is required to define the Guam Park System.
10. Intergovernmental coordination in parks and recreation should be improved.

C. GUAM CHARACTERISTICS

Guam is only 30 miles long and 4 to 9 miles wide with 212 square miles of land, but contains a wide variety of environment and possesses an outstanding degree of natural beauty. For the purpose of this report, it is sufficient to cite the primary characteristics that will affect recreation potentials. Guam is shown in figure 1 with its location shown in figures 2 and 3. A variety of land forms is afforded on Guam by the combination of coral reefs and volcanic formations that make up the island. The northern half of the island is a large, rolling plateau of coral raised hundreds of feet above sea level, resulting in dramatic cliffs and overlooks at many points on the water's edge. The southern half of the island consists of volcanic mountains running down to the sea and surrounded by low lying coral reefs.

Geologically, Guam is divisible into two areas. During the ancient phases of the island's existence, these areas were probably two separate islands. The southwestern geologic zone is highly mountainous and largely volcanic, ringed on the west by a mountain range which reaches an elevation of 1,336 ft. at Mt. Lamlam. The coastal plain varies in width but is generally narrow. The interior of this zone is a high savannah plateau with steep-sided valleys covered predominantly with sword grass.

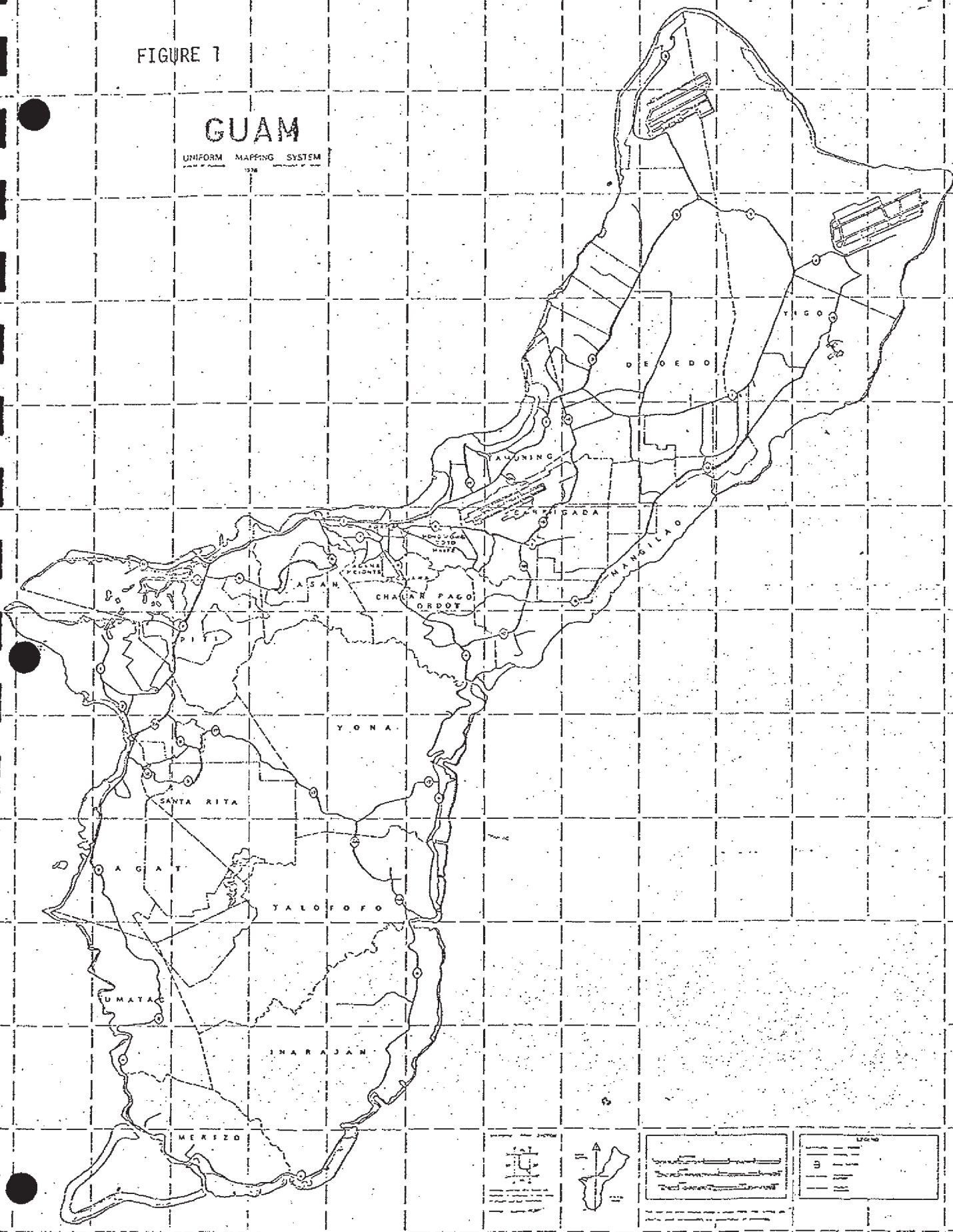
Evidences of recent volcanism, lava flows, etc., are not uncommon on the southwest and south coastal areas. On the high plateau and in the mountain range, deposits of fine-banded and varicolored clays can be found, which give evidence that this portion of the island was once submerged.

In contrast the northeastern half of Guam is characterized by an expansive coralline-limestone plateau. Mt. Santa Rosa, rising 850 ft. above sea level,

FIGURE 1

GUAM

UNIFORM MAPPING SYSTEM
1978



2L 2R 3L 3R 4L 4R 5L 5R 6L 6R 7L 7R 8L

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2L 2R 3L 3R 4L 4R 5L 5R 6L 6R 7L 7R 8L



	Road
	Boundary
	Stream
	Contour Line
	Spot Height

Scale	
1:50,000	1 inch = 0.833 miles
1:100,000	1 inch = 1.667 miles
1:200,000	1 inch = 3.333 miles

FIGURE 2

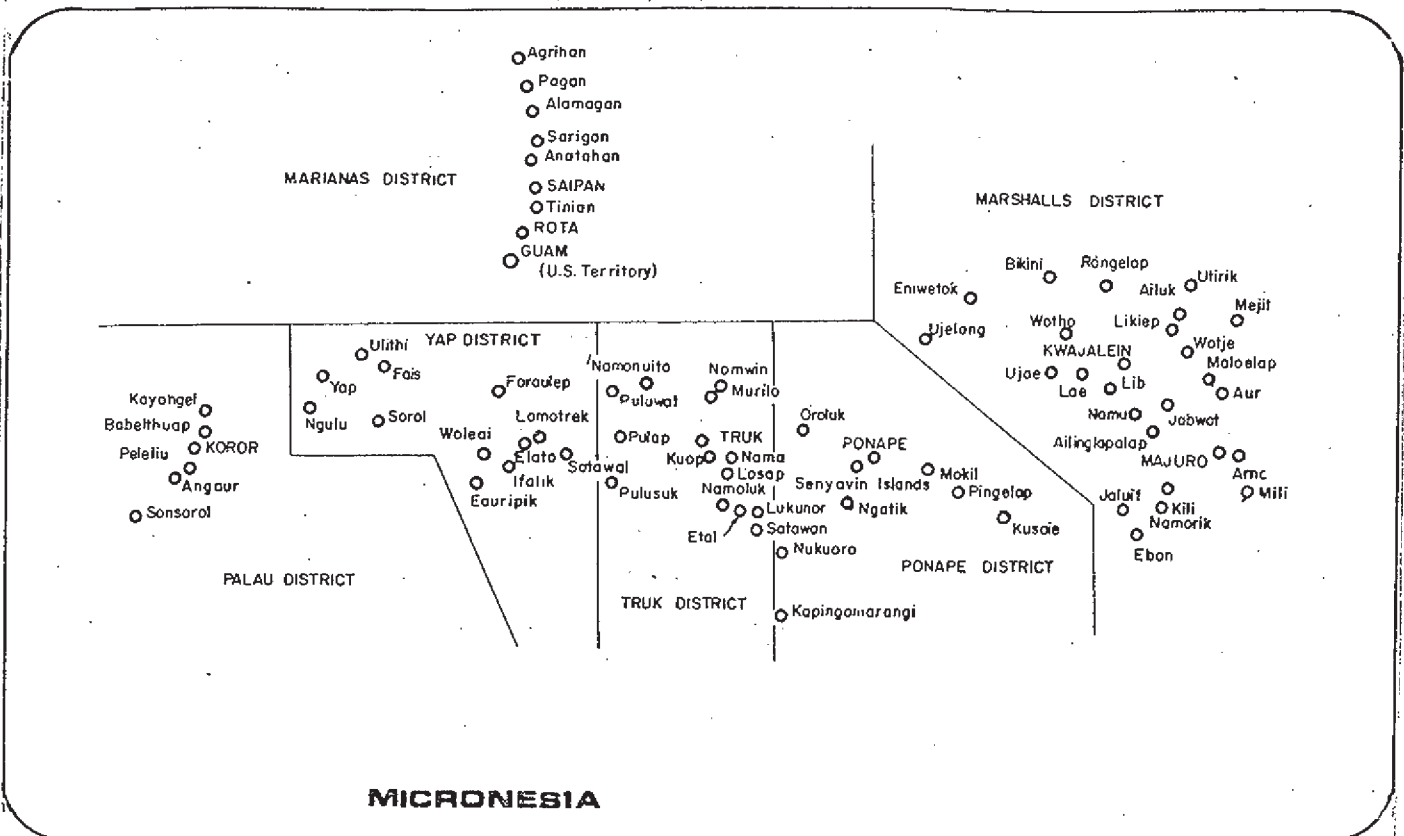
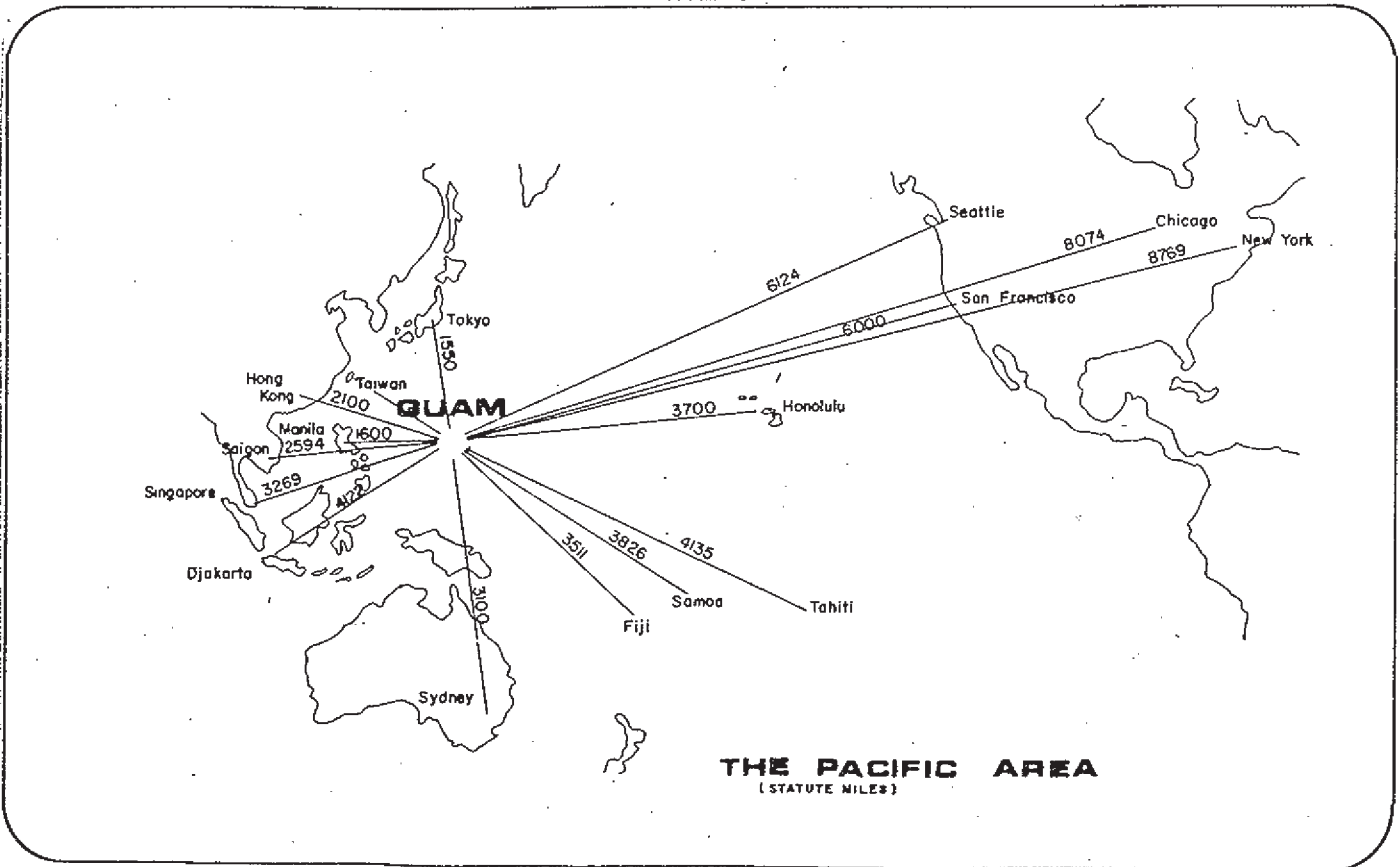


FIGURE 3



is the only principal relief on an otherwise flat surface. This plateau is poorly supplied with surface water and its soil mantle is generally thin but fertile. The plateau extends around and out from Mt. Santa Rosa, which protrudes its volcanic red-clay mass through the limestone. The cliffs, which extend from the plateau to the shoreline, are high and massive along the northeast and northwest coastal areas a height of 600 ft. is not uncommon. Trails lead from the plateau to the lower coastal and reef areas, where fishing and crab-hunting grounds are plentiful. This coastal plain has in the past supported large coconut plantations.

The northern plateau is typically covered with a dense jungle growth which is virtually impenetrable. The ground surface is often characterized by extensive eroded and jagged limestone making it difficult to traverse.

Between the southwest and northwest geological zones is a low connecting neck that tapers to about four miles at its narrowest point. This neck has been the center of population since historical times; the Capital of Agana is situated in this areas. The geology is shown in Figure 4.

More than 40 streams rise in the southern mountains. Several flow into moderate size rivers that offer fresh water recreation resources and a series of dramatic waterfalls. Others feed a large interior lake-Fena Reservoir, which is a large man made storage basin almost two miles in length. Where the rivers and streams come down to the ocean, a series of 22 bays have been formed, many having excellent recreation potentials. Overlaying the coralline terrain and interior volcanic valleys is a covering of lush, tropical vegetation consisting of vines, shrubs, grasses, flowers, ferns, and trees. The lush vegetation enhances the beautiful land forms and contributes to the island's exotic character.

FIGURE 4: GUAM GEOLOGY

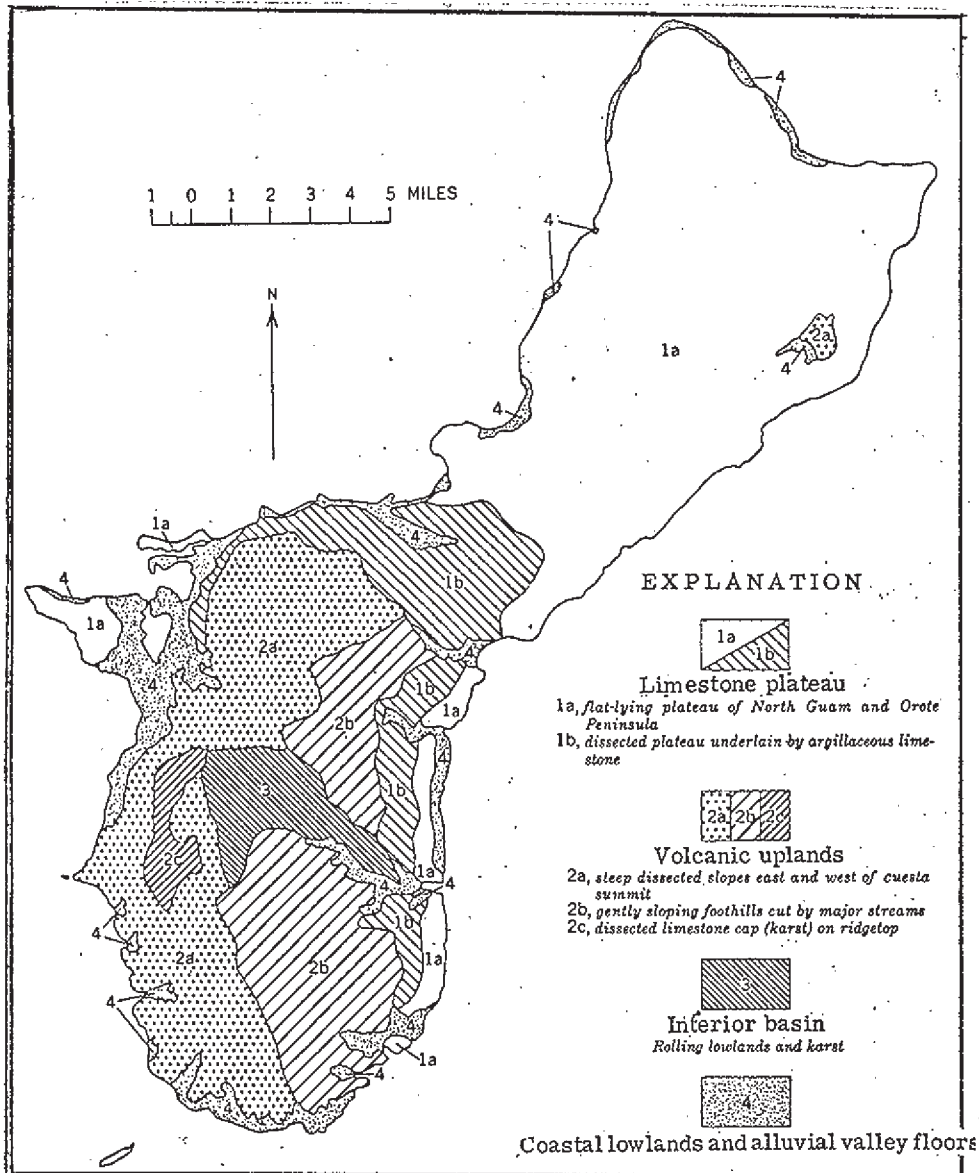
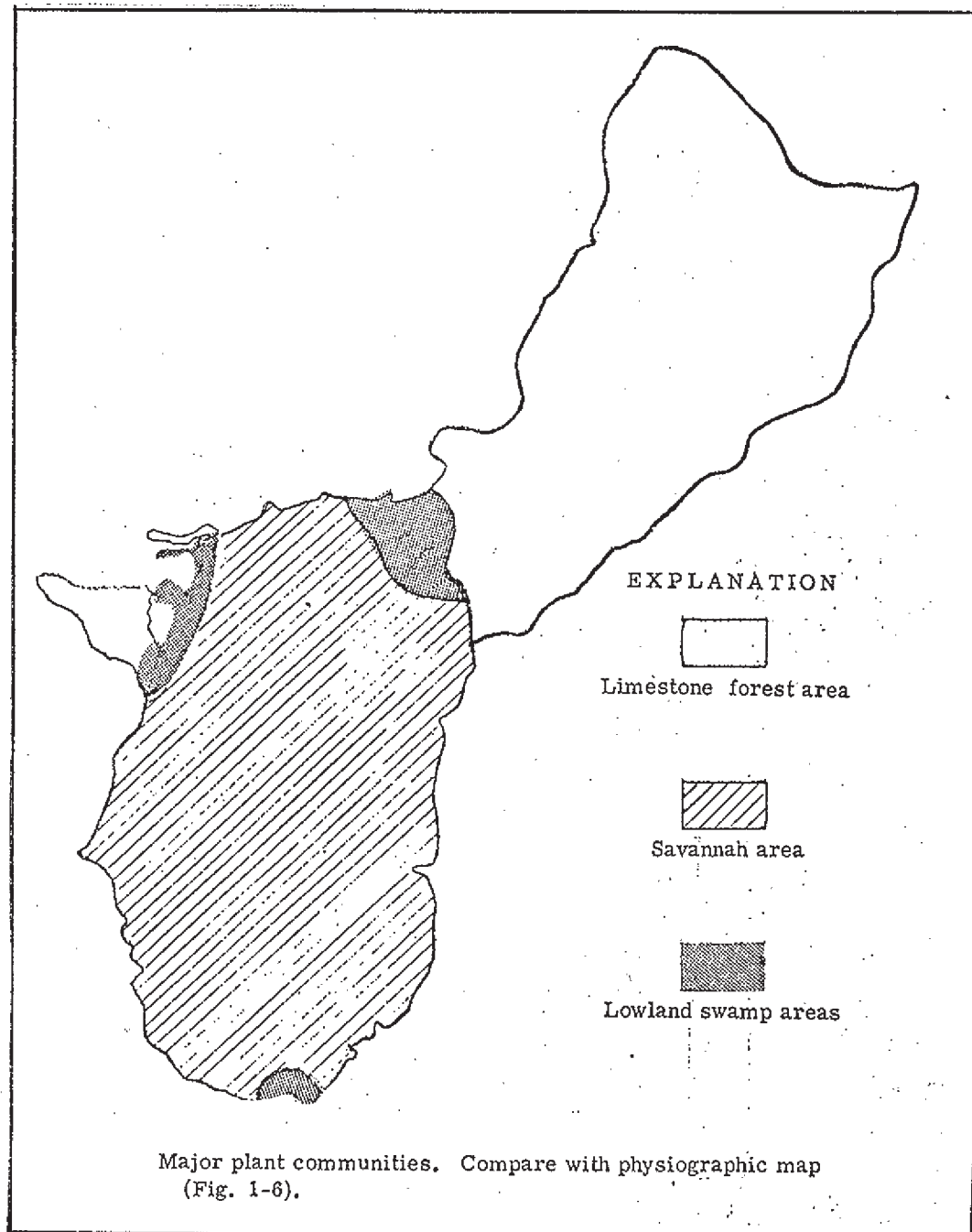


FIGURE 5: GUAM VEGETATION

Ravine and Marsh too small in area to be shown



Climate

Seasons are distinguished primarily by the amount of rain fall. Of the average 90 inches of annual rainfall, about 70 percent falls during the months from July through November. June and December are transitional months and the period from January through May can be quite dry. Temperature and humidity vary slightly from month to month. Daytime temperatures are usually in the middle-to-high eighties with humidity 65 to 80 percent. At night, the temperatures drop to the middle-to-high seventies but humidity rises to level generally between 85 to 100 percent. The warm humid climate is moderated by the tradewinds, especially during the dry season, but air conditioning is a factor in most new construction. Permanent facilities of all types must be designed to withstand the high winds associated with tropical storms and typhoons.

Vegetation

Guam's vegetation cover can be grouped into five basic types: limestone forests, ravine, marsh, swamp, and savannah as shown on figure 5.

Limestone forest communities comprises over 90% of the vegetation found on the northern half of Guam. Pure or climax communities are seldom encountered, however, the areas generally include:

- Banyan
- Wild Breadfruit (Threatened)
- Fago
- Jaga
- Chopak

along with lianas and epiphytes.

Ravine communities exist in lowlands where moisture accumulates, especially

in the valleys and ravines of the southern half of Guam. These include:

- Pago (wild hibiscus)
- Federico
- Betelnut palms
- Coconut palms
- Pandanus

along with lianas and various ferns and orchids.

Marshes of fresh or brackish water exist in lowland swamp areas. These include clusters of bullrush or karriso surrounded by the following:

- Avicennia (endangered)
- Pago (wild hibiscus)
- Acrostichum aureum
- Sedge (threatened)

with scattered clumps of taro, ginger, and mosses. Swamps of three types are found on Guam. The nypa palm swamps are found at the mouths of the Pago, Ylig, and Inarajan Rivers on the southeast side of the island. The mangrove swamps (threatened species) are found along Apra Harbor and mouths of the rivers along the southern tip of the island. The barringtonia swamp (endangered species) is found at the mouth of the Talofoto River.

Savannah is one of the Guam's large plant communities covering almost all of the southern half of the island. The two dominant grasses are swordgrass and Dimeria spp. with scattering of ironwood, Philippine ground orchid, ferns, and several members of the mint and myrthe families.

Wildlife

Guam's recreation related wildlife includes large and small game, game birds, and inshore freshwater and deepsea fish.

The Guam deer were brought to the island in 1775 and have thrived since. The deer may mate at any time of the year, and are considered overpopulated

at Andersen Air Force Base (AFB) and at the Naval Magazine in Guam's south central Fena Reservoir area. Hunting is controlled with a season set for non-military property and one day a month for Andersen AFB. In 1975, 1,011 hunters recorded taking 109 deer from military property. The Air Force reserves 12,700 acres of deer habitat through maintenance of 40 forest clearings of one acre each. The population objective is one deer per 16 acres. Deer also thrive in the Bolanos Reserve area, in south central Guam, however, access is a major problem.

Carabao or water buffalo herds exist in the savannah area of south central Guam.

Coconut crabs are delicious and considered a delicacy. They return to the sea to spawn where the young remain in the water for several months, then they migrate to shore where they live in burrows or cracks in cliffs, and feed on coconuts in strand communities.

Fiddler crabs exist in burrows located between high and low tide levels of the mangrove swamps.

Wild pigs live in almost all undeveloped areas of Guam. Andersen AFB maintains 14,900 acres of wild pig habitats. These are protected by designation of a season and issuance of hunter's licenses.

The Guam Rail is a local flightless bird living in the forest area of the northern plateau, being conspicuously absent from the open savannah areas of the south. Andersen AFB maintains 17,000 acres for habitat of this species.

Fruit bat on Guam is considered an endangered species with hunting closed since 1973. In 1962, a colony of 500 to 600 bats was observed at Andersen

Air Force Base with others at Orote Point and Fena Lake area, for a density of 40 bats per 100 acres of known roost cover. In 1975, the density was estimated at one bat per 500 to 1,000 acres of roost cover, with the largest sighting being 50. The only two remaining roosts of any size on Guam are within the Andersen AFB, where 500 acres are reserved for this species habitat.

The Philippine turtle dove was introduced around 1774 and is hunted during designated seasons. It is common but does not flock. Andersen AFB designated 7,500 acres as reserves for these birds with an objective of one dove per three acres.

A small Chinese painted quail was introduced by the Spanish and inhabits open grass areas. These are protected by designated hunting seasons, and Andersen AFB reserves 2,300 acres for these birds, with an objective of one quail per two acres.

The reefs fringing Guam abound in a variety of wildlife. This living coral reef edge is easily accessible to swimmers and divers at many locations. Due to the rough sea conditions on the east coast, at most times of the year, human hunting and collecting of sea life is confined to the west Cocos Lagoon and Apra Harbor.

Hunting for edible shell fish is popular along protected reef flat areas, as the shells are highly valued by collectors. Octopi, a lobster-like crustacean, and various small game fish are also hunted in the near shore waters. Laws presently restrict the collecting of living coral to depths below 10 fathoms.

Estimated annual inshore fishing participation is estimated at 24,180 people for 80,190 hours, harvesting 186,269 pounds using mostly nets and Tures. Most of this fishing is conducted during September, December, March, and April. Fishing weirs contribute an additional 39,000 pounds. The major species involved are grouper and snapper. Deep sea trolling and bottom fishing involves an approximately 924 boats for 8,694 boat hours harvesting 38,823 pounds. Most of this activity is during March and December. Charter boats are available for this activity which involves such species as marlin, red snapper, and tuna.

The Department of Agriculture is vested with the responsibility of protecting the endangered and threatened plants and wildlife of Guam. A preliminary listing shows that ninety-one plants are endangered while seventy-three plants are threatened. Sixteen birds are endangered and three are threatened. In addition, four mammals are endangered. Finally, four reptiles are endangered and one is threatened.

HISTORY

The island's earliest known settlers are believed to have migrated from Southeast Asia around 1500 B.C., and developed a civilization of up to 100,000 people by the time of European contact in 1521, when Magellan traditionally landed. The Jesuit missionaries, headed by Father Luis San Vitores, established the Catholic Church as a focal point of the culture starting from 1663. The clash of European and Chamorro cultures led to bloodshed and epidemic diseases that destroyed the pure precontact cultural system.

The Spanish populated the island with basically Filipino laborers and fortified the island to protect and supply the Manila galleons that sailed annually from Acapulco, Mexico, with silver for Manila, between 1568 and 1815.

Guam became an American possession in 1898 as a result of the Spanish-American War, and was governed by the U.S. Navy until being seized by Japan in 1941 during World War II. Japan occupied and fortified the island. However, Guam was liberated by American Forces in 1944.

In 1950, the Organic Act of Guam granted U.S. citizenships and replaced the Naval Government with an appointed civilian system. The first elected governor was elected in 1971. The requirement of security clearance for entry into Guam was abolished in 1962, making possible the resulting boom in tourism and business. In 1973, Guam gained a non-voting seat in the U.S. House of Representatives.

Guam's history is a mixture of immigrants mingling about in search of opportunities, Guamanians striving to harmonize their cultural identity with a rapid economic development, and military operating on this strategic island in the Pacific.

The history of the island and its people affects outdoor recreation in at least three ways.

First, the Chamorro culture of the indigenous population is distinctively different from that of the continental United States. Social life revolves around the extended family group and the Church. Recreation demand is also concentrated around the extended family, although this is changing.

Second, the centuries of Spanish colonial rule, the more recent involvement

in military history and the early Chamorro civilization have left many historical artifacts on the island. These artifacts represent a significant cultural heritage and present many opportunities for facilities that are both educational and recreational. It will be the cornerstone of Guam's tourist industry.

Third, both the unique culture and varied history of the island are an attraction for tourists. Guam's role in World War II is especially interesting for tourists from Japan, Australia, and the United States. These attractions can be fully exploited in the War in the Pacific National Historical Park.

Culture

The resident population can be divided into three distinct groups. These consist of Guamanians, military personnel and permanent residents who were born elsewhere. The groups are significant because of their differing recreational interests.

Guam's indigenous inhabitants were called Chamorros. Today approximately 45 percent of the population associates themselves with this ethnic background. The native Chamorro language is still used in everyday friendly and family conversation, although English is the common business language. The traditional social life centers around the extended family and the Catholic Church, a lifestyle left behind by the Spanish. Weddings, wakes, christenings, and fiestas are celebrated with major vigor. A christening is frequently celebrated by a party over 100 people, including friends, relatives to enjoy a fiesta of Guam's favorite dishes.

Social activities are plentiful, relaxed, and informal. While the average household consists of the nuclear family, many homes are occupied by family members from two or more generations. Extended family relationships are important and form the basis of many social responsibilities. This aspect of the culture is well exemplified by the many relatives who turn out to help prepare for and celebrate weddings and fiestas. Respect for the elderly and support for the grieved are also traits that bring together friends and families alike.

The military population has an unusual effect on outdoor recreation because of a disproportionate share of males, a large percentage of persons residing in group quarters and an age distribution heavily weighted in favor of young adults. All of these groups have a high propensity for active outdoor recreation. The non-indigenous civilian residents include a high percentage of persons from Hawaii and the Mainland. This group resembles more closely the age-sex, income and interest patterns found on the Mainland. It is also the smallest population group and will have the least effect on patterns of recreation.

A fourth group of tourists will have to be added to the resident population to complete the recreation picture.

Because each group has such distinctive characteristics and different recreational interest, they will be considered separately for purposes of establishing demand and special needs.

Population

Because recreation is people oriented, its major determinate is the total population numbers. The estimates shown on table 1 and 2 are being used

TABLE 1: RESIDENT POPULATION OF GUAM

	Chung	OB (B)	Chung (C)	Working Total	Guamanians *	Military Dependent *	Other *
1970	85,380	89,890	85,380	84,996	50,191	22,316	14,489
1975	105,400	106,310	106,400	106,000	47,000	22,000	37,000
1980	126,000	126,956	132,200	127,000	56,700	22,000	48,300
1985	136,000	150,982	158,800	151,000	67,100	22,000	61,900
1990	165,400	179,352	198,000	179,000	78,500	22,000	78,500

* 1970 Official Census

AGE AND SEX DISTRIBUTION OF 1970 CENSUS

AGE GROUPS	TOTAL	%	MALE	FEMALE	% FEMALE	COMPARATIVE U.S. DISTRIBUTION	
						% FEMALE	% TOTAL
0-5	13,967	16%	7,166	6,813	49%	50%	
6-17	24,595	29%	12,649	11,946	49%	50%	45%
18-24	13,446	16%	8,353	5,093	38%	50%	
25-39	18,051	21%	10,374	7,677	43%	51%	18%
40-64	13,445	16%	8,156	5,289	40%	52%	27%
64+	<u>1,480</u>	<u>2%</u>	<u>664</u>	<u>816</u>	<u>56%</u>	<u>59%</u>	<u>10%</u>
TOTAL	84,996	100%	47,362	37,634	45%	51%	100%

by the Government of Guam as a useful range from which to make decisions. However, they do not include a projection by age or sex. These estimates were developed by Professor Roy Chung, a demographer once with the University of Guam, and Quinton-Budlong, a private firm. Population distribution is shown on Figures 6 and 7.

The major group on Guam is those descending from the Chamorros, the earliest know settlers of Guam, of Malayo-Polynesian stock probably originating in Southeast Asia and settling on Guam, between 200 BC and AD 500. This group, although completely intermarried with others (Filipinos, Japanese, Spanish, Europeans, etc.) still retains a distinct language, and cultural and social characteristics. The distinctive characteristics can be expected to moderate as the group continues to intermarry, and other ethnic group representatives increase. This group has strongly accepted Catholicism due to Jesuit influence from 1668. The Guamanian birthrate is high, resulting in large families and a young population. Although the Guamanian population is expected to increase, this group's proportion of the population is expected to decrease due to increase by other groups, such as the Filipinos, Chinese, and Statesiders.

Since age and sex of participants have strong bearing on both percentage and rate of participation in individual activities, detailed data on these population characteristics is important for meaningful recreational planning. The low percentage of females at all age groups is noteworthy, particularly when compared to the overall United States. This is likely a result of the large military population and contract alien workers, with disproportionate shares of males. In the age groups of 40 years old and over, the discrepancy with the national figures may also be the result of activity during the Japanese occupation of Guam in World War II. The high percentage of the population in the lower age groups is also important and becomes

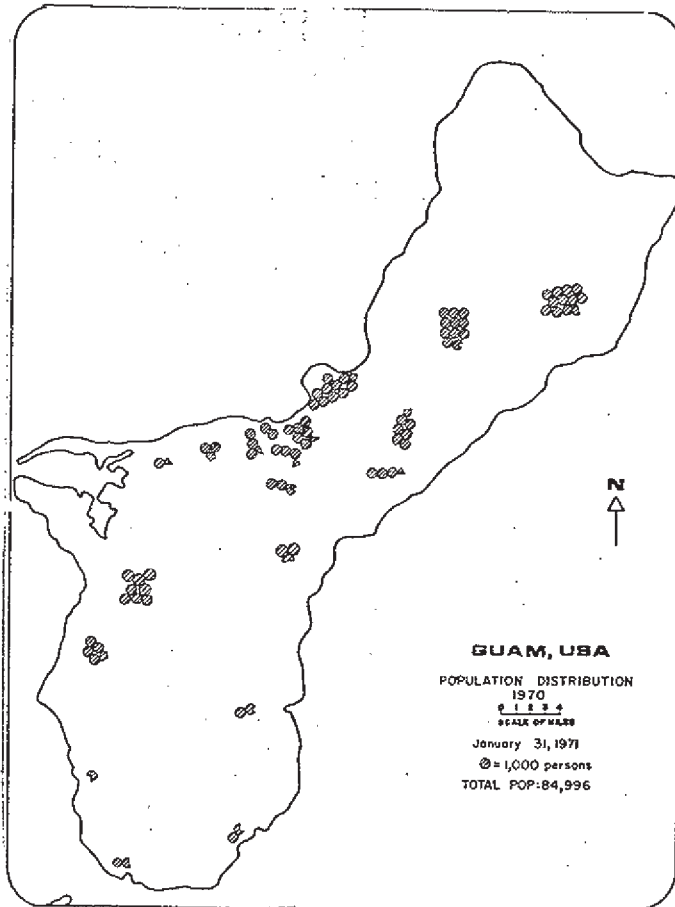


FIGURE 6

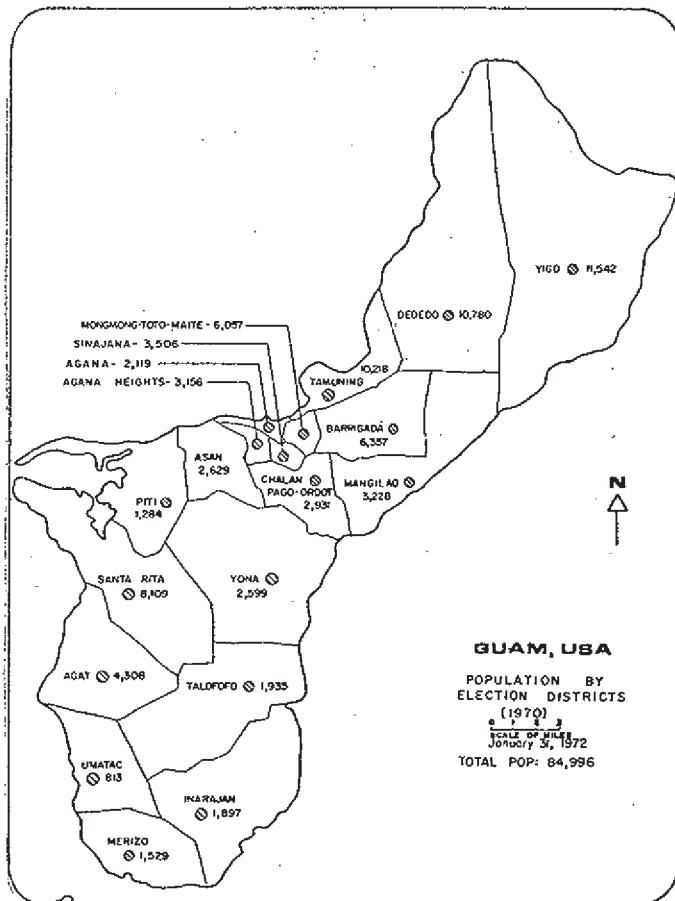


FIGURE 7

more distinct when compared to the national figure. These must be considered when applying any national standards and in general planning to meet recreational needs since energetic young males participate in more active activities, like surfing, scuba diving, hunting, basketball, and baseball, than older people.

With the opening of many facets of life to females that were previously male dominated, we expect to see the integration of male and female participation in many recreation activities. This is expected in tennis and golf, and to a certain extent in baseball, football, basketball, hunting, and scuba diving and would have the ultimate result of growth in total activity participation even at constant population levels.

Guam has approximately 9,800 handicapped persons, 10% of the population compared to 12% nationally. Almost two-thirds of Guam's disabled fall in the 30 and under age groups. Percent distribution of the major handicaps in 1972 was as follows:

Mentally ill	16%
Hard of hearing	16%
Heart condition	10%
Mental retardation	9%
Amputation and orthopedics	9%

The incidence of mentally ill and mental retardation are thought to be understated due to the local stigmas attached to admission of such a disability in the family.

The handicapped call for special consideration in developing recreational plans and facilities such as inclusion of ramps, railings, and special parking areas. Such people are frequently capable of fishing, walking for pleasures, picnicking, swimming, or attending sports events, but should avoid certain activities depending on the activity.

A major portion of those pursuing and seeking recreational facilities on Guam are tourists. This major industry to Guam started in 1963 when the requirement of security clearance for entry into Guam was abolished. The majority of tourists are from Japan. Statistics from the United States Travel Service in 1975 indicated Guam's visitors from Japan are under 30 years of age (72%), singles (59%), blue collar workers (53%), members of a family with an annual income of less than \$10,000 and frequently honeymooners (39%). This profile is projected to continue due to Guam's low travel cost proximity to Japan and yet competition with Hawaii for higher income groups.

Tourism is expected to increase or at least hold its own even though 1975 showed a decrease in tourist arrivals on Guam; this was because of the recession in Japan and elsewhere, cancellation of charter flights from Japan, and unfavorable publicity concerning Guam's participation in the Vietnamese refugee program. 1976 reflects continued problems chiefly brought by the impact of Typhoon Pamela. However, the tourist industry remains the cornerstone of the civilian sector of the economy.

Actual number of visitors to Guam:

1970	46,581
1971	84,885
1972	139,833
1973	187,471
1974	233,891
1975	260,237
1976	223,096

The visitor projections shown below are based on a study prepared by Kuriako Athapilly for a special project paper at the University of Guam on December, 1975. The number of visitors is projected at different annual growth rates of 10, 15, 30%.

Projected numbers of visitors to Guam at different growth rates:

1980	339,000	528,000	817,000
1985	509,000	740,000	1,490,000
1990	679,000	817,000	1,809,000

In attempts to better understand and attract older and higher income groups, a study was undertaken in Japan during February, 1976. This Guam Image Study surveyed age groups of 30 through 45 and 46 through 60 years old with income groupings of under \$20,000 and over \$20,000. Recreation related findings are as follows:

Important aspects of choosing a travel destination were expressed as: (Based on mean of a scale of six)

1. Clean air and sea - 5.74
2. Scenery - 5.66
3. Hotels - 5.17
4. Reasonable prices - 4.92
5. Restaurants - 4.66
6. Pacific island's culture - 4.55
7. Shopping (lower for younger bracket) - 3.88
8. Night life (lower for younger bracket) - 3.85
9. Beaches (higher for younger bracket) - 3.77
10. Tropical climate (higher for younger bracket) - 3.60
11. Sports (higher for younger bracket) - 3.29

The highest associations of Guam are with:

1. War (33%)
2. Tourist area (highest with younger and lower income) (29%)
3. Clean and pretty ocean (25%)

A very low association was found with "lots of greenery". (2%)
The survey group reflected a high image of Guam being for young people.

Reasons for positive interest in Guam are:

1. Easy overseas travel (8%)
2. Ocean is clean and pretty (7%)
3. Historical background (highest reason in older bracket) (6%)
4. Nature is beautiful (5%)
5. Tropical feeling (4%)

When asked of their interest in seeing war relics and historic sites, 55% showed interest while 31% were not interested, with higher interest being found in the older and higher income brackets. Seventy-seven percent of those surveyed had never heard of the Chamorro people or their culture, with an even higher percent being younger and of lower income. Optimum length of stay on Guam was expressed as 3 or 4 days, with the lower income and older brackets choosing 3 days.

Activities they would like to participate in, at a place like Guam, are as follows:

1. Go to beach/swim (21%)
2. Take it easy (21%)
3. Touring, sight seeing (17%)
4. Enjoy scenery (15%)
5. Visit war sites and graves (12%)
6. Fishing (8%)
7. Island hopping (8%)
8. Get close to nature (5%)

9. Water sports/boating (5%)
10. See famous/historic places (5%)
11. Shopping (5%)
12. Play golf (4%)
13. Try local food (4%)
14. Night life (2%)
15. See foreign lifestyles (1%)
16. Live with natives (1%)
17. Enjoy leisure (1%)

In sports, they associate Guam with:

1. Swimming (83%)
2. Golf (higher with higher income) (31%)
3. Water skiing (higher with lower income) (25%)

They show an interest in sports of:

Swimming	(36%)
Golf	(15%)
Water Skiing	(7%)
Surfing	(5%)
Boating	(4%)

Other Factors

Other aspects effect participation in recreation on Guam. These include travel time, income, leisure time, education, and the general state of the economy.

The high level of 0.6 automobiles per capital and 640 miles of paved roads make the vast majority of recreation facilities available to the population.

However, travel time and travel distance are expected to become a greater determinant on Guam due to the National Energy Policy and Conservation Act of 1975. This act set a goal of a 5% reduction in projected energy consumption by 1980. With very limited industry on Guam, the reduction must be taken in general electrical consumption and gasoline usage. Conservative figures project a necessary reduction of 30,000,000 vehicle miles spread among 101,000 vehicles in 1980, or approximately 300 miles per year per vehicle. Some assistance can be foreseen from a 50 vehicle bus fleet transit system anticipated to start prior to 1980 and expand to 60 buses prior to 1985. The bus system, however, is anticipated to be commuter and peak hour oriented, with island-wide headway times approaching two hour intervals.

Income of residents, like education, has an influence on demand for education in amount and kind. Lack of money for recreation limits the type of activities that can be enjoyed. Increasing income level will lead to increase in outdoor recreation demand and shifts to activities that require higher initial capital outlays, such as golf and boating. Per capita disposable income was \$1,813 in 1970 and \$3,100 in 1975. It is anticipated to be \$5,200 in 1980.

Over the last three years, the rate of inflation, as measured by the consumer price index, has been more rapid in Guam than in the United States. This has resulted largely from devaluation of the dollar and other special circumstances in international trade. These events are not likely to be repeated and projections are for prices to increase at the same rate as in the nation as a whole, at five to seven percent per year.

Civilian federal employees and their dependents on Guam have access to many military jurisdiction outdoor recreation facilities that are not available to the general civilian population and tourists. This is in addition to the military and their dependents who also have access to many military outdoor recreation facilities that are not available to the general civilian population and tourists, and therefore, must be considered in recreational planning on Guam.

Federal Employment on Guam

	Total Employment	Federal Employment	Federal Employment
1974	37,000	7,200	20%
1975	33,800	6,200	19%

Beyond income factors, the level of the standard of living is important. On Guam, various federal assistance programs increase the standards of living. Such programs involve food stamps, school lunch assistance, housing grants, etc. These programs reflect the number of low income residents, and may make available for recreational use funds that would have been required for necessities without such assistance. For example, the number of food stamp recipients is approximately 26,000 at present; and with the average household size of 2.4 in the 1970 census, we can assume this program is assisting 62,400 or 59% of the population of Guam.

Leisure time is of considerable importance. Of persons gainfully employed, it is anticipated, but not proven, that their number of hours of leisure time is less than their stateside counterparts because of longer working hours especially on Saturday and cultural obligations. However, this could be more than offset by the large number of unemployed, 13.3% in May, 1976 and the large number of children of school age-45% of total population in 1970.

Educational levels influence what activities one participates in, although most recreational activities require little formal education. Nevertheless, there seems to be a correlation between educational attainment of individuals and their interest in specific activities. Certain recreation activities relate to certain occupations which are related to certain education levels. The level of education attained by Guam residents is high and tending upward. In 1960, the median of school years completed for residents over 24 years old was 10.2 compared to the nation's median of 8.0. In 1970, these figures rose to 11.9 and 9.9 respectively.

The general state of the island's economy also influences most of the above mentioned factors and therefore affects participation in outdoor recreation, increasing participation in some activities, and decreasing participation in other activities. Several key factors need to be mentioned to explain the state of Guam's economy. These figures reflect that Guam is dependent on the economies of Japan and the United States. These external conditions are to a certain extent compounded on Guam most severely during the recent global recession which Guam is only now beginning to recover from.

A good indication of the private sector is the gross business receipt, which dropped in 1975 to \$607,704 from a high of \$630,810 in 1974. On the Government sector, increased demands for services is reflected in both the military and Government of Guam figures. Military expenditures were up to \$216,933,000 in 1975 from \$183,498,000 in 1974. The Government of Guam was forced into a severe financial position by the recession when expenditures exceeded revenue.

Other factors affected the citizens of the island. Employees on payrolls have not improved. For the last period that figures are available, April,

1976, 30,400 were employed on the island, a drop from 31,000 of the previous month of 400. Unemployment was still high in May, 1976, with unemployment at 13.3%.

On the other hand, the consumer price index of all items for the second quarter of the fiscal year stood at 143.4 up from 141.1 of the previous quarter. However, this is less than the high of 143.9 of the second quarter of fiscal year 1976. First quarter of fiscal year 1973 is 100.

Recreation items of the average family is calculated to be 1.92% of the families expenditures. The recreation price index has risen from 126.6 of the first quarter of fiscal year 1977 to 130.1 for the second quarter of fiscal year 1977, an increase of 11.7% as compared with the overall quarterly increase of the consumer price index of 1.6%.

However, the economy and recreation facilities of the island were delt a severe blow by Typhoon Pamela in May, 1976. Cost of repairs island-wide has been estimated at 200 to 400 million dollars.

Recreation facilities suffered along with the rest of the island. Damage to public and private recreation facilities was extensive. Just to the facilities operated by the Department of Parks and Recreation alone, damage amounted to \$503,088. However, the figures do not include an evaluation to unimproved parks, conservation or nature preserves. Other recreation facilities operated by the Department of Education suffered extensive damage also.

A brief breakdown of the \$503,088 reveals the extent of the damage. Eleven basketball courts suffered damage along with seventeen softball and baseball fields. Also, four tennis courts were damaged. Virtually, every public beach suffered either erosion or deposition of sand and silt by the

storm's action. Also, seven park buildings were severely destroyed along with most of the docks in the two public marinas. Similarly, the sole public swimming pool suffered damage. In all the improved parks, over 270 trees were destroyed which only after the passage of years will their replacement provide shade from the tropical sun.

D. OUTDOOR RECREATION INVENTORY

Outdoor recreation on Guam is administered by several agencies of both the Federal and Territorial Governments plus numerous private recreational ventures. Most of the facilities or programs complement each other although significant gaps occur due to fragmentation of outdoor recreation administration. Several federal agencies offer grant and assistance programs to the Territory of Guam. The Bureau of Outdoor Recreation offers financial and planning assistance to Guam for outdoor recreation planning, acquisition, and development. The Department of Health, Education, and Welfare supports several programs related to outdoor recreation through financial assistance to schools and assistance to public health and welfare programs. The National Park Service supports historic preservation on Guam through its Historic Preservation Grants-In-Aid program. Fisheries and wildlife programs are supported by grants from the Bureau of Sports Fisheries Wildlife. The Law Enforcement Assistance Administration supports youth centers operated by the Department of Parks and Recreation. The Economic Development Administration in 1977 funded \$4.9 million in park and recreation improvements.

The National Park Service has conducted several surveys of Guam and has issued preliminary plans for the Guam National Seashore and the War in the Pacific National Historic Park. Numerous areas on Guam in the Agat and Asan areas are already owned by the National Park Service in anticipation of legislation enabling creation of this park. However, the status of the proposed Guam National Seashore is doubtful because the National Park Service does not have an active proposal for this area. Rather, a Territorial Seashore should be created.

The military on Guam manages extensive recreation facilities and handles several recreation programs. The Navy's programs are administered by consolidated Recreation directly under Commander Naval Forces Marianas.

while the Air Force operates a Moral Welfare and Recreation Branch. However, not all their areas and facilities are open to the general public.

Government of Guam outdoor recreation is handled by various agencies. The Department of Education maintains extensive playgrounds and athletic fields in relation with schools. The Division of Fish and Wildlife of the Department of Agriculture manages the fisheries and wildlife aspects of outdoor recreation on Guam. Recreation is also handled by the village commissioners. However, the vast majority of the public recreation facilities on Guam are managed by the Department of Parks and Recreation which was formed in 1975. The Director of the department is also the Liaison Officer for the Bureau of Outdoor Recreation programs that relate to Guam.

Numerous private recreation outlets are found on Guam that are administered by churches, hotels, resort corporations, and private individuals. Usually the church facilities are free to users. However, the others are for hotel guests or on a fee basis.

A listing of current Guam outdoor recreation areas are listed on Table 2, Government of Guam facilities; Table 3, Private facilities; Table 4, Military facilities; and Table 5, Summary.

Publicly owned potential recreation areas are shown on Table 6. In this table, each area is ranked by several categories. First, each area is ranked by Bureau of Outdoor Recreation classification. These classes are:

- I. High density recreation areas
- II. General outdoor recreation areas
- III. Natural environment areas
- IV. Outstanding natural areas
- V. Primitive areas
- VI. Historic and cultural areas

TABLE 2: GOVERNMENT OF GUAM OUTDOOR RECREATION SUMMARY

Classifications to Support Activities

Overnight Facilities

Resort (#resorts, #rooms)	0/0
Campground (#campgrounds, #campsites)	0/0
Other (#areas, #sites)	0/0

Natural Land and Water Areas

Environmental areas (#areas, acreage)	8/529 acres
Hunting areas (#areas, acreage)	5/25,000 acres
Trails (#trails, miles)	5/35 miles
Fishing areas (#areas, acreage)	7/130 acres
Boating areas (#areas, #slips)	2/40 slips
Swimming (acres of beach)	105 acres of beach
Surfing (# of sites)	30
Scuba (# of sites, acreage)	6/2,000 acres, non-boat access areas

Manmade Areas

Baseball fields	10
Softball fields	11
Football fields/soccer	6
Playgrounds	26 on 6.2 acres
Basketball/volleyball courts	42/52
Tennis courts	10
Handball courts	2
Golf courses	0-18 hole courses
Swimming pools (#pools, sq.ft.)	1/4,340 square feet
Picnic areas (# areas, #units)	26/80 units
Skating rink	0

Historical Areas, Cultural Areas, and Scenic Wonders

Historic areas	19
Prehistorical areas	1
Cultural areas	1
Natural history	5

Social Recreation Areas and Facilities

Carnivals, amusement parks	2/5 operating weeks
Facilities for outdoor dances, concerts, plays	0
Sports arenas	0
Youth Centers	12/624 Operating weeks

TABLE 3: PRIVATE OUTDOOR RECREATION SUMMARY

Classifications to Support Activities Measurable Quantity

Overnight Capability

Resort (#resort, #rooms)	19/2,412
Campground (#campgrounds, #campsites)	2/10
Other (#areas, #sites)	0/0

Natural Land and Water Areas

Environmental areas (#areas, acreage)	0/0 acre
Hunting areas (#areas, acreage)	21/28,000 acres
Trails (#trails, miles)	6/22 miles
Fishing areas (#areas, acreage)	1/330 acres
Boating areas (#areas, #slips)	5/25 slips
Swimming (acres of beach)	71 acres of beach
Surfing (# of sites)	0
Scuba (# of sites, acreage)	0/0 acres

Manmade Areas

Baseball fields	0
Softball fields	0
Football fields/soccer	0
Playgrounds	1 on 1 acre
Basketball/volleyball courts	6/9
Tennis courts	12
Handball courts	0
Golf courses	2-18 hole courses
Swimming pools (#pools, sq.ft.)	11/13,750 square feet
Picnic areas (#areas, #units)	10/80 units
Skating rink	1

Historical Areas, Cultural Areas, and Scenic Wonders

Historical areas	3
Prehistorical areas	0
Cultural areas	0
Natural history areas	0

Social Recreation Areas and Facilities

Carnivals, amusement parks	1/10 operating weeks
Facilities for outdoor dances, concert, plays	7/365 Operating weeks
Sports arenas	1
Youth Centers	0

TABLE 4: MILITARY OUTDOOR RECREATION SUMMARY

Classification to Support Activities

Overnight Capability

Resort (#resorts, #rooms)	0/0
Campground (#campgrounds, #campsites)	1/3
Other (#areas, #sites)	0/0

Natural Land and Water Areas

Environmental areas (#areas, acreage)	13/23,270 acres
Hunting areas (#areas, acreage)	42/14,900 acres
Trails (#trails, miles)	10/46 miles
Fishing areas (#areas, acreage)	3/150 acres
Boating areas (#areas, #slips)	2/10 slips
Swimming (acres of beach)	67 acres
Surfing (# of sites)	8
Scuba (# of sites, acreage)	3/2,500 acres

Manmade Areas

Baseball fields	9
Softball fields	19
Football fields	6
Playgrounds	84 on 32.5 acres
Basketball/volleyball courts	16/13
Tennis courts	33
Handball courts	11
Golf Courses	1.5-18 hole courses
Swimming pools (#pools, sq.ft.)	9/30,000 square feet
Picnic areas (#areas, #units)	9/181 units
Skating rink	0

Historical Areas, Cultural Areas, and Scenic Wonders

Historical areas	3
Prehistorical areas	1
Cultural areas	0
Natural History areas	1

Social Recreation Areas and Facilities

Carnivals, amusements parks	0
Facilities for outdoor dances, concerts, plays	4/208 Operating weeks
Sports arenas	1/52 Operating weeks
Youth Centers	0

TABLE 5: GUAM OUTDOOR RECREATION SUMMARY

Classification to Support Activities

Overnight Capability

Resort (#resort, #rooms)	19/2,412
Campground (#campgrounds, #campsite)	2/10
Other (#areas, #sites)	0/0

Natural Land and Water Areas

Environmental areas (#areas, acreage)	9/23,799 acres
Hunting areas (#areas, acreage)	30/67,900 acres
Trails (#trails, mileage)	21/103 miles
Fishing areas (#areas, acreage)	11/610 acres
Boating areas (#areas, #slips)	9/75 slips
Swimming (Acres of beach)	413 acres of beach
Surfing (# of sites)	38
Scuba (# of sites, acreage)	9/4,500 acres

Manmade Areas

Baseball fields	19
Softball fields	30
Football fields	12
Playgrounds	111 on 30.7 acres
Basketball/volleyball courts	64/74
Tennis courts	55
Handball courts	13
Golf courses	3.5-18 holes courses
Swimming pools (#pools, sq.ft.)	21/48,090 square feet
Picnic areas (#areas, #units)	45/341 units
Skating rink	1

Historical Areas, Cultural Areas, and Scenic Wonders

Historical areas	25
Prehistorical areas	2
Cultural areas	1
Natural history areas	6

Social Recreation Areas and Facilities

Carnivals, amusement parks	3/15 Operating weeks
Facilities for outdoor dances, concerts, plays	11/573 Operating weeks
Sports arenas	2/52 Operating weeks
Youth Centers	12/624 Operating weeks

TABLE 6: PUBLIC OWNED POTENTIAL RECREATION AREAS

Name & Location Beaches & Marinas	Ownership	BOR Class	Natural Beauty	Potential Uses								Evaluation	
				Historic Sites	Scenic Area	Swimming	Picnicking	Camping	Hiking or Riding	Nature Study	Marina		Competitive Sports
Haputo Beach	Military	V	1			3	1	1	1	2		A	
Hilaan Beach	Military	III	2			1	2	2	2	2		B	
Tanguissan Point North & South	Military	III	1			2	1	3	3	3			
Ypao Bay	Territory	II	2			1	1				1	B	
Agana Bay	Territory	I	3	3		1	2				1	2	B
Glass Breakwater	Military	II	2			3	1						B
Piti Channel	Military	II	2			2	3	3	1				C
Agat Bay	Territory	II	3			2	2	3	2	1			C
Bangi Point North & South	Territory	VI	2	1		2	2	2					B
Sella Bay	Territory	V	2	1		3	1	2	1	1			B
Cetti Bay	Territory	V	1			3	1	1	1	1			A
Fouha Bay	Territory	III	2	1		3	2	2	2	1			A
Umatac Bay	Territory	II	2	1		2	2			2	2		B
Cocos Island	Military	III	1			1	1	1	3	2			B
Merizo Lagoon	Territory	II	2	3		2	2		3	1			A
Dealey Beach	Territory	II	3			2	2	3					B
Taogam Beach	Territory	III	1				1	3	3				C
INLAND WATER AREAS													
Tarzan Falls	Territory	III	1			2	1	2	3	3			B
Tarzan Swimming Hole	Territory	III	2			2	2	3	3				C

TABLE 6: PUBLIC OWNED POTENTIAL RECREATION AREAS
(cont.)

Name & Location	Ownership	BOR Class	Natural Beauty	Potential Uses								Evaluation	
				Historic Sites	Scenic Area	Swimming	Picnicking	Camping	Hiking or Riding	Nature Study	Marina		Competitive Sports
Merizo Water Hole	Territory	III	2		3	3							C
Spanish Dikes	Territory	V	3	1		2							B
Asan Springs	Territory		3		1	2							C
Fena Valley Reservoir	Territory	II	1		2	2	1	1	2	3			A
Masso River Dam	Territory	III	3			3	3						C
Asan Spring	Territory	II	3										C
SCENIC OVERLOOKS													
Ritidian Point	Territory	III	1			1	3	3	3				B
Puntan dos Amantes	Territory	IV	1	2		1	3	3					A
Alupan Island	Territory	III	2		2	2	3						C
Pinai Point	Territory	V	1			1	3	1	2				B
Merizo School	Territory	II	1			1	2						C
Toagam Point	Territory	II	1			2	2	3					C
Campananua Point	Territory	III	2			3	2						C
Janum Point	Territory	III	2			3	2						C
Anao Point	Territory	II	1			1	2	1	3				B
Pati Point	Territory	V	1			1	2	1	3				B
Mergagan Point	Territory	V	1			2	2	1	3				B

TABLE 6: PUBLIC OWNED POTENTIAL RECREATION AREAS
(cont.)

Name & Location	Ownership	BOR Class	Natural Beauty	Potential Uses								Evaluation	
				Historic Sites	Scenic Area	Swimming	Picnicking	Camping	Hiking or Riding	Nature Study	Marina		Competitive Sports
Barrigada Hill	Territory	II	2				2	3					C
SCENIC HIGHWAYS													
Agat-Umatac Highway	Territory	IV	1				1						A
Merizo-Inarajan Highway	Territory	III	1				1						A
Talofoto to Ylig Bay Highway		III	2				2						B
Tamuning to Piti Highway		II	3				3						C
Agat Village Nimitz Beach	Territory	II	2				2						B
Cross Island Route 17	Territory	III	1				2						B
Nimitz Hill Mt. Tenjo	Territory	III	2				3						C
SCENIC TRAILS													
Mt. Lamlam to Inarajan	Territory	V	1				2	1	1	1	1		A
Nimitz Beach to Umatac	Territory	V	1	1			2	2	1	1	1		A
Campanaya Pt. to Janum Pt.	Territory	V	2				2	2	1	2			B
Nomna Beach to Asiga Beach	Territory	V	2	3			3	2	2	1	2		

TABLE 6: PUBLIC OWNED POTENTIAL RECREATION AREAS
(cont.)

Name & Location	Ownership	BOR Class	Natural Beauty	Potential Uses								Evaluation
				Historic Sites	Scenic Area	Swimming	Picnicking	Camping	Hiking or Riding	Nature Study	Marina	
CAVES SITES												
Talofofu Caves	Territory	III	1		2	3	2	2			B	
Marbo Cave	Territory	III	2		2	2	2	1	2		B	
Ritidian Caves	Territory	III	2		2			2			C	
Asiga Cave	Territory	III	3		2	2		2			C	
WILDERNESS AREA												
Southern Mountain Area	Territory and Military	V	1		2	1	1	1			A	
Jalailai Forest	Territory	V	1	2	3	2	1	1			A	
Anao Pt. to Toagam Pt.	Territory	V	1			1	1	1			B	

Next, each area is ranked on its merits of natural beauty on a scale of one to three. One being the highest ranking and three being the lowest. Third is several categories of potential uses. Each of these is also ranked on a one to three scale. Again, one has the highest potential and three the lowest potential. No listing indicates no potential.

Finally, there is an overall evaluation. This is ranked on a scale of A, B, and C. A has the highest potentials for outdoor recreation. B has lesser potential while C has the lowest potential.

Many of the existing and potential outdoor recreation sites can readily be improved without impairing the scenic, recreation, ecological, and other significant values of the area. These values can be enhanced by the proper development of the areas in terms of pollution control, revegetation, vehicle control, and controlling human access. All these aspects are of primary concern in the action program. In addition, virtually all existing facilities have suffered damage from Typhoon Pamela and need repair. A considerable amount of typhoon repairs is being funded by the Federal Disaster Assistance Administration.

As of October 1, 1977, Guam had forty-four sites listed on the National Register of Historic Places. These sites are shown in Table 7. Additional sites are continually being nominated for inclusion as they are determined to be eligible. However, Guam does not presently have any sites designated as National Historic Landmarks. Four sites on Guam are designated as National Landmarks. These are Puntan dos Amantes, Dededo; Facpi Point, Umatac; Fouha Point, Umatac; and Mount Lamlam, Umatac.

Currently, Guam has one trail that possibly merits inclusion within a nationwide trail system. This trail, the Mt. Lamlam to Inarajan trail of

TABLE 7: GUAM SITES ON THE NATIONAL REGISTER OF HISTORIC PLACES

Pagat Site, Yigo	Nomna Bay, Inarajan
Plaza de Espana, Agana	Uruno Site, Dededo
Fort San Jose, Umatac	Uruno Beach Site, Dededo
Memorial Beach Park, Asan	Jinapsan Site, Yigo
Fort Santa Agueda, Agana	Talofoyo River Valley Site, Inarajan
San Dionisio Church Ruins, Umatac	North Inarajan Site
Fort Santo Angel, Umatac	South Talofoyo Site
Agana Spanish Bridge, Agana	Hill 49, Agat
Taleyfac Spanish Bridge, Agat	Agat Invasion Beach
Merizo Conbento	Matgue Valley, Asan-Piti
Taelayag Spanish Bridge, Agat	SMS Cormoran, Apra Harbor
Fort Soledad, Umatac	Merizo Bell Tower
Sella Bay, Umatac	Piti Coastal Defense Guns
Spanish Dikes, Agana	Orote Air Field, Naval Station
Fafai Beach, Tumon	Asan Ridge, Battle Area
Gadao's Cave, Inarajan	Achugao Bay, Umatac
Haputo Site, Dededo	South Finegayan Latte Stone Park
Cetti Bay, Umatac	Padre San Vitores Site, Tamuning
Fouha Bay, Umatac	Agaga Beach, Umatac
Mochom Site, Mangilao	Mataguac Hill Command Post, Yigo
Inarajan Ridge Site	Asquiroga Cave, Talofoyo
West Atate Site, Inarajan	Dungca's Beach Defense Guns, Tamuning

seven miles in length, is neither administered nor maintained as a trail by the Government of Guam. It crosses territory, military, and private land, but is used for outdoor recreation and has great potential. Further study of this trail is anticipated.

The possibility exists that certain streams on Guam could be included in a system of wild or scenic rivers. Portions of the Pago, Ylig, and Tafofofo Rivers still retain their natural state unaltered by man and should be studied for possible scenic or wild river status. Guam has several areas established as natural preserves that protect examples of the native geology and ecology. However, not all are adequately protected and more representative areas are needed. The current areas are shown on Table 8.

TABLE 8: CONSERVATION OR NATURE PRESERVES

Ypiga, Dededo, 16 acres

Interior limestone forest preserve.

Anao, Yigo, 96 acres

Limestone plateau with limestone forest vegetation and natural habitat for deer and pig, also turtle and lobster along the reef in the area.

Agana Spring, Agana, 25 acres

Freshwater pond in a limestone basin. Freshwater wildlife reserve.

Limestone Forest, Mangilao, 20.7 acres

A limestone plateau area with a climax limestone forest. This is natural habitat for existing Guam rail.

Anae Island, Agat, 2 acres

Offshore virgin reef island.

Cotal (Tarzan Falls), Yona, 104 acres

Volcanic upland area with major streams. This includes ravine and savannah vegetation communities, natural habitat for existing deer and pig.

Chalan Palii-Mt. Schroeder (Mt. Bolanos), Umatac, 244 acres

Upland of volcanic conglomerate containing fragments of limestone. Includes savannah and ravine vegetation communities, natural habitat for existing deer, carabao, and pig.

Cocos Island, Merizo, 21.7 acres

A portion of a barrier reef island with white, coral limestone, and a sand beach.

E. OUTDOOR RECREATION DEMAND

It is necessary to estimate outdoor recreation demand to permit a comparison of demand for outdoor recreation to the current supply of outdoor recreation facilities. The amount of demand that is not satisfied by supply is known as deficiencies or unsatisfied demand. Once the outdoor recreation deficiencies are identified, policies and facilities can be proposed to meet the deficiencies.

In order to accurately gauge demand for outdoor recreation areas and facilities on Guam, local standards were established. These standards are based on the standards developed by the National Recreation and Park Association in their publication National Park Recreation and Open Space Standards or standards in the 1967 Delaware Outdoor Recreation Plan. Where these were not available, standards were calculated using Hawaii's Outdoor Recreation Plan. These are shown on Table 9. However, in order to reflect certain characteristics of Guam, adjustments were made for several factors. First, where youth is a major factor in participation, the activity rate was adjusted since Guam's under 24 years of age population is 16% higher than the nation. Where income is a major factor in participation, the activity rate was adjusted to reflect Guam's per capita disposable income being 45% below the national average. Where sex is a major determinate, the activity rate was adjusted for Guam's 5% fewer females or 5% more males. Where education is a factor, these were adjusted for Guam's education level of 20% higher than the nation. The climate of Guam is considerably more favorable to outdoor recreation than much of the mainland and this must be accounted for where appropriate. Some activities like fishing might not be effected. Where appropriate, this has been accounted for by a 300%

TABLE 9: NATIONAL AND GUAM STANDARDS

<u>Activities</u>	<u>National Standard</u>	<u>Guam Standard</u>
<u>Overnight Facilities</u>		
Resort (#resorts, #rooms)	N/A	N/A
Campground (#campgrounds, #campsites)	1/2,125	1/2,500
Other (#areas, #sites)	N/A	N/A
<u>Natural Land and Water Areas</u>		
Environmental areas (#areas, acreage)	N/A	N/A
Hunting areas (#areas, acreage)	N/A	N/A
Trails (#trails, miles)	1 mile/400	1 mile/1,000
Fishing areas (#areas, acreage)	N/A	N/A
Boating areas (#areas, #slips)	1/370	1/400
Swimming (acres of beach)	1/909	1/750
Surfing (#of sites)	N/A	N/A
Scuba (# of sites, acreage)	N/A	N/A
<u>Manmade Areas</u>		
Baseball fields	1/2,250	1/2,370
Softball fields	1/2,250	1/2,370
Football fields/Soccer	1/10,000	1/10,530
Playgrounds	1/2,500	1/2,100
Basketball/volleyball courts	1/500	1/530
Tennis courts	1/2,000	1/2,100
Handball courts	1/18,200	1/20,775
Golf courses (18 holes)	1/25,000	1/25,000
Swimming pools (#pools, sq.ft.)	1/20,000	1/20,000
Picnic areas (# areas, #units)	1/2,000	1/500
Skating rink	1/30,000	1/30,000
<u>Historic Areas, Cultural Areas, and Scenic Wonders</u>		
Historical areas	N/A	N/A
Prehistorical areas	N/A	N/A
Cultural areas	1/community	1/island
Natural history areas	N/A	N/A
<u>Social Recreation Areas and Facilities</u>		
Carnivals, amusement parks	1/community	1/island
Facilities for outdoor dances, concerts, plays	1/community	1/island
Youth centers	1/10,000	1/village
Sports arenas	1/community	1/island

increase, to account for year-round summer climate, minus a 50% decrease, to account for nine months of 5/7th school days. This results in a net increased of 100%.

Activity rates for the visitors to Guam are based on the anticipated tourism shown on the tourism analysis section of this report and also reflects the activity days generated in activities deemed significant by the ORRC Study Report II. These tourism activity rates which are shown on Table 10 have been incorporated into Table 9.

TABLE 10: TOURISM OUTDOOR RECREATION DEMAND

	1980	1985	1990
Tourist (15% growth)	528,000	740,000	817,000
Activity			
Swimming	1,056,000	1,480,000	1,634,000
Fishing	153,120	214,600	236,930
Boating	300,960	421,800	465,690
Golf	58,080	81,400	89,870
Water Skiing	31,680	44,400	49,020
Tennis	15,840	22,200	24,510
Horseback Riding	15,840	22,200	24,510
Hunting	15,840	22,200	24,510
Hiking	15,840	22,200	24,510

F. POLICY, STANDARDS, NEEDS, AND RECOMMENDATIONS

Anticipated outdoor recreation opportunities will be the responsibility of the Government of Guam as it has been in the past. However, certain segments of meeting the need for outdoor recreation facilities will be met by other bodies either public or private. The military will continue to furnish recreation facilities for those who qualify. Certain specific activities such as resorts, private school recreation activities, and private facilities managed for profit such as the new greyhound dog racing facility will fill a portion of the need. In addition, the National Park Service could fulfill portions of the demand if their unit is established.

In the 1976 islandwide goals survey conducted by the Bureau of Planning, out of 17 goals, the natural resource, recreation, and cultural heritage goals rated surprisingly high. The recreation goal stated, "Develop Guam's recreation resources to satisfy the desires of the residents and visitors, and to preserve the island's scenic and historic sites, natural areas, and beaches". This goal rated an 89% agreement and tied with three others for second in importance. The natural resources goal stated, "Develop Guam's natural resources according to their best uses and protect those areas, both natural and man-made, which are critical to our health, safety, and livelihood". This goal also rated an 89% agreement and tied with three others for second in importance. The cultural heritage goal states to "Preserve and promote Guam's historic and archaeological heritage and varied cultural character so that future generations may understand their past as well as their development as a society". This goal rated an 88% agreement and tied with one other as third in importance.

All these island goals are being acted upon by the Bureau of Planning. This agency of the Government of Guam was created by Public Law 12-200 on January 19, 1977, to organize comprehensive development planning for the island. Several components of the Guam Comprehensive Development Plan have been completed and implemented including the Historic Preservation Plan. Other elements being formulated include a land use plan, growth policy, transportation plan, agriculture plan, and overall economic development plan. Therefore, comprehensive planning for Guam's future is being achieved.

With this background of general island goals, the more specific related outdoor recreation general guidelines will be followed by the Government of Guam as follows:

1. Provide a full range of active and passive recreation opportunities for the people of Guam and the visitors to Guam. The provision of an adequate quantity and variety of facilities to serve the special needs and interests of each segment and age group of Guam's population including all permanent residents, military personnel and tourists is demanded.
2. Preserve, protect and insure the wise use of Guam's limited scenic areas, historic features, beaches, rivers, natural resources, and undisturbed areas of natural beauty. All of these assets have great social value for present and future generations and economic value as tourist attractions. There is plenty of land suitable for urban development, so there is no need to destroy the island's great resources of natural beauty. Foresighted planning and action programs can preserve the outstanding sites and make less critical public lands available for development. Resources preservation is urgent because, once encroached upon, these resources can seldom be recovered.

3. Preserve and develop parks, open space, and conservation areas through coordinated Government of Guam, Federal, and private efforts.
4. Encourage orderly population growth and patterns of urban development that are compatible with Guam's resources.
5. Insure that communities provide a sense of identity and aesthetic and social satisfaction compatible with the island's resources and natural environment through effective land use coordination and planning.
6. Require that all planning include conservation of the natural resources and opportunities for recreation.
7. Encourage the development and expansion of industries that are environmentally and socially compatible. This specifically emphasizes encouragement of the tourist industry through recreational opportunities; provision of tourist facilities, such as hotels and restaurants; and involvement of military personnel in the local economy through off-base social and recreation activities.
8. Provide opportunities for citizens to lead useful, meaningful, and productive lives.
9. Include public participation in the outdoor recreation planning process.

In order to accomplish these goals, numerous responsibilities of other agencies that effect outdoor recreation will be required. These agencies and their related duties are:

1. Village Commissioners - coordinate village level recreation activities.
2. Bureau of Planning - islandwide master planning and coastal zone management functions.
3. Parks and Recreation - management and planning of parks and recreation areas, Bureau of Outdoor Recreation functions, historic preservation, and recreation activities.

4. Public Works - administer capital improvements in parks.
5. Land Management - administer public land and acquire land for outdoor recreation.
6. Guam Housing and Urban Renewal Authority - Community Development Program and Low Cost Housing.
7. Guam Environmental Protection Agency - enforcement of environmental quality laws.
8. Education - school related recreation activities.
9. Agriculture - manage conservation preserves and fish and wildlife.

With this appraisal of the different outdoor recreation functions by various Government of Guam, Federal, and private agencies, it is next wise to summarize the anticipated need for future outdoor recreation need and facilities. Table 11 summarizes the need for facilities which was derived from a summary of the need analysis. This in turn, by comparison with the existing outdoor recreation facilities as given in Table 4, yields the need for additional recreation facilities that are given on Table 12.

It should be noted at this point that certain categories in the need analysis did not have applicable standards to judge the island's needs by. On these categories, the methodology utilized in the 1966 Outdoor Recreation on Guam was utilized taking into consideration the changing socio-economic conditions of the island.

The needs analysis given in Table 12 reflects the needs demonstrated in the methodology utilized. It does not take into consideration the limits placed on Guam by our land area of 212 square miles nor funding limits. Similar in nature is the undefinable nature of the scuba and fishing areas. This is because these areas are the open sea surrounding Guam and are essentially undefinable.

TABLE 11: GUAM RECREATION FACILITY NEEDS

<u>Facilities/Resources to Support Activities</u>	<u>Need</u>		
	1980	1985	1990
<u>Overnight Facilities</u>			
Resort (#rooms)	Needs	Undefinable	
Campground (# campsites)	51	60	72
Other (#sites)	Needs	Undefinable	
<u>Natural Land and Water Areas</u>			
Environmental areas (Acreage)	13,130	18,000	20,000
Hunting areas (acreage)	847	1,000	1,190
Trails (mileage)	127	151	179
Fishing areas (Acreage)	520	640	760
Boating areas (slips)	317	378	448
Swimming (acres of beach)	169	201	239
Surfing (# of sites)	Needs	Undefinable	
Scuba	Needs	Undefinable	
<u>Manmade Areas</u>			
Baseball fields	54	64	76
Softball fields	54	64	76
Football fields/soccer	12	14	17
Playgrounds	60	72	82
Basketball/volleyball courts	240	285	238
Tennis courts	60	72	85
Handball courts	6	7	9
Golf courses (18 holes)	5	6	7
Swimming pools	6	8	9
Picnic areas (# units)	254	302	358
Skating rinks	4	5	6
<u>Historic Areas, Cultural Areas, and Scenic Wonders</u>			
Historical areas	Needs	Undefinable	
Prehistorical areas	Needs	Undefinable	
Cultural areas	1	1	1
Natural history areas	Needs	Undefinable	
<u>Social Recreation Areas and Facilities</u>			
Carnivals, amusement parks	1	1	1
Facilities for outdoor dances, concerts, plays	1	1	1
Sports arenas	1	1	1
Youth centers	19	19	19

TABLE 12: NEED FOR ADDITIONAL OUTDOOR RECREATION FACILITIES

<u>Facilities/Resources to Support Activities</u>	<u>Need</u>		
	1980	1985	1990
<u>Overnight Facilities</u>			
Resort (#rooms)	Needs	Undefinable	
Campground (#campsites)	41	50	62
Other (#sites)	Needs	Undefinable	
<u>Natural Land and Water Areas</u>			
Environmental areas (acreage)	0	0	0
Hunting areas (acreage)	0	0	0
Trails (mileage)	24	48	76
Fishing areas (acreage)	0	0	150
Boating areas (slips)	242	303	373
Swimming (acres of beach)	0	0	35
Surfing (# of sites)	Needs	Undefinable	
Scuba (acreage)	Needs	Undefinable	
<u>Manmade Areas</u>			
Baseball fields	35	45	57
Softball fields	24	34	46
Football fields/soccer	0	2	5
Playgrounds	0	0	0
Basketball/volleyball courts	102	147	100
Tennis courts	5	17	30
Handball courts	0	0	0
Golf courses (18 holes)	2.5	3.5	4.5
Swimming pools	0	0	0
Picnic areas (#units)	0	0	0
Skating rinks	3	4	5
<u>Historic Areas, Cultural Areas, and Scenic Wonders</u>			
Historical areas	Needs	Undefinable	
Prehistorical areas	Needs	Undefinable	
Cultural areas	0	0	0
Natural history areas	Needs	Undefinable	
<u>Social Recreation Areas and Facilities</u>			
Carnivals, amusement parks	0	0	0
Facilities for outdoor dances, concerts, plays	0	0	0
Sports arenas	0	0	0
Youth centers	7	7	7

In addition, the needs evaluation does not take into consideration the facts that most of the private and military facilities and areas are not open to the public such as beaches and the only sports arena on the island. Therefore, if the facilities cannot be open to the general public, additional facilities are needed to compensate for these. Also, the needs are not reflective of areas such as beaches that are government owned, but not developed. Although the beach acreage appears adequate until 1990, a considerable portion of that total supply needs to be developed.

Within the general coordination of the Department of Parks and Recreation, it is anticipated that the deficiencies will be met by various agencies, both public and private. Campground needs could be met by a combination of private, military, and Government Guam efforts. Trail need can be met by the efforts of the military, Department of Parks and Recreation, and Land Management. Needed boating slips can be constructed by the military, private groups, and the Department of Parks and Recreation. Unfortunately, additional needed surfing footage cannot be met since all surfing areas are being used and new areas cannot feasibly be created.

The man-made areas would be developed by several agencies. The vast majority would be constructed by the Departments of Parks and Recreation and Education. However, the Guam Housing and Urban Renewal Authority would build some in housing areas along with private developers. Additional golf courses will be implemented by the private sector. In addition, the military will build some facilities in these categories.

Historical areas, cultural areas, and scenic wonders will be developed by several agencies and private groups, but under the coordination of the Department of Parks and Recreation. However, facilities for social recreation will be basically developed by the Department of Parks and Recreation and the private sector.

G. IMPLEMENTATION PROGRAM

In order to implement the program to meet the needs expressed and to protect the environment, numerous specific actions must be implemented. Each of these is outlined below.

Legislation

Establish the Guam Territorial Seashore to protect the natural and historic resources of southwest Guam.

Preservation of wilderness areas and habitat of rare species.

Legally establish all units of the territorial park system.
Laws regulating the taking of all coral.

Planning

Plan for high need regional activities on an islandwide basis such as golf, hiking, boating, sports center, and cultural activities.

Preserve and provide access to recreation areas both on the coastline and inland.

Utilize the needs indicated to adjust priorities of recreation facilities.

Continue the inventory of historic and recreation areas.

Plan to minimize conflicting recreation activities.

Utilize alternative methods such as scenic easements to preserve features.

Technical and Financial Assistance

Maximize the utilization of funds from Federal and private sources for recreation.

Develop a resource base of the latest information on management, construction, and planning for outdoor recreation, historic sites, and resource preservation.

Research and Education

Develop and implement a methodology to continually be appraised of the populations needs and trends of recreation.

Institute a public education program of the value of the island resources and recreation activities that are harmful to these resources.

Institute ties with the University of Guam to expand the recreation knowledge of Guam.

Implement research and feasibility studies for numerous recreation activities.

Director's Programs

Repair all typhoon damaged recreation facilities and recreation areas.

Implement construction of long-needed recreation facilities.

Purchase critically needed real estate to round out park and recreation areas.

Implement an effective preventative maintenance program and modify facilities to prevent further deterioration of parks.

Develop programs to utilize public facilities such as schools, highways, and other government property for maximum outdoors recreation use.

Develop facilities to meet the needs expressed in this report.

Erosion control in outdoor recreation areas.

Intergovernmental Coordination

Coordinate with the military for planning of new facilities, activities, and recreation of areas for outdoor recreation.

Implement public use of military lands for recreation.

Coordinate and establish a War in the Pacific National Historical Park on Guam.

Insure coordination of all Government of Guam agencies for outdoor recreation.

Establish liaison with private groups interested in providing recreation opportunities on Guam.

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