

FINAL REPORT

RECREATIONAL COMPONENT  
OF THE  
NEW JERSEY PINELANDS COMPREHENSIVE MANAGEMENT PLAN

PREPARED BY:  
COMMITTA FREDERICK ASSOCIATES  
ENVIRONMENTAL PLANNING AND DESIGN CONSULTANTS  
WEST CHESTER, PENNSYLVANIA

FOR:  
THE NEW JERSEY PINELANDS COMMISSION  
NEW LISBON, NEW JERSEY

SEPTEMBER 1980

FINAL REPORT

RECREATIONAL COMPONENT  
OF THE  
NEW JERSEY PINELANDS COMPREHENSIVE MANAGEMENT PLAN

PREPARED BY:  
COMMITTA FREDERICK ASSOCIATES  
ENVIRONMENTAL PLANNING AND DESIGN CONSULTANTS  
WEST CHESTER, PENNSYLVANIA

FOR:  
THE NEW JERSEY PINELANDS COMMISSION  
NEW LISBON, NEW JERSEY

SEPTEMBER 1980

## TABLE OF CONTENTS

	Page
Introduction	i
Summary Report:	
Background/Data Inventory	1
User/Uses Profile	3
The Provision of Recreational Opportunities in the Pinelands	6
Identification of Relevant Issues	8
Recreational Resources Environmental Analysis	9
Plan Recommendations	12
Appendices:	
Appendix A: Data Inventory	A.1
Appendix B: Characteristics of Pinelands Recreational Users and Uses	B.1
Appendix C: The Provision of Recreational Opportunities in the Pinelands	C.1
Appendix D: Public Participation	D.1
Appendix E: Identification of Issues Associated with Recreational Use of the Pinelands	E.1
Appendix F: Impact Assessment	F.1
Appendix G: Environmental Analysis	G.1
Appendix H: Performance Regulations	H.1
Appendix I: Bibliography	I.1

## INTRODUCTION

---

This study is concerned with an evaluation of existing recreational land use and the preparation of a plan for the future recreational use of the New Jersey Pinelands. As such, it addresses what may be regarded as the most appropriate use of this ecologically unique, relatively undeveloped area of southern New Jersey. More precisely, the Pinelands, for the purposes of this study, is defined by the Federally legislated Pinelands National Reserve, which measures 1,082,800 acres. (The study area also includes two small sections of the Critical Area of the Pinelands which lie outside the National Reserve.) The study area is, therefore, said to measure approximately 1.1 million acres. It is depicted in the Map Volume of the New Jersey Pinelands Draft Comprehensive Management Plan as Plate 1, which has been reproduced, herein, as Figure 1.

The magnitude of the undeveloped character of the Pinelands is especially unique to New Jersey and may be likened to other areas of the northeastern United States such as The Adirondack Region of New York State, Northcentral Pennsylvania, Vermont's Northeast Kingdom, New Hampshire's North Country and the North Maine Woods. In size, it may be likened nationally to the Glen Canyon National Recreation Area in Utah, Everglades National Park in Florida, Glacier National Park in Montana and, perhaps most notably, Grand Canyon National Park in Arizona. It differs, however, from all of these areas; and, its uniqueness may best be appreciated in terms of its proximity to urban population centers, being situated in the heart of the Boston-Washington Megalopolis. In a more proximal sense, it is unique in terms of its relationship to the development pressures represented by an expanding metropolitan Philadelphia Camden area and the recently 'development-crazed' Atlantic City casino environs. The proximity of these growing urban areas is, nonetheless, of a composite recreational resource capable of serving its own inhabitants, the populations of these expanding areas, and other residents of the northeastern United States.

This study is only concerned with those recreational activities which are, although not unique, particularly dependent upon the overall uniqueness of the Pinelands environment and most suited to the appreciation, enjoyment and utilization of the area's abundant recreational resources. As such, it is not concerned, at all, with recreational activities associated with playfields, playgrounds, tot-lots, theme parks, golf courses and country clubs, etc. Moreover, no attempt is made to define corridors areas of concern relative to the provision of de facto open space for conservation and or preservation purposes. The principal focus of concern is embodied in the following list of recreational activities:

hunting (deer, small game)	photography
fishing (saltwater, freshwater, shellfishing, crabbing)	bicycling
horsebackriding	motorcycling
canoeing	ORVS
camping (motorized and non-motorized; wilderness, family and organized group)	hiking
picnicking	cross-country skiing
nature study (birding, botanizing)	driving for pleasure
	sightseeing
	swimming
	boating

(Trapping is also a recreational activity pursued in the Pinelands. It has not been included as a principle activity due to its relatively small number of parti-



# NEW JERSEY PINELANDS

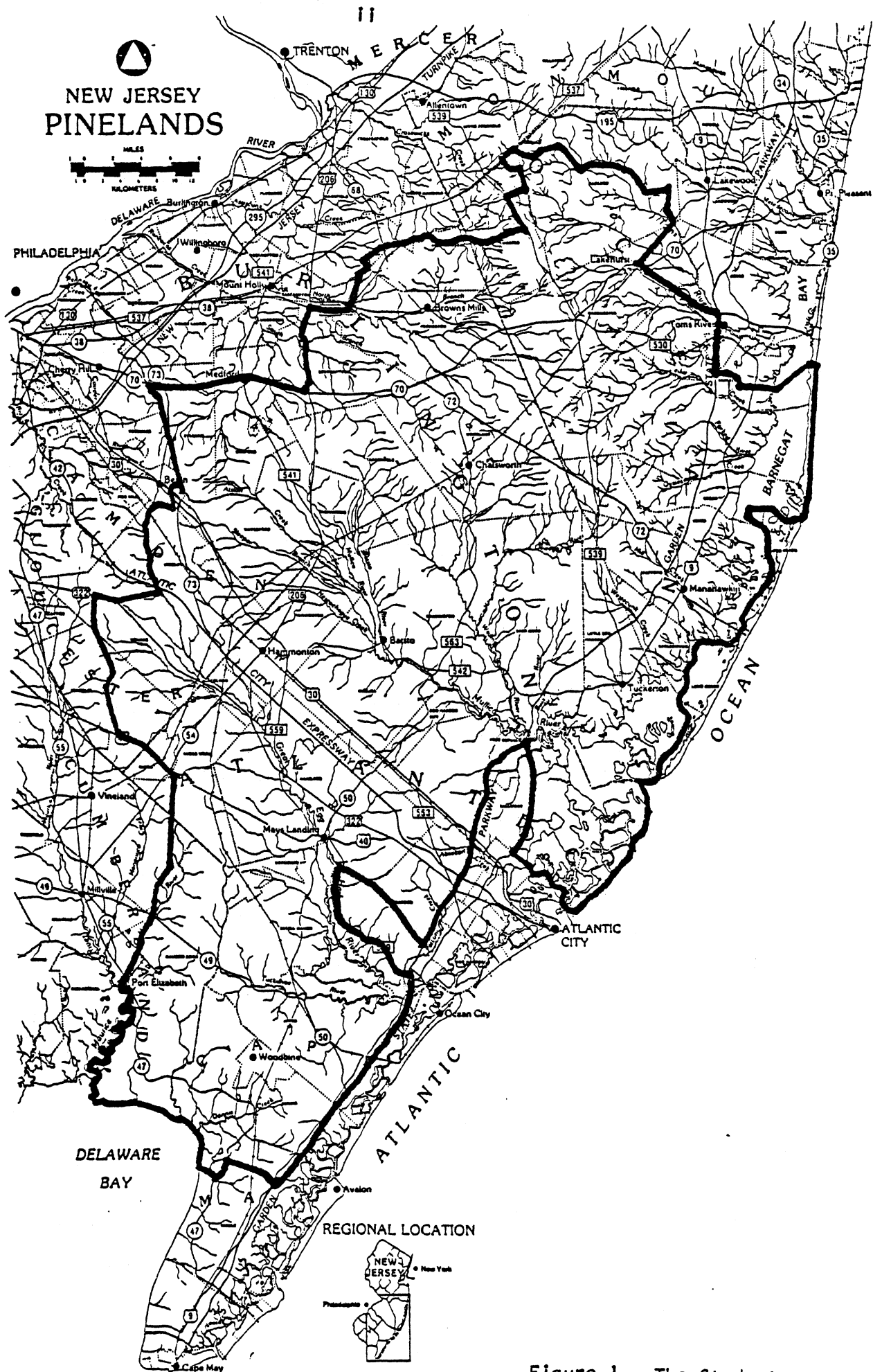


Figure 1 - The Study Area

cipants and the fact that it is, unlike any other activity, pursued for commercial value. However, it is estimated by the Division of Fish, Game, and Wildlife that 50% to 70% of those who participate do so primarily for recreational value. Most trapping occurs along Pineland's streams, where an estimated 93,500 muskrats are harvested annually during a trapping season which extends from November through March.) It can be observed from the preceding listing that recreational use of the Pinelands relates to every area within the overall landscape; i.e. the shore, the bay, the uplands, the rivers, etc. This mimicks the relationship that exists between other forms of land use and the Pinelands landscape; particularly use by native Pinelands residents, 'Pineys', who may be seen at varying times of the year, conducting their lives and livelihood throughout the entire Pinelands. They hunt the upland and trap the lowland, gather berries in the fields and ornamental plant material in the forest, mine cedar and harvest cranberries in the bogs, and engage in limited boat building along the navigable waterways. Similarly, recreation activity is involved with hiking, horsebackriding and camping the the upland and lowland forests; bicycling and driving for pleasure along the roads; canoeing adjacent to the bogs and along the narrow and tortuous rivers; fishing and shell-fishing in the bay and ocean waters; swimming at the shore and in inland lakes; and hunting, birding, botanizing, photographing, picnicking, and sightseeing throughout. It is this sense of the use and enjoyment of all of the landscape which is undoubtedly the most significant factor governing future planning, particularly recreational planning, for the Pinelands. Because so large an area remains intact in a relatively undeveloped state, the recreational resources and opportunities are abundant. But because so many recreational activities are inherently dependent upon the maintenance of a large contiguous area of open space and the existing natural environmental quality, overdevelopment of the pinelands must be regarded as an omnipresent threat to its recreational vitality. Thus, the plan embodied in this study attempts to respond to predicted short term growth pressure while striving for the maintenance of an environmental quality conducive to the greatest enjoyment and development of the area's recreational resource potential.

This study incorporates the use of a classical model for decision-making. As such, it has addressed the need for a source of basic information - data; has conducted an evaluation of the importance and relevance of that data to particular planning tenets - analysis; and, culminated in a synthesis of relevant criteria and drawn conclusions - plan preparation. This process is discussed below relative to six basic components -- Background research and conduct of a Data Inventory, preparation of a User Uses Profile, examination of the framework for the Provision of Recreational Opportunities, the Identification of Relevant Issues, Recreational Resource and Environmental Analysis, and Plan Recommendations.

## SUMMARY REPORT

## BACKGROUND DATA INVENTORY

---

The recreational landscape of the Pinelands is composed of three principal components, which are responsible for the overall quality and quantity of the area's recreational resources and its unique and fragile character. They are the vegetative communities, or predominant land cover; the surface water quality and quantity; and the bay and shore ecosystems. These three landscape constituents, which now serve to identify and define the recreational value of the Pinelands, have always acted as a prime determinant of man's interrelationship with the Pinelands.

The vegetative and hydrological communities of the Pineland have long provided key natural resource bases for settlement and industrial vitality since the latter half of the 17th Century. Logging provided lumber and firewood for growing urban areas like New York and Philadelphia. New Jersey's position as the leading producer of iron in the country was totally dependent upon the wood resources of the state; and the abundance of wood resources enabled this industry to flourish in the Pinelands between the late 17th Century and mid-19th Century. The ultimate decline of the iron industry in the Pinelands was not only due to the discovery of coal and richer iron deposits in Pennsylvania and the development of the railroad, but to the exhaustion of the area's wood supply.

Other industries endemic to the Pinelands included glass, paper and cedar mining. Cedar was cut for ship building, which flourished along its navigable rivers. Indeed, the shipping industry took advantage of the strategic location of the Pinelands, with access to the ocean, to import and export industrial products to and from other locations along the eastern seaboard. However, shipping and shipbuilding and the industrial use of the area's natural resource base, in general, declined dramatically after 1860. At the end of the 19th and beginning of the 20th Centuries, commercial cranberry and blueberry farming flourished. As a result of this past industrial activity in the Pinelands, the area is rich in cultural heritage; and, it may be argued, that the wealth of historic archaeological and architectural resources provide a fourth principal component to the recreational landscape of the Pinelands.

Despite the value of this cultural resource base, however, it is still the natural constituents of the recreational landscape which serve to identify its most unique, yet fragile, character. The value of the recreational experience afforded by the Pinelands landscape may be shown to be totally intertwined with these environmental systems. Indeed, the most unique aspect of the vegetative communities of the Pinelands are embodied in their expansiveness and the extent of their undisturbed range. It is this fact which has contributed to the popularity of upland game (primarily deer) hunting and great interest in the sport, attested to by the presence of almost two hundred sportsmen's clubs in the area. Moreover, the vegetative communities of the bay and shore ecosystem, coastal marsh and wetlands, are conducive to the participation in waterfowl hunting activity and provide for excellent birdwatching opportunities, given testimony and enhanced by the presence of the Barnegat and Brigantine National Wildlife Refuges. The New Jersey Division of Fish, Game and Wildlife administers approximately 85,00 acres of wildlife management lands in the Pinelands to enhance the recreational use of the area for not only hunting and birdwatching, but also photography, sightseeing, driving for pleasure, fishing, shellfishing, and botanizing.

The vegetative communities, however, are also extremely fragile in nature and can be shown to limit participation in particular recreational activities in selected

areas of the Pinelands. The presence of numerous rare endangered and threatened plant communities within the overall vegetative community, and their inherent environmental sensitivity, preclude recreational use which would result in the alteration or disruption of their unique ecosystems. Similarly, the forest fire hazard potential of much of the Pinelands vegetation precludes indiscriminate recreational use.

The surface water conditions of the Pinelands are highly conducive to participation in water-based recreational activities. Surface water quality is excellent with much of the surface water regarded as potable. In fact, numerous 'pristine' aquatic communities have been identified. Thus, the Pinelands surface waters are, almost without exception, suitable for secondary contact recreation - boating, fishing and other limited-contact activities. The popularity of canoeing is testimony to this condition. Aside from water quality issues, participation in canoeing is augmented by the fact that surface water flow volumes are generally suited to such activity year-round, even during periods of drought and relatively low flow in September and October. Moreover, the overall aesthetic quality of the visual landscape in proximity to surface waters enhances participation in secondary contact activities. This is confirmed by the number of surface waters which have been designated as Potential National Wild and Scenic Rivers, State and National Wild and Scenic River Study Candidates and/or National Recreational River Study candidates.

The highly acidic nature of the freshwaters of the Pinelands do not, however, provide a suitable habitat for many sport fish species. Some sport fish are present in selected areas, but, on the whole, freshwater fishing may best be described as 'limited.' The close interrelationship between the groundwater and surface water of the Pinelands is conducive to potential pollution problems, as a result of the rapid percolation rates associated with many Pinelands soils. Excessively rapid percolation does not allow for the proper assimilation and degradation of sewage effluent before it reaches the groundwater. Future development in the Pinelands must seek to avoid such problems and protect the recreational value of its surface waters.

Primary-contact activities such as wading, swimming, diving, surfing, and waterskiing, are not that highly developed in the Pinelands, particularly as they might relate to freshwater resources. Freshwater facilities are relatively limited in number and provide principally for such activities as swimming and wading. Waterskiing does take place on Lake Lenape, near Mays Landing, which is, by far, the largest freshwater lake in the Pinelands used for recreation. Saltwater facilities, which are associated with the bay and shore ecosystems are more conducive to primary-contact recreation activity. Waterskiing and diving are popular on the bay and the lower reaches of the Mullica and Great Egg Harbor Rivers. Wading, swimming, and surfing are confined, generally, to shore locations within the Pinelands, particularly at Island Beach State Park, which must be regarded as one of the highest quality environments for such activity along the entire east coast, providing approximately nine (9) miles of shoreline in a relatively pristine natural state.

The bay is composed of mixed land use. However, an overall high level of quality is attained due to the presence of large undisturbed tracts of coastal marshland, two national wildlife refuges and several wildlife management areas. Its high quality is at least unique along the New Jersey coast and is generally most suited to secondary-contact activities such as saltwater boating, fishing, shellfishing and crabbing, birdwatching, botanizing and hunting. Bay ecosystems are extremely sensitive to increased water pollution and their continued use for recreational

purposes is dependent upon the maintenance and enhancement of existing water quality conditions. However, their location in proximity to urban and suburbanizing areas mark their potential vulnerability to environmental degradation, which could threaten the function they perform as nesting, spawning, breeding, and migratory stopover areas for wildlife. This would affect such activities as hunting, sport fishing, shellfishing, crabbing, and birdwatching.

The high visual landscape quality of the Pinelands, in general, is conducive to the provision of attractive locations within which recreational activity would seek to take place. At a minimum, participation in recreational activity is enhanced by a high visual landscape quality context. This is true for almost all recreational activity and has a direct bearing upon such activities as: photography, sight-seeing, and driving for pleasure. Visual landscape quality indirectly, yet strongly, affects activities such as: canoeing, hiking and nature study. To a lesser extent it also affects hunting, horsebackriding, camping, and picnicking.

The nature, quantity, and location of the individual recreational resources/facilities which presently exist in the Pinelands, within the context of the recreational landscape described above, have been inventoried as part of this study. This information was extracted from numerous books, reports, papers, brochures, maps and pamphlets which were purchased in public bookstores, or acquired from various state, county, municipal, and/or private agencies, organizations or individuals. It was mapped originally on 7 1/2 minute U.S.G.S. quadrangle maps and then transferred to base maps at a scale of 1:125,000 for ease in conducting an inventory and for subsequent analysis and plan synthesis. These resources/facilities have been classified according to nine principal topics as follows:

- Scenic Recreational Resources/Facilities
- Public and Quasi-Public Lands
- Historic Resources
- ORV/Enduro Trails
- Bicycling/Hiking/Horsebackriding
- Water-based Recreational Resources/Facilities
- Camping Facilities
- Extensive Natural Recreation Areas
- Miscellaneous Recreational Resources/Facilities

This inventory, enumerating the individual resources/facilities within each topical category, and quantities of each, by county, and as a total for the Pinelands, is presented in Appendix A as Tables A.1 through A.9.

## USER/USES PROFILE

A profile of the Users and Uses associated with recreational land use in the Pinelands was developed by conducting a thorough examination of the individual recreational activities that occur within the Pinelands. This effort was undertaken to identify who Pinelands recreational users are, how and when recreational activity occurs, and the extent of recreational use of the Pinelands. A profile of users/uses, Table B.1 in Appendix B, was prepared. It addresses the following twenty-six (26) Pinelands' recreational activities for which detailed participation information was available and serves to describe the socioeconomic characteristics of people who participate in those recreational activities typical of the Pinelands. Although trapping is also pursued in the Pinelands for its recreational value, insufficient information existed to include it within the profile. Nonetheless, the South Jersey Association of Furtakers reports over 2000 members and an estimated 114,000 pelts are taken annually in the Pinelands. (N.J. Div. of Fish, Game, Wildlife)

Bicycling	Harvesting/Picking
Birdwatching	Hiking, nature walk
Boating, freshwater, motor	Hiking, trail
Boating, saltwater, motor	Historic site visiting
Boating, sail	Horsebackriding
Camping, tent, access by car	Hunting, upland, small game
Camping, trailer camper	Picnicking with family
Canoeing	Picnicking with large group
Driving for pleasure	Sunbathing
Fishing, freshwater, boat	Swimming, freshwater/public pool
Fishing, freshwater, shore	Swimming, saltwater
Fishing, saltwater, boat	Trail biking
Fishing, saltwater, shore	Wading

These activities were then examined to determine when and how their use occurred within the Pinelands, their seasonality and peak use and the extent of participation by out-of-state residents. In an effort to understand the extent of participation in this Pinelands-related recreation, estimates of recreation demand were developed for each activity and for Pinelands recreation, as a whole. A discussion of the profile and recreation demand is presented, in summary form, below, and in detail, in Appendix B.

### Characteristics of Recreational Use

#### Activity Popularity

The profile of recreational users was adapted from a 1975 survey of New Jersey residents conducted for the 1977 New Jersey State Comprehensive Outdoor Recreation Plan (SCORP). It revealed that among twenty-six (26) activities, which may be characterized as 'Pinelands activities,' included in the survey, bicycling, driving for pleasure and swimming were the most popular. Approximately 50 percent of all the survey respondents indicated participation in each of these activities. Relative to activities more closely associated with recreation in the Pinelands, 5 percent indicated participation in canoeing, 9 percent in trail hiking and 5 percent in trailer/camper camping. Among other important Pinelands activities, approximately 4 percent of the respondents indicated they go hunting and 20 percent saltwater boat fishing. Sail boating and trail biking were among the least popular activities according to the New Jersey respondents.

#### Socioeconomic Profile

In summary, of the residents users who indicated participation in Pinelands recreational activities, approximately 90 percent were white, 74 percent lived in single family homes and 29 percent had annual family incomes greater than \$20,000 (1975). Most of the respondents were married (82 percent) and had a high school, or higher, level of education (83 percent).

#### Out-of-state Participation

Participation estimates for 1980 developed, as part of this study, indicate that out-of-state participation in recreational activity in the Pinelands is close to 14 percent; and data from the SCORP reported that an average of 60 percent of the out-of-state recreation participation in New Jersey traveled from adjacent counties in New York and Pennsylvania. Canoeing and saltwater swimming received the greatest share of out-of-state participants, approximately 50 percent. In addition, although the New Jersey resident survey indicated that approximately one-third (1/3)

of the participants in trailer camping were from out-of-state, the 1976 Campground Study conducted by the Cape May County Planning Board found over one-half (1/2) of the users were from out-of-state. Other activities with high rates of non-resident participation include sailboating, tent (car access) and trailer camping, and both freshwater and saltwater fishing. Activities less likely to involve out-of-staters include bicycling, driving for pleasure, historic site visitation, hunting and trail biking.

### Seasonal and Peak Use

Although recreational activity is generally reduced during the winter months, outdoor recreation in the Pinelands is a year-round phenomenon. Campgrounds at all State Parks and a few private facilities remain open all year, and even the canoeing rivers maintain adequate flows and remain ice-free throughout most of the year. An analysis of the peak use data reported in the SCORP revealed that bicycling and trail biking participation did not concentrate on a particular day or weekend. Trail hiking, nature walks, camping, horsebackriding and historic site visitation are among activities that exhibited a moderate amount of peak day or weekend use, while swimming was found to be the most concentrated. Hunting, which takes place during a controlled season, would be an extreme example of a seasonal and or/peak use activity. Overall, the New Jersey survey found that 90 percent of the respondents participated in their favorite activities during the weekend and 60 percent during the weekdays.

The National Recreation Survey (1972) found that participation in most activities typically takes place over two to three hours; although hunting, sailing and trail biking events were found to take place over slightly more than four hours. Moreover, trail hiking and canoeing, particularly in conjunction with camping, would most likely take place over much longer periods of time. With regard to long-term recreational activity, the Cape May County Campground Study found that the average camper planned to stay from 28 to 33 days at the campground.

### Demand for Recreation in the Pinelands

The primary source for estimating recreational demand in the Pinelands was the 1976 New Jersey Outdoor Recreation Demand Study. In that report, the demand for 56 recreational activities is estimated for 1976 and projected in five (5) year increments to the year 2000. Demand is expressed as the number of activity occasions (one participant per day) expected to occur in a given year and is reported for each county. To prepare demand estimates for the Pinelands, the appropriate county estimates (Table B.16 in Appendix B) were adjusted to reflect the demand associated with the population of the Pinelands portion of each county (Table B.15 in Appendix B), inter-county travel within the State to recreate, and out-of-state participation. Table B.16 in Appendix B, reports the present demand estimates for the twenty-six (26) 'Pinelands activities.' Overall, it is estimated that approximately 46,800,000 activity occasions will occur in the Pinelands in 1980.

Bicycling represents approximately 25 percent of these occasions. (However, this study is disposed to define bicycling as 'bicycle touring,' not children playing in the neighborhood as was probably reflected in the survey.) Camping by trailer or camper, represents 12 percent of the estimated activity occasions. In fact, if the tent camping (car access) estimates are included, camping would represent almost 16 percent of the total demand. Driving for pleasure, at approximately 11 percent, is the third most significant activity. Hunting, saltwater fishing by boat and freshwater swimming share in being ranked fourth among all Pinelands acti-



vities, each representing approximately 6 percent of the total estimated activity occasions. (The saltwater fishing activity estimates are probably high, but an adequate resource supply measure of these activities was not available to reliably adjust the estimates.) Saltwater swimming, which is by far the most significant activity for Southern New Jersey as a whole, represents only 4 percent of the total recreational demand in the Pinelands. Activities representing 2-3 percent of the total demand are hiking (both trail and nature walks), birdwatching and sailboating. Activities exhibiting relatively low levels of demand (less than 1/2 percent of the total activity occasions) include freshwater motor boating, freshwater boat fishing, picnicking with a large group and trail biking.

## THE PROVISION OF RECREATIONAL OPPORTUNITIES IN THE PINELANDS

Recreational opportunities in the Pinelands result from a variety of conditions; in particular the cultural and natural resources which create the unique Pinelands environment. In addition to these resources there are facilities provided by private, public and quasi-public organizations and agencies that expand both the opportunities and capacity of the Pinelands for recreational activity. This analysis, as documented further in Appendix C, is intended to estimate the revenues generated by recreational activity in the Pinelands and to document the active provision of recreational opportunities by the private, public and quasi-public sectors of the Pinelands economy.

### Expenditures

Total expenditure estimates attributable to recreational activity were derived using a two-step process. First, the expenditure patterns of recreational participants were examined to prepare average expenditure estimates of the Pinelands recreation participant. Second, the activity occasion estimates developed in Appendix B were refined to more accurately reflect the number of recreation trips in the Pinelands. The average expenditure estimates were extracted from a two volume study on summer tourism and travel activity prepared by the Eagleton Institute of Politics at Rutgers University for the New Jersey Department of Labor and Industry (March 1980), and the Cape May County Campground Study (1976). One Pinelands activity, camping at developed campgrounds, is distinct from the others in that it always involves an overnite stay. Therefore, separate estimates were prepared for the overnite camper/recreator and the daytime recreator. An expenditure of nine (9) dollars per person per day was estimated for campers and fifteen (15) dollars per person per day for daytime recreators.

In order to estimate total recreation trips, primary recreation activities were identified. Primary activities are thought to occur exclusive of participation in other forms of recreation; that is, it was assumed a trail hiker would not participate in sailboating during the same day. Primary Pinelands recreation activities include:

Birdwatching	Fishing, saltwater, boat
Boating, freshwater, motor	Fishing, saltwater, shore
Boating, saltwater, motor	Hiking, trail
Boating, sail	Historic site visiting
Camping, tent, car access	Horsebackriding
Camping, trailer camper	Hunting
Canoeing	Picnicking, with family
Fishing, freshwater, boat	Picnicking, with large group
Fishing, freshwater, shore	Swimming, saltwater

This resulted in an annual estimate for daytime recreation in the Pinelands of 15.42 million; and, 7.28 million for camping. Each occasion represents one person per day, regardless of the number of activities in which a person may participate. Multiplying these by the appropriate expenditure estimates yields total annual estimates of \$231.3 million for day use and \$65.9 million for overnite camping use, or a total 1980 Pinelands estimate of \$296.7 million. A perception of the magnitude of this figure may be obtained by realizing that attendance and income data for 1979 in State Parks, Forests, recreation areas and historic sites reveal that total income for these facilities in the Pinelands was nearly \$900,000. Receipts at Island Beach State Park accounted for more than one-half of these revenues, approximately \$500,000. In addition, some State income derived from recreation in the Pinelands which has not been estimated in this report includes license fees for boat registration, hunting, fishing and shellfishing. Thus, the overall economic value of direct expenditures for recreation in the Pinelands may be estimated at approximately \$300 million.

### Recreation Providers

The public sector provides recreational opportunities in the Pinelands primarily through State and local parks, forest and wildlife management areas. State-owned parks, forests, recreation areas, historic sites and fish and wildlife management areas total over 240,000 acres. Within the State Forests there are 540 campsites for tents and camper trailers (no hook-ups), 26 cabins and lean-tos, and more primitive facilities for up to 1200 tent campers. The State also provides 109 boat slips at the Forked River State Marina. Fees at the marina range from \$400 to \$695 per season (April through October). Campground fees are \$5 per site per night at all locations.

Federally-owned recreational land within the Pinelands includes the Brigantine and Barnegat national Wildlife Refuges (27,800 acres). There are developed birdwatching facilities and a short nature tour at Brigantine. No fee is charged at either refuge. County parks encompass approximately 3070 acres at three locations; and there are 32 municipal parks.

The major private sector recreational facilities in the Pinelands are campgrounds, with 71 operations providing over 12,800 campsites. They typically provide many sites for camper trailers with hook-ups for water, sewer and electricity, along with a limited number of tent campsites. Rates average from \$6 to \$9 per night, \$12 to \$14 with hook-ups. Canoe rentals are provided by 17 private canoe liveries with an inventory of more than 1200 canoes. Rentals are typically \$10 per day, with an additional \$5 transportation fee. Other private sector recreational providers include the Atlantic City Race Track, the Atco Dragway, an amusement park, marinas, golf courses and a nudist camp.

Non-profit private and quasi-public organizations also provide recreational opportunities or services. The Batona Hiking Club maintains the 39-mile trail of the same name. It crosses both private and public land. The Whitesbog Environmental Studies Center maintain 63 acres for hiking and nature walks and there are two private wildlife management refuges that provide nearly 200 acres. The Boy Scouts and Girl Scouts, church organizations and the YMCA offer camping programs at thirteen locations. Private clubs include the East Coast Enduro Association, which maintains over 650 miles of enduro trails throughout the Pinelands; canoeing clubs; and over 200 sportmen's clubs.

## IDENTIFICATION OF RELEVANT ISSUES

A major component of this study was concerned with the identification of the major issues, problems and/or conflicts associated with the present recreational use of the Pinelands. It was accomplished primarily through the implementation of a Public Participation Program which sought to involve anyone concerned with recreation activity in the Pinelands, including Pinelands residents, proprietors of recreational businesses, administrators of State recreational facilities, the average recreator, and particularly well-informed individuals with a knowledge of the use of Pinelands' recreational resources. This interaction with the public was conducted through two organized formats. The first involved the conduct of two workshops: at Atlantic County Community College on Tuesday, July 24th, and at the Whitesbog Environmental Studies Center on Thursday, July 26th. A list of attendees to the workshops, who totalled 67, and a copy of the questionnaire format and results, which provided a structure for them are presented as Figures D.1 and D.2, respectively, in Appendix D. The second format involved the conduct of interviews with 59 informed individuals with particular knowledge of issues pertinent to participation in particular recreation activities. A list of these interviewees is presented as Figure D.3 in Appendix D.

In general, the pertinent issues identified may be categorized according to eight topical headings including:

- resident vs. non-resident
- quality vs. volume of recreational experience
- public vs. private recreational roles
- public enjoyment vs. resource protection
- control vs. traditional freedom
- recreational land use vs. other major land use
- recreational land use vs. recreational land use
- enforcement vs. non-enforcement of existing rules, regulations and laws

More specifically the major issues, problems and conflicts identified through the public participation program include the following:

- designation of ORV use areas
- competition between State and private campgrounds
- overcrowding of canoe runs
- litter
- trespass
- vandalism
- inadequate policing of recreation areas, particularly on State lands
- illegal hunting and trapping
- encroachment of development on recreational facilities, particularly hiking trails and campgrounds
- debris in streams and rivers which block passage and preclude canoeing use
- barrier-free accessibility to recreational facilities
- habitat destruction and disruption
- fire hazards due to illegal fires
- potential use of tax lien lands for recreation
- inadequate parking and poorly maintained roads
- keeping existing roads open and opening new ones

- irresponsible use of 4-wheel drive vehicles and motorcycles
- water quality
- tardiness in marking boating channels
- wildlife management and habitat improvement
- congestion at river access points

A detailed discussion of these issues, which are directly related to participation in certain recreational activities is presented in Appendix E. However, some of the issues identified above are not necessarily inherent to participation in recreational activity, or the use of particular recreational facilities, and may be regarded as more general issues, problems and/or conflicts. Moreover, their resolution, it may be argued, is the most significant step which may be taken to improve and enhance the Pinelands recreational experience. These problems generally involve the commission of illegal acts or the violation of existing rules and regulations. Trespass, littering, and vandalism are three acts which have been complained about by many of the people interviewed. In all fairness, however, the issue of trespass is somewhat more understandable, although not more tolerable, than the other two, due to the problems associated with the identification of public versus private lands. Such problems are generally most acute for private lands which are surrounded by, or immediately adjacent to, public land. This problem should be reduced over time as those private lands totally surrounded by State land are brought into public ownership. All of these acts, however, and others, such as alcoholic beverage consumption (and related, disorderly conduct) at State facilities, and the use of fires when not permitted, could be reduced through increased police enforcement and surveillance activity by parks and forest rangers. However, the shortage of personnel for such purposes is a problem in itself.

Enforcement of all rules and regulations is an extremely difficult task complicated by personnel shortages and the extensive nature of the Pinelands. Enforcement, however, is not always the most practicable or effective way of dealing with recognized problems. Quite often, user adherence to regulations may be more effectively addressed through education and awareness programs aimed at being informative and increasing the user sensitivity to the Pinelands resources and the purpose and rationale for the regulations which are directed to protecting not only the resources but to providing a high quality user experience.

Increased demand for participation in recreational activities in the Pinelands in the future will require the provision of more facilities or will otherwise serve to aggravate many of the problems and conflicts which already exist, at least in the short run. Long-term effects may, in fact, result in decreased demand for 'backwoods' activities as a result of degradation of the remote recreational experience the Pinelands can offer, thus reducing public enjoyment of this unique recreational environment. This is particularly true for activities which are presently subject to the problem of overcrowding. A discussion of the primary and secondary impacts which may be associated with growing recreation demand are discussed in detail in Appendix F.

#### RECREATIONAL RESOURCES ENVIRONMENTAL ANALYSIS

Having identified the quantity, quality and location of existing Pinelands recreational resources and having analyzed the recreational users and providers and the major issues associated with recreation activity, a recreational resource and en-

Environmental analysis was conducted to coordinate the physical aspects of plan preparation. The three principal components of this analysis are: the identification of unused potential for recreation in the Pinelands, an analysis of physical attractiveness for recreational land use, and an analysis of environmental compatibility.

Unused potential for recreation activity has been discussed as part of a discussion of the need for additional recreational facilities in Appendix D. Indeed it may be argued that potential exists even beyond those examples provided. However, it is not necessarily desirable, nor is it considered the function of this study to advocate the development of the Pinelands to the limit of its maximum recreation potential. Three activities, however, are deserving of particular attention. They are swimming, picnicking and individual and small group participation in 'backwoods' (wilderness-like) activities such as backpacking and overnite camping under conditions of relative remoteness.

Perhaps the greatest example of unused potential for the recreational use of the Pinelands is the lack of facilities which take maximum advantage of the identify of the Pinelands as a quasi-wilderness. The most basic step which can be taken to make use of this potential is the prohibition of activities and facilities which may detract from it, particularly in areas where the potential is highest; and provisions need to be made to control the population of users and intensity of use of existing facilities in areas where this potential is thought to exist.

The popularity of the activities and relative paucity of facilities for swimming and picnicking in the Pinelands are testimony to the need for such facilities. The minimal site requirements for picnic areas and the number of existing lakes, ponds, impoundments, streams, rivers and even areas of shallow watertable suitable for the creation of swimming facilities are testimony to unused potential.

In order to identify those areas where certain recreational facilities are likely to want to locate, to take advantage of unused potential and to provide input to planning for their inclusion in zones of compatible recreational land use intensity, an analysis was undertaken to address Attractiveness for Recreational Land Use. Attractiveness for recreation is intended to identify areas particularly conducive to participation in certain activities, according to a high enjoyment level, or capable of providing necessary facility support functions. Two components of this analysis were employed. The first was concerned with information which had been mapped, as part of the study, and addressed the following topical areas of concern:

- Septic Tank Suitability
- Visual Landscape Quality
- Wildlife Habitat Suitability
- Areas of Cultural Interest
- Areas of Particular Natural Environmental Interest
- Areas of Educational Interest
- Desirable Land Use Facilities

Two of these criteria, Visual Landscape Quality and Areas of Particular Natural Environmental Interest, involved the conduct, according to a map format, of two preanalyses. Visual Landscape Quality addressed areas which are characterized by strongly positive (most liked) and strongly negative (most disliked) rural landscape elements. The criteria used to identify these two polar components of Visual Landscape Quality are presented on Figure G.1 in Appendix G. The identifi-

cation of areas of particular natural environmental interest involved an evaluation of unique ecological resources. In particular the following categories of information were mapped:

- sites supporting rare, endangered or threatened plants
- sites supporting rare, endangered or threatened animals
- unique or exceptional ecosystems; representative vegetation types; and, oldest, largest or exceptional individuals
- sensitive watersheds (pristine aquatic communities which are headwaters)
- scientific research areas
- breeding areas, overwintering concentrations, and migratory stopover areas

Figure G.2, in Appendix G, identifies the interplay of the seven (7) attractiveness criteria listed above with proposed recreational land use and the mapped information pertinent to the geographic identification of areas of relative attractiveness. In addition to these mapped criteria, some equally important attractiveness criteria, which were not mapped, are recognized and were given due consideration during the process of plan synthesis. They include:

- Proximity to Roads
- Accessibility to Public Services and Utilities
- Land Values and Costs
- New Jersey Pinelands Draft Comprehensive Management Plan

The latter was most important and was used to identify the potential future character of the Pinelands.

A similar analysis was undertaken to determine the Environmental Compatibility of proposed recreational land uses with environmentally sensitive areas of the Pinelands. It addressed the following topical areas of concern:

- Fire Hazard
- Loss of Natural Resource Base
- Incompatibility with Existing Land Use
- Degradation of Visual Landscape Quality
- Potential for Groundwater Contamination
- Threat to Existing Cultural Resources
- Incompatibility with Existing Vegetative Ecology
- Threat to Existing Natural Resources of Particular Merit
- Potential Alteration of Groundwater Table or Land Surface Conditions
- Potential for Surface Water Pollution
- Habitat Disruption/Impact on Wildlife
- Health/Safety Hazard

This analysis is presented graphically in Figure G.3, in Appendix G. Environmental Compatibility also incorporates the New Jersey Pinelands Draft Comprehensive Management Plan, particularly as it relates to the recreational experience objectives of a future plan and their compatibility with parameters governing future growth.

These two analyses, Recreation Attractiveness and Environmental Compatibility, were used directly in the development of the Recreational Land Use Intensity Plan, which is described in the following section.

## PLAN RECOMMENDATIONS

---

The Plan Recommendations for the Recreational Component of the Pinelands Comprehensive Management Plan have been prepared in response to the analysis of user and uses profiles, identification of issues and environmental and recreational resource analyses presented in the preceding sections. They are presented according to both a graphic and narrative format. A map, or plan, has been prepared in order to spatially define the proposed limits of varying intensities of future recreational use of the Pinelands. The narrative sets forth various performance recommendations relative to the design, implementation and management of existing and future recreational facilities in accordance with the intensities of recreational use proposed for the different geographical locations within the Pinelands. These two categories of recommendations -- The Plan and Performance Recommendations -- are discussed in greater detail below and in Appendix H.

### The Plan

A map depicting the geographical distribution of seven proposed zones of varying recreational land use intensity, Figure 2, serves as the framework for the distribution of recreation land use within the Pinelands and the application of the performance recommendations. The seven categories represented are: Very low, Low, Moderate, High, Recreational Node, Bay, and Federal Lands.

Figure 3, the Recreation Land Use Suitability Matrix, depicts the proposed distribution of individual recreation activities within each of the zones. The exclusion of a particular activity is reflective of either its prohibition due to reasons of environmental compatibility with the natural resources, compatibility with the recreational experience objectives, or an overall lack of attractiveness for the activity within a particular zone. The following zone descriptions serve to identify the context within which these criteria exist and interact.

Very Low - The Very Low Intensity Zone is intended to define the area within the Pinelands within which the recreational experiences to be provided are most conducive to the appreciation of its natural amenities and 'quasi-wilderness' character. Activities, which are likely to result in significant environmental impact(s) are to be prohibited; whereas, activities conducive to a relatively passive appreciation of the natural environment are to be promoted. The area is generally characterized by very high visual landscape quality, the presence of numerous unique and exceptional ecosystems, characteristic Pinelands vegetative communities, wildlife habitats and locations for rare, endangered or threatened plants and animals, and a minimum of paved roads and structures. Existing recreational resources include, most notably, numerous hiking trails including more than eighty percent of the Batona Trail, a number of primitive campsites (including the only two within the Pinelands not accessible by car), and stretches of canoeing rivers with potential for designation as both Federal and State Wild and Scenic Rivers.

Low - This zone is characterized by a landscape similar in nature to that found in the Very Low Intensity Zone. It is characterized by very high visual landscape quality, the presence of numerous unique and exceptional ecosystems, wildlife habitats, and locations for rare, endangered and threatened flora and fauna, and characteristic Pinelands vegetative communities, which are not suited to recreational uses, which may result in significant environmental impact(s). However, the presence of either existing recreation land uses, or other forms of development such as paved roads and settlements are likely to preclude the use of this area for the attainment of an identical recreational experience. As a result, it is proposed to

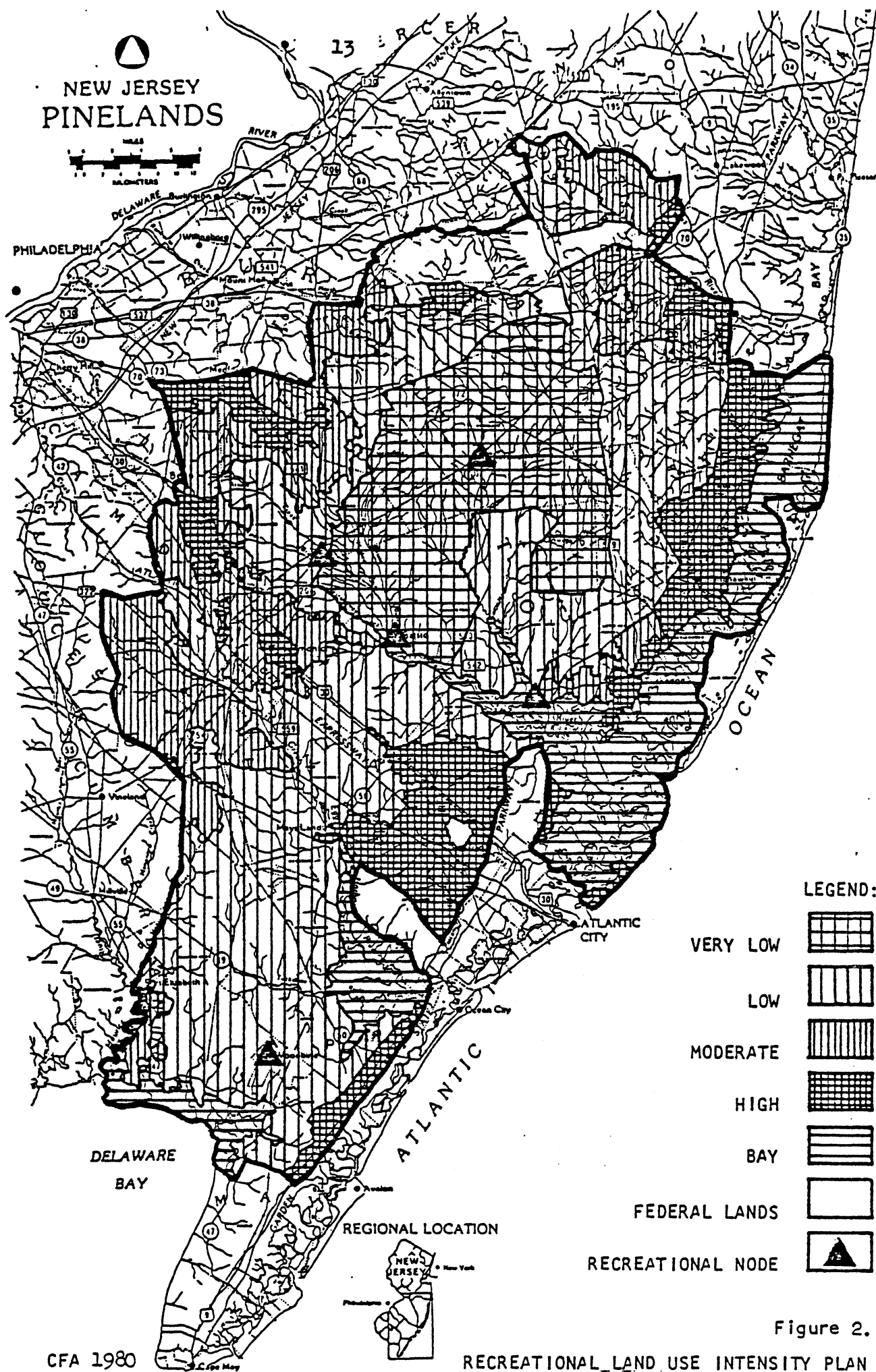


Figure 2.



**Recreation Land Use:**

Picnicking  
 Photography  
 Campground - low intensity  
 Driving for Pleasure  
 Sightseeing  
 ORV (use area)  
 Hiking Trail  
 Horse Trail  
 Bicycle Route  
 Power Boating (>10 hp.)  
 Power Boating (<10 hp.)  
 Boat Launch, ramp  
 Boat Launch, car-top  
 Canoe Livery  
 Canoeing river - high intensity  
 Canoeing river - low intensity  
 Boating/canoeing (lake) - high intensity  
 Boating/canoeing (lake) - low intensity  
 Fishing river  
 Fishing lake  
 Fishing, saltwater  
 Marina  
 Shellfishing crabbing  
 Swimming - high intensity  
 Swimming - low intensity  
 Campsite - primitive (individual)  
 Campsite - primitive (group)  
 Campground - high intensity  
 Birdwatching  
 Botanizing  
 Cross-country skiing  
 Motorcycling (ORV) (Enduro)  
 Hunting  
 Trapping

### Figure 3 - Recreation Land Use Suitability Matrix

provide for a minimal impact nature-oriented recreational experience which takes advantage of its proximity and similarity, to the Very Low Intensity Zone, in the Northern Pinelands, and the generally high landscape quality in the Southern Pinelands without allowing for excessive development. The area presently is traversed by enduro (motorcycle) trails, dotted with commercial campgrounds and other miscellaneous private commercial recreational facilities. Other existing recreational resources include many miles of rivers with potential for designation as Federal and State Wild, Scenic and Recreational Rivers, numerous State Wildlife Management Areas, Historic sites and settlements, hiking trails, and sand roads open to the public, numerous hunt clubs and acres of hunting lands.

Moderate - Areas proposed for moderate intensity recreational land use are generally located on agricultural land, or in areas designated as 'Agricultural Production' or 'Rural Growth' districts as part of the Draft Comprehensive Management Plan. Due to their less than characteristic Pinelands landscape, they are suited to relatively high intensity recreational use. However, although suited to a number of recreational land uses, it will be some time before the regional growth dynamics of these areas and the areas surrounding them take form so as to determine their ultimate recreational character. Long-range suburban rural development will likely result in a more urban/suburban recreational orientation. In the interim, it is not likely that much new recreation development will take place beyond the accommodation of existing activity. Most significantly, it is hoped that this zone will remain primarily agrarian, providing for the enhancement of regional recreational activities like hunting and those dependent upon a high visual landscape quality and the opportunity for long distance views, such as sightseeing, photography, or driving for pleasure.

High - The High Intensity Zones are generally confined to areas of existing development, or areas designated as 'Regional Growth' districts in the Draft Comprehensive Management Plan. As such, they are suitable for almost every recreational activity under consideration. Only saltwater fishing, shellfishing, and primitive camping are not proposed for these zones; although, depending upon the rapidity with which these areas develop, many more activities may not be able to find attractive locations within them. In fact, depending upon the rate and amount of growth, this zone may become most suitable for very high intensity urban/suburban recreational facilities such as playfields, playgrounds, and primarily linear urban/suburban open space features, etc. Most significantly, it should be pointed out that this is one of two zones permitting high intensity camping, consistent with the fact that most existing high intensity campgrounds are also located therein. Equally significant is the fact that most of the High Intensity Zones are located on the periphery of the study area in proximity to existing services and facilities and amenities such as the seashore.

Recreational Nodes - Six Recreational Nodes have been identified in the Plan. They include Double Trouble, Chatsworth, New Gretna, Atsion, Batsto Pleasant Mills and Woodbine. They are surrounded almost exclusively by the Low and Very Low Intensity Zones. These locational criteria are most conducive to the principal function proposed for these zones. In effect, they are to serve as locations within which higher intensity recreation facilities should be located to serve recreational activities and users within the Low and Very Low Intensity Zones (within which such uses have not been found to be compatible). In addition, other commercial establishments may locate within such areas, providing for the sale of foodstuffs, equipment, fuel, first aid, etc; thus comprising, in conjunction with the recreational activities designated suitable on Figure 2 and the other land uses recommended as part of the Draft Comprehensive Management Plan, a sort of Recreational Village.

(The delineation of their exact areal configuration is delegated to the respective municipalities within which they are located, subject to review by the Pinelands Commission.)

Bay - The Bay Zone is comprised almost totally of areas of coastal marsh and water. As such, the activities most suitable for inclusion within them are generally those which are dependent upon the bay and shore ecosystem for their existence. The environmental sensitivity of this ecosystem is an equally significant consideration in determining recreation suitability. Existing recreational resources include Federal Wildlife Management Areas Refuges, State Wildlife Management areas, migration stopover, breeding and nesting areas for waterfowl, and shellfishing and saltwater fishing waters. Hunting, fishing, boating, birdwatching, botanizing, driving for pleasure, and sightseeing are proposed as the principal future recreational activities.

Federal Lands - Federal Lands have been identified specifically to avoid making any determinations of recreational land use intensity for them. Their existing use is specific, and effectively precludes any recreational activity not specifically provided for. It is assumed that this Plan will be updated at the time that the disposition of such lands might be changed. Lands included within this zone are the Fort Dix Military Reservation, McGuire Air Force Base, Lakehurst Naval Air Station and the National Aviation Facilities Experimental Center (NAFEC).

Some activities, it may be observed, are suitable for inclusion in all of the zones, either because of their overall environmental compatibility and minimal impact associated with their occurrence; or, the inability of the zone to address the detailed, and often small-scaled, site requirements for location (i.e. given the relative sizes of the zones it is impossible to say that some location cannot be found within them which is suited to the given activity). These activities include picnicking, photography, sightseeing, driving for pleasure, birdwatching, botanizing and hunting. It should be pointed out, however, that this ubiquitous suitability will likely be reduced over time as the Recreational Nodes and High and Moderate Zones undergo suburbanization, thus transforming their existing landscapes to some less suitable condition.

#### Performance Recommendations

The allocation of particular recreation activities to the different recreational land use intensity zones in the Plan is contingent upon their ability to conform to various performance requirements. Thus, the recreational activities need to be more specifically defined relative to their satisfaction of the recreational objectives for each zone through compliance with such requirements. In particular, site planning standards are needed for facilities such as marinas and ORV use areas and activities such as camping. Management techniques are needed for activities such as canoeing and camping. The following uses are discussed in Appendix H. relative to any pertinent planning criteria, management techniques and or potential economic incentives and cooperative arrangements which are applicable to their inclusion in the recreational land use intensity zones:

- |                                     |  |
|-------------------------------------|--|
| - campground - low intensity        | - boat launch - car-top                    |
| - campground - high intensity       | - boat launch - ramp                       |
| - campsite (primitive) - individual | - marina                                   |
| - campsite (primitive) - group      | - canoe livery                             |
| - ORV (use area)                    | - canoeing (river) - high intensity        |
| - ORV (motorcycling enduros)        | - canoeing (river) - low intensity         |
| - hiking trails                     | - boating canoeing (lake) - high intensity |

- horse trails
- bicycle routes
- power boating - 10 hp.
- power boating - 10 hp.
- boating canoeing (lake) - low intensity
- swimming - high intensity
- swimming - low intensity
- picnicking

However, the following activities may not be discussed appropriately relative to the performance recommendations due to their ubiquitous nature, relatively high environmental compatibility, lack of information concerning the activity which would support the imposition of any detailed performance requirements, a desire to allow the present management practices to continue, or indirect regulation through provisions set forth for the activities listed above:

- photography
- diving for pleasure
- fishing river
- fishing lake
- fishing saltwater
- sightseeing
- shellfishing crabbing
- birdwatching
- botanizing
- cross-country skiing
- hunting
- trapping

The enforcement of performance recommendations and implementation of the various management techniques and economic incentives and cooperative arrangements will insure meeting the recreational experience objectives for each recreational use zone and provide for the maintenance and enhancement of the existing environmental quality, vitally conducive to the enjoyment and popularity of recreational activity in the Pinelands. To this end, suggestions are also made in Appendix H, for alternative courses of action by the Pinelands Commission to begin implementation of the plan recommendations and performance regulations.

## **APPENDICES**

## APPENDIX A: DATA INVENTORY

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total
Hiking - Batona Trail (picturesque segment) <sup>1</sup>	-	-	-	-	-	3.0	-	3.0
Potential National Wild and Scenic Rivers <sup>1</sup>	8.0 <sup>3</sup>	-	18.5 <sup>3,4</sup>	10.5 <sup>5</sup>	55.5 <sup>5,6</sup>	75.0 <sup>4,6</sup>	10.5	126.5
Potential State Wild and Scenic Rivers <sup>1</sup>	-	-	-	-	4.0 <sup>7</sup>	9.0 <sup>7</sup>	10.0	19.0
State Wild and Scenic River Study Candidates <sup>1</sup>	8.0 <sup>8</sup>	19.5 <sup>9</sup>	16.5 <sup>8,10</sup>	14.0 <sup>11</sup>	73.0 <sup>9,11,12</sup>	63.5 <sup>10,12</sup>	21.0	163.5
Scenic Vista <sup>2</sup>	-	-	-	-	-	1	-	1
Sightseeing Route/ Automobile Tour (scenic, fall foliage, nature, historic) <sup>1</sup>	2.0	15.0	-	43.0	102.0	120.0	99.5	381.5
Lookout Fire Observation Tower <sup>2</sup>	-	-	1	-	5	4	1	11

A.1

#### NOTES:

<sup>1</sup> Unit of measurement is number of miles.

<sup>2</sup> Unit of measurement is number present.

<sup>3</sup> 8.0 miles common to Gloucester and Camden Counties.

<sup>4</sup> 10.0 miles common to Camden and Burlington Counties.

<sup>5</sup> 10.5 miles common to Cape May and Atlantic Counties.

<sup>6</sup> 23.0 miles common to Atlantic and Burlington Counties.

<sup>7</sup> 4.0 miles common to Atlantic and Burlington Counties.

<sup>8</sup> 8.0 miles common to Gloucester and Camden Counties.

<sup>9</sup> 5.0 miles common to Cumberland and Atlantic Counties.

<sup>10</sup> 4.0 miles common to Camden and Burlington Counties.

<sup>11</sup> 14.0 miles common to Cape May and Atlantic Counties.

<sup>12</sup> 21.0 miles common to Atlantic and Burlington Counties.

Table A.1. - Scenic Recreational Resources/Facilities

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total
Warren Grove Target Area (Leased Land)	-	-	-	-	-	-	-	
State Recreation Area Warren Grove <sup>1</sup>	-	-	-	-	-	192	426	618
Parks - State <sup>1</sup>								4710
Double Trouble	-	-	-	-	-	-	1677	1677
Island Beach	-	-	-	-	-	-	3002	3002
Barnegat Lighthouse	-	-	-	-	-	-	31	31
Parks - County <sup>1</sup>								3071
Robert J. Miller								
Air Park	-	-	-	-	-	-	850	850
New Brooklyn Park	-	-	552	-	-	-	-	552
Tuckerton	-	-	-	-	-	-	17	17
Estell Manor	-	-	-	-	1652	-	-	1652
Municipal Recreation/ Conservation Facility	2	3	8	2	7	1	9	32
State Forests <sup>1</sup>								150322.4
Lebanon	-	-	-	-	-	17686	9309.3	26995.3
Wharton	-	-	14263.4	-	11208.1	74166.7	-	99638.2
Penn	-	-	-	-	-	3366	-	3366
Bass River	-	-	-	-	-	7553.5	1546.5	9100
Belleplain	-	1522.6	-	9700.3	-	-	-	11222.9
Tax Exempt Lands								
Green Acres <sup>1</sup>								1935
Egg Harbor Township (Natural Area)	-	-	-	-	252	-	-	252
Hamilton Township	-	-	-	-	201	-	-	201
Evesham Township	-	-	-	-	-	3	-	3

A.2

Table A.2. - Land Ownership/Public and Quasi-Public Lands



	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total	
Tax Exempt Lands									
Green Acres <sup>1</sup> (cont'd.)									
Camp Kettle Run (Girl Scouts)	-	-	-	-	-	349	-	349	
Medford Leas	-	-	-	-	-	34	-	34	
Camp Inawendiwin (Girl Scouts)	-	-	-	-	-	470	-	470	
Lowland Forest (N.J. Audubon Society)	-	-	-	28	-	-	-	28	
Lowland Forest (N.J. Audubon Society)	-	-	-	164	-	-	-	164	
Wetlands	-	289	-	-	-	-	-	289	
Jackson Township (Natural Area)	-	-	-	-	-	-	20	20	
Keswick Grove	-	-	-	-	-	-	125	125	A.3
Wildlife Management Areas -									
State <sup>1</sup>									85308.2
Absecon	-	-	-	-	3548	-	-	3548	
Beaver Swamp	-	-	-	2700	-	-	-	2700	
Collier's Mills	-	-	-	-	-	-	12212	12212	
Dennis Creek	-	-	-	5109	-	-	-	5109	
Great Bay Boulevard	-	-	-	-	-	-	4141	4141	
Greenwood Forest	-	-	-	-	-	-	8958.9	8958.9	
Heislerville	-	3844	-	-	-	-	-	3844	
Manahawkin	-	-	-	-	-	-	965	965	
Manchester	-	-	-	-	-	-	2376	2376	
Pasadena	-	-	-	-	-	-	3119.9	3119.9	
Peaslee	-	11199	-	1386.5	1440	-	-	14025.5	
Port Republic	-	-	-	-	755	-	-	755	
Prospertown Lake	-	-	-	-	-	-	119.4	119.4	
Stafford Forge	-	-	-	-	-	-	2788	2788	
Swan Bay	-	-	-	-	-	1078	-	1078	
Lester G. MacNamara	-	-	-	3157.8	9279.9	-	-	12437.7	

Table A.2. - Land Ownership/Public and Quasi-Public Lands (cont'd.)

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pine Islands Total
Wildlife Management Areas - State <sup>1</sup> (cont'd.)								
Whiting	-	-	-	-	-	-	1190.8	1190.8
Winslow	2012.2	-	3927.8	-	-	-	-	5940
Wildlife Management Areas - Federal <sup>1</sup>								27837
Brigantine	-	-	-	-	19885	119	256	20260
Barnegat	-	-	-	-	-	-	7577	7577
State Marina <sup>1</sup>	-	-	-	-	-	-	13	13
State Natural Area - Non-designated <sup>1</sup>								97.7
Hammonton Natural Area	-	-	-	-	97.7 -	-	-	97.7
State Natural Areas - Designated <sup>1</sup>								3887
North Brigantine	-	-	-	-	678	-	-	678
Great Bay	-	-	-	-	-	-	395	395
Island Beach Research Area and Wildlife Sanctuary	-	-	-	-	-	-	1200	1200
Island Beach	-	-	-	-	-	-	700	700
Manahawkin	-	-	-	-	-	-	64	64
Batsto and Great Swamp	-	-	-	-	200	150	-	350
Oswego River	-	-	-	-	-	100	-	100
Oswego River (Martha's Bog)	-	-	-	-	-	200	-	200
Cedar Swamp	-	-	-	-	-	100	-	100
Absegami Trail	-	-	-	-	-	100	-	100

Table A.2. - Land Ownership/Public and Quasi-Public Lands (cont'd.)

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pine lands Total	
<b>Institutional Lands</b>									
Federal <sup>1</sup>								47950.3	
"NAFEC"	-	-	-	-	5055.3	-	-	5055.3	
Fort Dix	-	-	-	-	-	16022	15971	31993	
McGuire Air Force Base	-	-	-	-	-	3490	-	3490	
Lakehurst Naval Air Station	-	-	-	-	-	-	7412	7412	
<b>Institutional Lands</b>									
State <sup>1</sup>								6072	
Ancora Psychiatric Hospital	-	-	785	-	-	-	-	785	
New Lisbon State School	-	-	-	-	-	1854	-	1854	
Coyle Field <sup>3</sup>	-	-	-	-	-	635	-	635	
Leesburg State Prison	-	1094	-	-	-	-	-	1094	
Woodbine State School	-	-	-	206	-	-	-	206	
Stockton State College	-	-	-	-	1500	-	-	1500	
<b>Institutional Lands</b>									
County <sup>1</sup>								714.7	
Burlington County Community College	-	-	-	-	-	168.7	-	168.7	
Atlantic County Community College	-	-	-	-	546	-	-	546	

**NOTES:**

<sup>1</sup> Unit of measurement is acres.

<sup>2</sup> Unit of measurement is number present.

<sup>3</sup> Estimate

Table A.2. - Land Ownership/Public and Quasi-Public Lands (cont'd.)

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pine Islands Total
Historic Site (one structure or point of interest) -	-	10	10	9	39	22	26	126
Historic Site, National Register, State Register or HABS (one structure or point of interest) -	-	-	-	-	3	1	6	10
Historic Area (more than one structure, cluster of buildings) <sup>1</sup>	10	11	10	24	55	48	39	198
Proposed Historic District (more than one structure, cluster of buildings) <sup>1</sup> -	-	-	1	4	-	1	-	6
Historic Tour <sup>2</sup> -	-	14	-	42	66.5	88	83.5	294
Historic Railroad, Active Non-passenger <sup>2</sup> -	-	-	-	-	-	5	6	11
Historic Railroad, Active Passenger <sup>2</sup> -	-	-	14	19	45	-	-	78
Historic Railroad, Abandoned <sup>2</sup> -	-	-	7	-	10	12	25	54
Historic Road Trail <sup>2</sup> -	-	-	11	-	65	-	-	76
Historic District, National Register -	-	-	-	1	-	3	1	5
Historic Area, State Register -	-	-	1	-	1	4	2	8

NOTES:

<sup>1</sup> Unit of measurement is number present.

<sup>2</sup> Unit of measurement is number of miles.

Table A.3. - Historic Resources

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total
Enduro Trails <sup>1</sup>	-	169	-	7	-	239	236	651
ORV (Use Areas) <sup>1</sup>	-	-	-	-	3.5	-	5	8.5

NOTES:

<sup>1</sup> Unit of measurement is number of miles.

Table A.4. - ORV/Enduro Trails

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total
Bicycle Route <sup>1</sup>	1	4	18	31	65	92	-	211
Bicycle Route to Seashore <sup>1</sup>	12	8	7	41	41	54	-	163
Hiking Trail <sup>1</sup>	-	-	23.5	6	15	105	17	149.5
Hiking - Nature Trail <sup>1</sup>	-	-	-	-	9	7	-	16
Hiking - Batona Trail <sup>1</sup>	-	-	-	-	-	39	-	39
Hiking/Horse Trail <sup>1</sup>	-	-	-	-	-	16	-	16

NOTES:

<sup>1</sup> Unit of measurement is number of miles.

Table A.5. - Bicycling/Hiking/Horsebackriding

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total
Boat Launch, Ramp <sup>1</sup>	1	2	-	4	3	-	3	13
Boat Launch, Car-top <sup>1</sup>	-	2	-	2	-	1	3	8
Canoe Livery <sup>1</sup>	-	-	-	1	5	6	2	14
Marina Dock <sup>1</sup>	-	7	-	1	-	-	1	9
River Access Point <sup>1</sup>	1	-	1	-	10	25	11	48
Swimming <sup>1</sup>	1	-	-	1	4	4	1	11
Fishing - Salt Water (Locations) <sup>1</sup>	-	2	-	-	1	-	2	5
Rowing Club Boat House <sup>1</sup>	-	-	-	-	1	-	-	1
Canoeing River <sup>2</sup>	-	-	4 <sup>3</sup>	-	20 <sup>4</sup>	67 <sup>3,4</sup>	23	114
Canoeing Lake <sup>1</sup>	-	-	1	-	1	2	3	7
Fishing River <sup>2</sup>	4.5 <sup>5</sup>	2 <sup>6</sup>	4.5 <sup>5</sup>	15.5 <sup>7</sup>	13.5 <sup>8,7,8,</sup>	9 <sup>8</sup>	.5	49.5
Fishing Lake <sup>1/9</sup>	-	4/24 <sup>5</sup>	2/23 <sup>6</sup>	5/35 <sup>3</sup>	5/63 <sup>1</sup>	5/29 <sup>7</sup>	6/58 <sup>2</sup>	27/213 <sup>1</sup>
Fishing, Limited <sup>2</sup>	-	-	6 <sup>10</sup>	-	7 <sup>11</sup>	46 <sup>10,11</sup>	-	59
National Recreation River Study Candidate <sup>2</sup>	-	12 <sup>12</sup>	11.5	20 <sup>12,13</sup>	24 <sup>13</sup>	24	41	132.5
Canoeing River, Seasonal <sup>2</sup>	7.5 <sup>14</sup>	-	7.5 <sup>14</sup>	-	8	-	-	23
Water Wacking River Route <sup>2</sup>	-	-	-	-	-	7	-	7
Beach - Fresh Water <sup>1</sup>	-	-	1	-	2	1	-	4
Beach - Salt Water <sup>2</sup>	-	-	-	-	5	-	9	14
Shellfishing <sup>9</sup>	-	-	-	-	16000	-	46720	62720

NOTES:

<sup>1</sup> Unit of measurement is number present.

<sup>2</sup> Unit of measurement is number of miles.

<sup>3</sup> 4.0 miles common to Camden and Burlington Counties.

<sup>4</sup> 10.0 miles common to Atlantic and Burlington Counties.

<sup>5</sup> Boundary common to Gloucester and Camden Counties.

<sup>6</sup> Boundary common to Cumberland and Atlantic Counties.

<sup>7</sup> 8.5 miles common to Cape May and Atlantic Counties.

<sup>8</sup> 3.0 miles common to Atlantic and Burlington Counties.

<sup>9</sup> Unit of measurement is acres.

<sup>10</sup> 6.0 miles common to Camden and Burlington Counties.

<sup>11</sup> Boundary common to Atlantic and Burlington Counties.

<sup>12</sup> 5.0 miles common to Cumberland and Cape May Counties.

<sup>13</sup> 8.0 miles common to Cape May and Atlantic Counties.

<sup>14</sup> Boundary common to Gloucester and Camden Counties.

Table A.6. - Water-based Recreational Resources/Facilities

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total
Camps - Boy/Girl Scout, Church, YMCA, etc. <sup>1</sup>	1	2	1	1	3	5	1	13
Campground Campsite <sup>*1</sup>	-	-	1	3	2	11	6	23
Campground with Hook-up <sup>1/2</sup>	6/450	2/165	1/100	24/6525	19/2595	9/1491	10/1538	71/12864

\*See below for further breakdowns.

#### STATE FOREST CAMPGROUNDS

<u>Forest</u>	<u>County</u>	<u>Sites</u>	<u>Cabins Lean-tos</u>
Bass River	Burlington	178	6
Belleplain	Cape May	194	12
Lebanon	Burlington	93	-
Wharton	Burlington	<u>75</u>	<u>8</u>
		540	26

#### STATE FOREST PRIMITIVE CAMPS

<u>Forest</u>	<u>County</u>	<u>Number of Primitive Camps</u>	<u>Total Capacity</u>
Wharton	Burlington	7 <sup>**</sup>	1225 persons

<sup>\*\*</sup>Two (2) campsites not accessible by car (Mullica River and Lower Forge Camps)

#### NOTES:

<sup>1</sup> Unit of measurement is number present.

<sup>2</sup> Unit of measurement is number of campsites.

Table A.7. - Camping Facilities



	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pinelands Total	A.11
Environmental Center <sup>1/2</sup>	-	-	-	-	-	1/63	1/- <sup>3</sup>	2/63	
Natural Area - National Natural Landmark <sup>1/2</sup>	-	-	-	-	-	-	1/64	1/64	
Natural Area - State Designated <sup>1</sup> (See Public and Quasi- Public Lands for acreages.)	-	-	-	-	2	5	3	10	
Natural Area - State Non-designated <sup>1</sup>	-	-	-	-	1	-	-	1	
Sportsmen/Hunting Clubs <sup>1/2</sup>	3/449	1/- <sup>3</sup>	5/23.5	3/423.8	32/191.6	76/528.9	36/399.5	156/2016.3	
Wildlife Refuge - Private <sup>1/2</sup>	1/38.2	-	-	-	-	1/154	-	2/192.2	

NOTES:

<sup>1</sup> Unit of measurement is number present.

<sup>2</sup> Unit of measurement is acres.

<sup>3</sup> Acreage not estimated.

Table A.8. - Extensive Natural Recreation Areas

	Gloucester	Cumberland	Camden	Cape May	Atlantic	Burlington	Ocean	Pine lands Total
Antique Alley <sup>1</sup>	-	-	-	-	-	-	19.5	19.5
Amusement/Theme Park <sup>2</sup>	-	-	-	-	-	-	-	-
Dragway <sup>2</sup>	-	-	-	-	-	-	-	-
Golf Course <sup>2</sup>	-	-	-	-	5	3	6	15
Gardens <sup>2</sup>	-	-	-	-	-	-	-	-
Memorial <sup>2</sup>	-	-	-	-	-	-	-	-
Museum <sup>2</sup>	-	-	-	-	-	-	-	-
Picnic Area <sup>2</sup>	1	-	-	-	1	3	3	8
Picnic/Rest Area <sup>2</sup>	1	-	-	1	5	4	2	13
Point of Interest - Man-made <sup>2</sup>	-	-	-	-	3	3	1	7
Point of Interest - Natural <sup>2</sup>	-	-	-	-	-	1	-	1
Racetrack - Horse Racing <sup>2</sup>	-	-	-	-	1	-	-	1
Railroad - Abandoned <sup>1</sup>	-	8.5	-	14	20	-	-	42.5
Rights-of-way (Utility) <sup>1</sup>	27	11	22	42	51	46	74	273
Tours - Military Base <sup>2</sup>	-	-	-	-	1	1	1	3
Winery <sup>2</sup>	-	-	-	-	3	-	-	3
Recreational Road - open <sup>1</sup>	-	3	44	30	18	446	24	565
Recreational Road - Intermittent <sup>1</sup>	-	.5	-	2	1.5	16	1	21
Nudist Camp <sup>2</sup>	-	-	-	-	1	-	-	1

NOTES:

<sup>1</sup> Unit of measurement is number of miles.

<sup>2</sup> Unit of measurement is number present.

Table A.9. - Miscellaneous Recreational Resources/Facilities

**APPENDIX B: CHARACTERISTICS OF PINELANDS RECREATIONAL USERS AND USES**

## Users Uses Profile

In this study Pinelands recreational uses were inventoried as part of an extensive literature search; numerous interviews with recreational participants, providers and planners; and visits to the Pinelands, itself, for first-hand observations and data collection. A detailed survey of Pinelands recreational users was not undertaken, nor was one available from another source. As a result, many sources were investigated, and reported upon, herein, which have analyzed recreational activities peculiar to the Pinelands. The principle source for most statistical information was the 1977 New Jersey Statewide Comprehensive Outdoor Recreation Plan (SCORP) and the associated New Jersey Outdoor Recreation Demand Study. The latter incorporated a survey of both in-state and out-of-state participants in New Jersey recreational activities conducted in 1975, which was reported in Volume II, Detailed Tabulation Tables. Of the fifty-six (56) recreational activities reported upon in that study, twenty-six (26) were identified as 'Pinelands' activities. Figure B.1 serves to identify the inter-relationship between these activities and participants in them in an attempt to characterize Pinelands recreation users and uses. It is discussed in detail in the following sections.

### Pinelands Recreational Users

Both user and use characteristics are presented in Figure B.1 as percentages. User characteristics are presented as the 'denominator' and may be read from left to right for the nine (9) socioeconomic characteristics (residence, race, income, education, occupation, marital status, available leisure time, sex and age). They report what percentage of respondents in each category from the Statewide survey indicated they participate in a particular activity. Thus, 37 percent of the apartment dwellers and 53 percent of the blue collar workers participate in bicycling. Reading the activity columns from top to bottom provides a socioeconomic profile for each recreational use. Thus, 6 percent of the bicyclists surveyed live in apartments and 34 percent are blue collar workers. A summary of all respondents (users) is reported as 'Total Surveyed' and all activities (uses) as 'All Pinelands Activities.'

Among the more frequently mentioned activities are bicycling (50 percent), driving for pleasure (51 percent), saltwater swimming (45 percent), and freshwater swimming (34 percent). Of the four fishing categories, saltwater boat fishing (20 percent) was most frequently mentioned, while freshwater boat fishing and shore fishing were mentioned by 6 percent and 7 percent of the respondents, respectively. Among some other activities more typically associated with the Pinelands, canoeing was mentioned by 5 percent, trail hiking by 9 percent, tent camping (car access) by 8 percent, and trailer camping by 5 percent. Although trapping is also recognized as a recreational activity in the Pinelands, there were too few responses to the Demand Study Survey for this activity to produce statistically reliable participation results.

Responses summarized for 'All Pinelands Activities' indicate that most participants are white (90 percent), live in single family homes (74 percent) and approximately one-third have family incomes over \$20,000 (1975 dollars). Thirty-four percent held blue collar jobs and 36 percent held managerial or professional jobs. The overwhelming majority of the surveyed participants in Pineland activities were married (82 percent) and 41 percent were between 35 and 54 years of age. Weekly available leisure time was almost evenly distributed among 0-9, 10-19, 20-29 and 30 hours.

**Figure B.1. Pinelands Recreational User/Uses Characteristic Matrix<sup>1</sup>**

SOCIOECONOMIC CHARACTERISTICS <sup>3</sup>		ACTIVITIES <sup>2</sup> :																												All Pinelands Activities
Residence		Bicycling	Birdwatching	Boating, freshwater, motor	Boating, saltwater, motor	Boating, sail	Camping, tent, access by car	Camping, trailer camper	Canoeing	Driving for pleasure	Fishing, freshwater, boat	Fishing, freshwater, shore	Fishing, saltwater, boat	Fishing, saltwater, shore	Harvesting/picking	Hiking, nature walk	Hiking, trail	Historic site visiting	Horsebackriding	Hunting, upland, small game	Picnicking with family	Picnicking with large group	Sunbathing	Swimming, freshwater/public pool	Swimming, saltwater	Trail biking	Wading			
Single Family	1-4 Ac	40/54	32/6	24/4	35/13	27/3	38/8	38/5	28/4	38/52	32/5	49/9	38/20	45/13	37/10	31/11	29/7	34/25	28/10	27/3	48/43	37/23	35/31	34/31	39/48	37/3	41/9	37		
Single Family	1-4 Ac	37/60	44/10	51/10	40/17	61/8	43/11	37/6	48/8	33/55	52/10	27/6	36/23	37/13	49/16	43/18	44/13	41/36	43/18	46/6	32/42	31/23	39/42	36/40	34/50	41/4	38/10	37		
Apartment		6/37	7/6	7/5	5/8	2/1	12/11	19/11	17/10	8/45	11/8	4/3	9/22	7/9	7/8	10/15	11/12	10/30	10/15	15/7	7/34	9/23	9/34	9/35	9/48	9/3	7/7	8		
Townhouse	Other	17/38	19/6	24/6	19/10	12/2	8/3	12/3	10/2	20/46	3/1	15/5	17/16	13/7	9/4	16/9	13/5	16/19	21/12	18/3	20/35	25/25	18/26	20/30	17/34	23/3	14/5	17		
Race																														
White		89/51	99/8	99/7	94/14	99/5	99/9	99/7	99/7	87/51	88/6	88/7	97/22	96/12	96/11	94/14	97/10	91/28	87/13	99/5	87/40	84/22	95/36	87/34	91/47	87/3	87/8	90		
Non-white		10/45	3/2	8/4	2/2	1/3	2/2	-/-	-/-	10/45	4/2	5/3	5/0	5/5	5/4	8/0	3/2	10/24	11/12	3/1	12/40	16/32	6/17	19/30	7/25	12/3	14/10	8		
Income																														
0 -	6,000	5/24	14/9	11/6	7/7	14/5	4/3	4/2	11/5	8/39	-/-	11/6	3/6	2/2	11/10	8/9	5/4	6/14	6/7	5/2	7/26	10/20	6/17	6/17	8/31	7/2	7/5	7		
6,000 -	10,000	10/47	6/4	12/7	6/7	10/4	10/8	18/9	6/3	9/43	8/5	5/3	7/15	12/14	8/8	10/13	7/6	9/24	10/13	13/5	9/36	13/30	9/34	11/35	10/45	14/4	15/9	9		
10,000 -	15,000	17/47	13/5	19/6	27/18	5/1	24/11	17/5	15/4	21/59	11/4	17/6	20/27	30/21	18/10	21/15	18/9	18/26	20/14	24/5	20/45	20/25	19/34	19/35	18/45	24/4	20/9	18		

Figure 8.1. Pinelands Recreational User/Uses Characteristic Matrix<sup>1</sup>(cont'd.)

SOCIOECONOMIC CHARACTERISTICS <sup>3</sup> (cont'd.)		ACTIVITIES <sup>2</sup> :																												All Pinelands Activities
		Bicycling	Birdwatching	Boating, freshwater, motor	Boating, saltwater, motor	Boating, sail	Camping, tent, access by car	Camping, trailer camper	Canoeing	Driving for pleasure	Fishing, freshwater, boat	Fishing, freshwater, shore	Fishing, saltwater, boat	Fishing, saltwater, shore	Harvesting/Picking	Hiking, nature walk	Hiking, trail	Historic site visiting	Horsebackriding	Hunting, upland small game	Picnicking with family	Picnicking with large group	Sunbathing	Swimming, freshwater/public pool	Swimming, saltwater	Trail biking	Wading			
Marital Status		84/53	79/7	82/6	88/14	82/4	77/8	92/6	82/5	81/52	77/6	66/6	88/23	91/13	87/11	79/13	71/8	82/28	79/13	99/5	85/43	76/22	84/35	82/35	81/46	79/3	89/9	82		
Single		9/54	11/9	15/13	6/11	14/8	13/11	12/6	14/10	9/55	7/4	11/8	6/12	6/7	8/10	16/24	18/19	10/32	10/16	3/2	4/18	12/32	10/38	10/42	9/49	14/5	7/7	9		
Separated, etc.		7/28	15/9	4/2	7/8	11/4	13/8	5/2	6/3	8/36	11/5	17/9	5/8	5/4	9/8	8/9	7/5	9/22	9/10	2/1	10/33	14/26	7/20	7/20	9/42	16/5	7/5	8		
Available Leisure Time																														
0 - 9 Hours week		29/53	35/9	27/6	25/12	41/6	34/10	22/4	22/4	25/46	32/7	18/4	29/24	20/9	25/9	30/14	18/6	27/27	29/14	34/5	28/41	27/23	27/33	25/31	27/45	9/1	21/6	26		
10 - 19 Hours week		26/52	27/7	28/6	28/13	21/3	29/9	31/6	28/5	28/53	21/5	21/5	24/22	26/12	30/11	23/11	24/8	31/31	27/13	28/4	29/43	29/25	27/34	31/39	27/45	18/2	24/7	27		
20 - 29 Hours week		20/53	15/5	17/5	21/13	26/5	25/10	24/6	12/3	23/58	17/5	27/8	24/27	30/18	23/11	24/15	25/11	22/29	22/14	21/4	21/41	20/22	24/39	22/37	23/50	34/5	26/10	22		
30+		18/50	17/7	30/10	25/18	27/5	19/9	7/2	36/10	19/55	22/8	28/10	20/27	25/18	24/14	21/16	29/15	21/32	17/13	23/5	17/40	20/27	18/34	18/35	18/47	35/6	28/13	19		
Sex																														
Male		47/49	41/6	62/8	57/16	58/5	49/8	40/4	65/7	49/52	58/7	43/6	49/21	50/11	39/8	48/13	53/10	50/28	44/12	58/5	47/31	48/23	47/32	47/33	51/48	64/4	42/7	48		
Female		53/51	67/9	44/5	41/10	53/4	50/8	60/6	42/4	51/50	34/4	50/7	50/28	50/11	62/12	56/14	40/7	51/27	56/14	40/3	53/41	52/23	55/35	52/34	48/42	35/2	58/9	53		

Figure B.1. Pinelands Recreational User/Uses Characteristic Matrix(cont'd.)

SOCIOECONOMIC CHARACTERISTICS <sup>2</sup> (cont'd.)		ACTIVITIES <sup>2</sup> :																												All Pinelands Activities
Income (cont'd.)		Bicycling	Birdwatching	Boating, freshwater, motor	Boating, saltwater, motor	Boating, sail	Camping, tent, access by car	Camping, trailer camper	Canoeing	Driving for pleasure	Fishing, freshwater, boat	Fishing, freshwater, shore	Fishing, saltwater, boat	Fishing, saltwater, shore	Harvesting/Picking	Hiking, nature walk	Hiking, trail	Historic site visiting	Horsebackriding	Hunting, upland, small game	Picnicking with family	Picnicking with large group	Sunbathing	Swimming, freshwater/public pool	Swimming, saltwater	Trail biking	Wading			
15,000 - 20,000		17 56	26 12	24 10	20 18	11 3	25 12	20 7	17 7	19 73	30 11	30 11	19 26	18 13	19 12	22 18	22 13	21 36	15 13	25 7	17 45	13 19	19 41	17 38	19 56	21 4	21 11	18 —		
20,000+		34 72	30 9	20 5	27 15	41 7	24 8	28 6	37 8	24 52	44 11	16 4	37 36	26 13	33 14	29 16	31 12	31 36	29 16	18 3	27 45	28 27	31 44	29 42	26 50	24 3	24 8	29 —		
Education																														
Less than high school		13 33	11 4	16 5	16 11	- -	2 1	20 5	11 3	17 44	10 3	17 6	15 15	14 8	15 8	9 6	6 3	11 16	10 7	9 2	16 34	15 18	13 22	11 19	13 31	19 3	14 6	13 —		
High school		38 49	44 8	44 7	41 14	38 4	34 7	47 6	30 4	41 54	39 6	39 7	41 21	46 13	39 10	39 13	30 7	36 25	45 15	67 7	42 43	39 23	39 33	40 35	40 46	51 4	43 9	39 —		
Greater than high school		47 64	42 8	44 7	41 14	27 8	63 14	29 —	68 9	39 54	42 7	31 6	40 22	36 11	48 13	51 18	58 14	52 38	43 15	28 3	38 41	45 28	48 43	46 42	44 53	37 3	46 10	44 —		
Occupation																														
Professional Managerial		39 67	38 9	24 5	31 14	51 7	40 11	23 4	41 7	32 56	44 9	24 5	38 30	37 15	38 13	38 17	39 12	41 38	34 15	15 2	31 42	34 27	42 47	40 46	34 53	29 3	33 9	36 —		
Sales Clerical		16 59	19 10	18 8	16 15	17 5	13 8	8 3	16 6	15 57	- -	7 3	6 11	8 7	12 9	17 16	15 10	15 30	12 12	3 1	11 34	15 25	14 35	15 38	16 55	13 3	17 10	14 —		
Blue Collar		34 53	22 7	49 9	38 15	24 3	51 13	63 10	33 5	34 54	42 8	42 10	38 38	45 17	38 12	30 12	36 10	30 25	42 17	73 9	38 47	35 25	32 33	31 33	33 46	53 5	40 10	34 —		
Unemployed		8 19	23 8	13 4	14 9	15 3	5 2	8 2	12 3	16 39	7 2	14 4	11 12	11 6	14 7	14 9	7 3	14 19	8 5	5 1	16 31	15 17	10 16	10 17	11 25	7 1	13 5	12 —		

**Figure B.1. Pinelands Recreational User/Uses Characteristic Matrix<sup>2</sup>(cont'd.)**

SOCIOECONOMIC CHARACTERISTICS <sup>3</sup> (cont'd.)		ACTIVITIES <sup>2</sup> :																												All Pinelands Activities
Age		Bicycling	Birdwatching	Boating, freshwater, motor	Boating, saltwater, motor	Boating, sail	Camping, tent, access by car	Camping, trailer camper	Canoeing	Driving for pleasure	Fishing, freshwater, boat	Fishing, freshwater, shore	Fishing, saltwater, boat	Fishing, saltwater, shore	Harvesting/Picking	Hiking, nature walk	Hiking, trail	Historic site visiting	Horsebackriding	Hunting, upland, small game	Picnicking with family	Picnicking with large group	Sunbathing	Swimming, freshwater/public pool	Swimming, saltwater	Trail biking	Wading			
18 - 24		8/54	4/4	15/12	3/6	17/9	16/16	26/15	22/57	9/10	13/19	22/17	7/13	9/13	10/22	13/22	15/18	9/30	14/24	15/8	6/32	10/29	9/38	10/45	9/53	21/8	13/13	9/1		
25 - 34		30/67	16/5	22/6	32/19	22/4	39/14	22/5	31/7	25/58	30/8	22/7	29/26	34/17	27/12	31/18	37/15	27/33	32/19	33/6	27/48	32/33	32/47	30/45	28/56	22/3	33/12	28/1		
35 - 54		48/63	44/8	47/7	43/4	60/6	41/9	37/5	48/6	38/58	25/4	32/6	41/22	34/10	42/11	38/13	38/9	43/30	47/16	50/5	39/41	38/23	44/38	42/37	44/51	51/4	38/8	41/1		
55+		11/19	37/9	18/4	21/10	14/2	11/3	18/3	5/1	26/46	25/5	17/4	23/15	19/7	20/7	20/9	6/2	22/21	4/2	-/1	24/34	19/15	16/8	14/17	17/27	10/1	18/5	19/1		
Total Surveyed		50	7	6	13	4	8	5	5	51	6	7	20	11	14	13	9	27	11	4	40	23	33	34	45	3	8			

**NOTES:**

<sup>1</sup> Numbers are percentages. Use characteristics are expressed as the 'numerator' and user characteristics as the 'denominator'.

$$^2 \text{ Use Characteristics} = \frac{\text{Respondents in socioeconomic category that participate in each activity}}{\text{Total respondents that participate in each activity}}$$
$$^a \text{ User Characteristics} = \frac{\text{Respondents in socioeconomic category that participate in each activity}}{\text{Total respondents in socioeconomic category}}$$

Source: New Jersey Department of Environmental Protection, "New Jersey Outdoor Recreation Demand Study, Volume 2 - Detailed Tabulation Tables," 1976. This volume tabulates the results of an outdoor recreation survey of New Jersey residents conducted in 1975.



### Resident Non-resident Participation and Distance Traveled

Out-of-state residents are responsible for nearly 7 percent of New Jersey's total recreational demand according to the 1977 SCORP. However, State averages specific to Pinelands activities indicate that out-of-state resident participation is significantly higher, at 10 percent, as presented in Table B.1. (Estimates of total activity occasions in the Pinelands, discussed later in this report, indicate that total out-of-state participation is probably closer to 14 percent.) Although the origin of out-of-state participation is not reported, the SCORP found that an average of 60 percent of the out-of-state recreational participants were from adjacent counties in New York and Pennsylvania. Both canoeing and saltwater swimming, with 50 percent and 49 percent respectively, are characterized by the highest rates of out-of-state participation. Other activities with high levels of out-of-state participation include sailboating (35 percent), both tent and trailer camping (31 percent and 32 percent) and freshwater and saltwater fishing (22 and 25 percent).

The 1967 New Jersey State Park Visitor Use Survey reports corroborative findings (See Table B.2). Overall, it reports that out-of-state residents accounted for 24 percent of park visitation. The two State facilities surveyed within the study area, Wharton State Forest and Island Beach State Park, received 37 and 18 percent, respectively. These higher rates are reflective of the types of activities associated with these facilities. Wharton State Forest offers camping, canoeing and hiking, activities which typically involve greater than average out-of-state participation. Although Island Beach State Park appears to receive fewer out-of-state visitors than may be expected from participation rates estimated for saltwater swimming, the park offers no overnite facilities and, thus, is likely to attract more nearby day visitors from within the State.

The Cape May County Planning Board reported in its 1976 Campground Study that 56 percent of the campground users are out-of-state residents. Although this is significantly higher than the 32 percent reported in the 1977 SCORP, it is indicative of the shore influence on recreational participation in Cape May County.

Another analysis concept pertinent to an understanding of where users come from to participate in recreational activities, is 'home' and 'away' use. Table B.3 is from the New Jersey State Park Visitor Use Study (1966-1967). It compares data developed for the study with data presented in the 1966 New Jersey SCORP. The definition of 'home' and 'away' use was based upon eight New Jersey study regions developed for the 1966 SCORP data inventory. In general, 'away' use is much higher for the Park Use Study. The difference is attributed to the 'away visitors' familiarity with State Parks and Forests and the local or regional users desire to frequent areas less familiar to the general public, and thus less crowded. The one exception, camping, was due to an erroneous assumption made in the 1966 SCORP that camping is related only to 'away' demand. The findings clearly indicate, however, that a considerable proportion of recreational participation results from residents traveling away from their home region, if not from out-of-state.

### Organized, Family and Solitary Recreation

There is little information in the New Jersey Outdoor Recreation Demand Study to indicate the size or type of the typical recreation party. Survey responses for picnicking, however, indicate that the family group is more common. Overall, 40 percent of the respondents picnic with the family, while 23 percent said they picnic with large groups. In fact, among all socioeconomic categories, only the 'single' respondents mentioned 'picnicking with large groups' more frequently than family participation.

<u>Activities</u>	<u>Percent of Total State Participation</u>	<u>Percent of total Pinelands County Participation</u>
Bicycling	3	- <sup>1</sup>
Birdwatching	- <sup>2</sup>	- <sup>2</sup>
Boating, freshwater, motor	14	15
Boating, saltwater, motor	12	13
Boating, sail	35	38
Camping, tent (car access)	31	30
Camping, trailer camper	32	33
Canoeing	50	55
Driving for pleasure	1	- <sup>1</sup>
Fishing, freshwater, boat	22	23
Fishing, freshwater, shore	22	24
Fishing, saltwater, boat	25	26
Fishing, saltwater, shore	25	27
Harvesting/Picking	1 <sup>2</sup>	- <sup>2</sup>
Hiking, nature walk	17	- <sup>1</sup>
Hiking, trail	19	19
Historic site visiting	1	- <sup>1</sup>
Horsebackriding	4	- <sup>1</sup>
Hunting, small game	2	2
Picnicking, with family	10	9
Picnicking, with large group	10	10
Sunbathing	- <sup>2</sup>	- <sup>2</sup>
Swimming, freshwater	7	4
Swimming, saltwater	49	50
Trail biking	4	- <sup>1</sup>
Wading	- <sup>2</sup>	- <sup>2</sup>
Pinelands Activities	10	

## NOTES:

<sup>1</sup> Only state totals estimated<sup>2</sup> Unestimated

Source: New Jersey Department of Environmental Protection, "New Jersey Outdoor Recreation Demand Study," Volume 1, Table 2: Summary of Recreation Participation by County and Activity, 1976.

Table B.1 Out-of-State Recreation Participation

Table B.2 Visitor Origins (in Percent)

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks					Total Mean
	Hopat- cong	Ring- wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire	Sub- mean	
In-state	75.7	64.5	72.0	71.2	91.1	82.2	87.2	63.3	51.5	67.6	88.4	66.0	76.3
Out-of-state	24.3	35.5	28.0	28.8	8.9	17.8	12.8	36.7	48.4	32.4	11.6	34.0	23.7
Number Samples	103	90	193	386	514	587	1101	30	361	284	215	890	2377

Source: New Jersey Department of Conservation and Economic Development, "New Jersey Park Visitor Use Survey, 1966-1967," page 30.

<u>Activity</u>	<u>1966 Demand</u>			<u>1966-1967 Park Use</u>		
	<u>Home</u>	<u>Away</u>	<u>Percent Away</u>	<u>Home</u>	<u>Away</u>	<u>Percent Away</u>
Swimming	252,600	445,000	64	229	980	81
Picnicking	112,600	147,700	57	128	362	74
Camping	0	46,400	100	34	196	85
Sightseeing	81,000	128,700	61	25	138	85
Fishing	30,200	149,800	83	22	112	84
Outdoor Games	215,500	137,200	39	5	30	86
Walking for Pleasure	367,900	172,900	32	7	13	65
Driving for Pleasure	351,400	272,100	44	3	14	82
Nature Walks	41,200	63,300	61	3	7	70
Other Boating	52,200	88,700	63	3	5	86

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Study, 1966-1967," page 6

Table B.3 Comparison Between New Jersey Comprehensive Plan Away Data (1966) and Park Study Away Data (1966-1967) in Persons Per Day

Evidence from the New Jersey State Park Visitor Use Survey supports the significance of the family as a recreational party. Tables B.4 and B.5, from that Survey report, indicate who State Park visitors arrived with and the size of the party. For all State Parks, 69.4 percent arrived with a 'family group' and 7.8 percent arrived with a 'family and friend'. Almost 4 percent arrived alone and 16 percent arrived with friends. Only 3.2 percent of the surveyed visitors arrived with an organized group. This pattern is mimicked in the two Pinelands State facilities included in the Survey, although significantly fewer Island Beach State Park visitors arrived with organized groups (0.7 percent). (The small sample size - 32 respondents - at Wharton State Forest probably explains why only two categories are reported.) The survey report concludes that the higher percentage of 'family group' and 'family and friend' responses at Parvin and Cheesequake State Parks reflects a larger proportion of campers surveyed at these facilities.

Table B.5, Size of Party, reports a fairly even total mean distribution of responses for parties of 2, 3, 4, 5, and 6 persons; although at Island Beach State Park, significantly more visitors arrived in two (2) person parties. Responses for Wharton State Forest loosely conform to this pattern, but again, the Wharton sample size is much smaller.

#### Seasonality, Length of Use and Peak Use

Of the four (4) most popular Pinelands activities - bicycling, driving for pleasure, picnicking and saltwater swimming - only saltwater swimming is an exclusively summer-time activity. Although participation in most other activities is certainly greatly reduced during the winter months, outdoor recreation is a year-round phenomenon in the Pinelands. Even camping facilities in the State Parks and Forests remain open all season, as do a few of the private facilities. Most other private campgrounds are open from April through October, but their primary business months are June through September. Participation in hunting and trapping, however, is subject to regulated seasons, contingent upon the type of hunting being pursued.

Not only may recreational participation be concentrated during a particular season, it may also be more likely to occur on the weekend or on a specific day or holiday. Table B.6 presents a summary of the 1972 National Recreational Survey. It is evident for all the activities listed that participation generally occurs on weekends. Among some of the more popular weekend activities are 'camping in remote or wilderness areas' (80 percent), sailing (75 percent) and birdwatching (75 percent). Weekend participation rates for other popular Pinelands activities are: picnicking - 71 percent, swimming outdoors - 60 percent, bicycling - 69 percent, and sightseeing - 62 percent. When asked when they participated in their four (4) most popular recreational activities, 90 percent of the respondents in the New Jersey Recreational Demand Study Survey said weekends and 61 percent weekdays. (Obviously, many participate on both weekends and weekdays.) The responses reported by activity indicate that weekend participation was mentioned by 100 percent of the campers, 88 percent of the bicyclists, 83 percent of the fishermen and 91 percent of the swimmers. Weekday rates include campers - 29 percent, bicyclists - 76 percent, fishermen - 50 percent, and swimmers - 64 percent. (Limited responses prevented the calculation of weekend weekday participation rates for other Pinelands activities from the Demand Study data.)

The estimated percentage of total annual participation in various activities that occurs on one peak day, or weekend is also reported in the SCORP. These percentages for Pinelands activities are presented in Table B.7. If the total activity occasions for a given activity did not experience peak periods but were distributed throughout a four (4) month summer season, activity occasions would represent

Table B.4 Party Arrived With

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks					Total Mean
	Hopat- cong	Ring- wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire	Sub- mean	
Just you alone	.0	5.9	2.2	2.4	5.6	4.9	5.2		.6	2.6	5.0	2.0	3.6
Family group	61.0	60.0	66.3	63.8	67.3	70.0	68.8	77.7	72.6	75.0	68.0	73.0	69.4
Family and friend	2.0	1.2	5.2	3.6	6.6	7.4	7.0		12.4	11.8	7.2	10.8	7.8
Friend or friends	29.0	28.2	19.8	23.7	19.3	17.0	18.1	22.3	5.9	7.4	19.8	9.5	16.0
Organized group	8.0	4.7	6.5	6.5	1.2	.7	.9		8.5	3.2	.0	4.7	3.2
Number samples	100	85	232	417	517	593	1110	36	355	312	141	844	2371

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Survey, 1966-1967"

Table 8.5 Size of Party

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks					Total Mean
	Hopat- cong	Ring- wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire	Sub- mean	
1	10.2	12.2	.0	5.3	5.6	0.0	2.8	.0	.0	.0	6.2	.9	2.6
2	24.7	7.8	21.2	18.3	18.2	22.9	20.6	9.4	7.0	13.0	3.6	9.0	16.2
3	23.6	12.2	9.6	13.2	16.1	10.8	13.4	12.6	12.5	8.8	8.0	10.3	12.3
4	11.2	20.0	25.9	21.3	17.4	19.3	18.4	3.1	15.1	18.0	18.8	16.3	18.2
5	7.9	12.2	11.8	11.1	14.8	18.4	16.6	25.0	18.9	17.2	17.9	18.5	16.2
6	4.6	12.2	12.8	10.9	11.2	11.7	11.5	21.9	12.2	16.0	18.8	15.1	12.6
7	.0	7.0	7.0	5.6	5.4	5.9	5.6	6.2	7.4	6.8	7.1	7.0	6.1
8	2.2	2.6	2.6	2.5	3.9	3.6	3.7	6.2	7.7	6.0	8.9	7.1	4.8
9	2.2	2.6	2.6	2.5	2.1	2.6	2.4	.0	5.4	3.7	.9	3.8	2.9
10-20	11.2	5.2	3.9	5.8	4.5	4.4	4.4	15.6	13.8	8.8	9.8	11.2	7.0
21-50	.0	.0	2.6	1.4	.6	0.0	.3	.0	.0	1.7	.0	.7	.6
51+	2.2	6.0	.0	2.1	.2	.4	.3	.0	.0	.0	.0	.0	.5
Number Samples	89	115	228	432	516	528	1044	32	312	300	112	756	2232

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Survey, 1966-1967"

Table B.6 Percent of National Recreation Survey Who Participated, Estimated Total U.S. Participation, Percent of Recreation Occurring on Weekends and Average Hours of Participation per Activity Day by Activity for the Summer Quarter of 1972.

Activity	Percent of NRS Respondents Who Participated	Estimated Total U.S. Participation for the Summer Quarter of 1972 (Millions of Act. Days)	Percent of Total Activity Which Occurred on Weekends	Average Number of Hours of Participation Per Activity Day
Picnicking	47	405.1 <sup>1</sup>	71	2.7
Sightseeing	37	362.8 <sup>1</sup>	62	3.1
Driving for Pleasure	34	404.9 <sup>1</sup>	- <sup>2</sup>	- <sup>2</sup>
Walking for Pleasure	34	496.3 <sup>1</sup>	64	1.9
Other Swimming Outdoors	34	487.1 <sup>1</sup>	69	2.6
Visiting zoos, fairs, etc.	24	122.5	55	4.5
Other activities	24	242.9 <sup>1</sup>	- <sup>2</sup>	- <sup>2</sup>
Fishing	24	278.2 <sup>1</sup>	68	4.4
Playing other outdoor games or sports	22	338.8 <sup>1</sup>	65	2.6
Outdoor pool swimming	18	257.0 <sup>1</sup>	52	2.8
Nature walks	17	148.9	70	2.0
Other boating	15	126.1	74	2.8
Going to outdoor sports events	12	96.9	57	4.2
Camping in campgrounds	11	153.3	62	- <sup>3</sup>
Bicycling	10	214.2	69	2.0
Going to outdoor concerts, etc.	7	26.5	66	3.6
Horsebackriding	5	51.5	51	2.7
Hiking	5	45.0	62	3.0
Tennis	5	81.2	79	2.1
Water skiing	5	54.1	69	2.6
Golf	5	63.4	51	4.9 <sup>3</sup>
Camping - wilderness	5	57.5	80	- <sup>3</sup>
Motorcycling - off-the-road	5	58.2	62	4.0
Birdwatching	4	42.0	75	2.1
Canoeing	3	18.3	72	2.3
Sailing	3	32.5	75	4.4
Hunting	3	17.5	64	4.4
Wildlife and bird photography	2	19.6	56	1.6
Driving 4-wheel vehicles	2	26.6	56	3.1

NOTES:

Statistically reliable within ten percent

Was not compiled from NRS

Defined to be one activity day

Source: U.S. Department of the Interior, Bureau of Outdoor Recreation, "Outdoor Recreation: A Legacy for America," Appendix "A", 1973.



<u>Activity</u>	<u>Percent of Total Use</u>
Trail Hiking	1.5
Nature Walks	1.5
Birdwatching	1.6
Bicycling	0.9
Trail Biking	0.8
Swimming - Freshwater	2.4
public pools	2.4
Swimming - Saltwater	2.7
Wading	2.4
Sunbathing	-.1
Camping - Trailer/Camper	1.5
Tent Camping - Access by car	1.5
Hunting	1.3
Horsebackriding	1.6
Harvesting Picking	-.1
Driving for Pleasure	-.1
Visiting Historic Sites	1.5
Sail Boating	1.9
Motor Boating - Freshwater	1.9
Motor Boating - saltwater	1.9 <sup>2</sup>
Canoeing	1.8 <sup>2</sup>
Saltwater - Boat fishing	1.7 <sup>2</sup>
Freshwater - Boat fishing	1.7 <sup>2</sup>
Saltwater - Shore fishing	1.7 <sup>2</sup>
Freshwater - Shore fishing,	1.7 <sup>2</sup>
Picnicking with family	1.8 <sup>2</sup>
Picnicking with large group	1.8 <sup>2</sup>

## NOTES:

<sup>1</sup>Not estimated because of a lack of data on visitor use patterns, length of season, etc.

<sup>2</sup>Indicates use on one peak weekend

Source: New Jersey Department of Environmental Protection, "New Jersey Outdoor Recreation Demand Study," 1976.

Table B.7 Percentage of Total Annual Use Occuring on One Peak Day/Weekend

0.8 percent for each day and 1.7 percent for each weekend. Similarly, if the occasions were distributed throughout the year, the day and weekend rates would be 0.3 percent and 0.5 percent respectively. Swimming has, by far, the highest amount of peak day usage, with 2.7 percent for saltwater swimming and 2.4 percent for freshwater swimming - reflecting the high participation in these activities on such major summer holidays as Memorial Day, the Fourth of July and Labor Day. A few activities, such as bicycling and trail biking, exhibit very little peak concentration.

Still another measure of activity participation is length of use. The National Recreation Survey (1972) reported this as the average number of hours of participation per activity day. This is presented in the last column of Table B.6. Activities on which more time is spent are hunting (4.4 hours), sailing (4.4 hours), and trail biking (4.0 hours). The most extreme length of use, as might be obvious, is associated with camping. To this end, the Cape May County Campground Survey reported that the typical camper planned to spend from 28 to 33 days at the campground.

#### Reason for Coming to the Pinelands, Preferred Activities

Many people visit the Pinelands to enjoy its numerous and unique recreational resources: the meandering cedar-lined streams, the wooded trails and primitive campgrounds, or the historic sites and towns. Still others come to participate in more popular activities which may be enjoyed elsewhere, but are enhanced by the Pinelands environment. Such activities would include bicycling along the many rural (and flat) roads, picnicking within the pine and oak forests or swimming and fishing at Island Beach State Park.

The popularity of recreational activities which attract visitors to the Pinelands is reflected in Table B.8, Popularity Ranking of Pinelands Recreational Activities. The first column, 'Pinelands Activity Occasions', ranks the twenty-six (26) activities according to the number of activity occasions estimated to occur during 1980 in the Pinelands (Table B.16). The second column, 'Pinelands Counties', ranks these same activities for total estimated occasions in the seven (7) Pinelands counties; the third column, 'Survey Respondents', ranks the activities according to the number of respondents to the 1975 survey (Demand Study) who said they participated in an activity; and, the last column, 'State Activity Occasions', orders the activities according to the estimated New Jersey State total occasions for all fifty-six (56) activities analyzed in the 1977 SCORP. Bicycling, the first-ranked Pinelands activity, is also highly ranked for the counties and State as a whole. The apparent popularity of bicycling and its significance for Pinelands recreation should be qualified, however. In particular, it should be remembered that these estimates are based on the results of the 1975 survey; i.e. during the so-called 'bicycle boom'. It might have been expected that this recreation trend would have resulted in such a high response rate. Moreover, bicycling activity, inventoried and discussed in this report relates to 'bicycle tours' and 'bicycle routes to the shore,' activities in which the casual bicyclist would not likely participate. Consequently, the estimated total occasions of Pinelands bicycling are probably grossly over-stated.

Camping by trailer or camper, the second-ranked activity is, therefore, probably the most predominant Pinelands recreation activity. Interestingly, however, camping ranked quite low according to the survey respondents (23rd), and as a proportion of the total Pinelands counties activities (14th). Similar contrasts with the results of the survey are also reported for hunting (4th vs. 24th) and, to some

<u>Activity</u>	<u>Pinelands Activity Occasions<sup>1</sup></u>	<u>Pinelands Counties Activity Occasions</u>	<u>New Jersey Survey Respondents</u>	<u>State Activity Occasions</u>
Bicycling	1	2	2	1
Camping, trailer	2	14	23	- <sup>2</sup>
Driving for Pleasure	3	3	1	3
Hunting	4	6	24	- <sup>2</sup>
Fishing, saltwater, boat	5	7	9	- <sup>2</sup>
Swimming, freshwater	6	4	5	5
Sunbathing	7	5	6	6
Swimming, saltwater	8	1	3	4
Fishing, saltwater, shore	9	11	14	- <sup>2</sup>
Camping, tent, by car	10	18	17	- <sup>2</sup>
Hiking, nature walk	11	8	11	10
Hiking, trail	12	17	15	- <sup>2</sup>
Birdwatching	13	9	19	13
Boating, sail	14	16	25	- <sup>2</sup>
Boating, saltwater, motor	15	10	12	- <sup>2</sup>
Canoeing	16	21	22	- <sup>2</sup>
Horsebackriding	17	15	13	19
Picnicking with family	18	13	4	14
Historic site visiting	19	12	7	- <sup>2</sup>
Wading	20	19	16	- <sup>2</sup>
Harvesting/Picking	21	23	10	- <sup>2</sup>
Trail biking	22	24	24	- <sup>2</sup>
Boating, freshwater motor	23	25	25	- <sup>2</sup>
Fishing, freshwater boat	24	26	26	- <sup>2</sup>
Picnicking with group	25	20	20	- <sup>2</sup>
Fishing, freshwater shore	26	22	22	- <sup>2</sup>

## NOTES:

<sup>1</sup> From Table 18 in this report<sup>2</sup> State rankings greater than 26

Source: New Jersey Department of Environmental Protection, "New Jersey Outdoor Recreation Demand Study," Volume 1, 1976.

Table B.8 Popularity Rank of Pinelands Recreational Activities

extent, for sailboating (14th vs. 25th), birdwatching (13th vs. 19th) and canoeing (16th vs. 22nd). Tent camping with car access is also ranked considerably higher relative to Pinelands occasions (10th) than for the survey respondents (17th) and the Pineland counties occasions (18th), further reinforcing the significance of camping as a prime recreational pursuit in the Pinelands. Although no data is available for the more primitive camping associated with backpacking, the higher rankings for trail hiking and canoeing, which are regarded as companion activities, indicate that it, too, is a desirable recreation activity in the Pinelands (although in quite limited supply).

Other activities, which appear popular in the State or the seven (7) Pinelands counties, are not so in the Pinelands. The most significant among these is picnicking, as illustrated by the rankings for 'picnicking with family' and 'picnicking with large group'. This is probably a result of the limited supply of developed facilities for this activity in the Pinelands, and that picnicking may be regarded more as an 'at home' activity.

The New Jersey State Park Visitor Use Survey and Visitor Use Study (1966-1967) provide data on the preferred activities of State Park visitors, which is presented in Tables B.9, B.10 and B.11. Swimming and picnicking are very popular activities. Bicycling, however, is much less popular, probably because of the pre- 'bicycle boom'/energy crisis time frame for the survey. As a result these figures may more accurately reflect participation in bicycling in the Pinelands.

Responses summarized in Table B.12 indicate that State park visitors were most likely to return because the facilities were 'clean and well-kept,' 'convenient,' or to participate in a particular activity. Regarding Pinelands facilities, more people said they returned to Island Beach State Park because it was 'clean and well-kept' and more people returned to Wharton State Park because it was 'convenient.' Information from the 1976 Demand Study also indicates that 57 percent of the campers (trailer and car access), 29 percent of the bicyclists, 25 percent of the fishermen and 31 percent of the swimmers felt that there were not enough facilities for their respective activity.

## Pinelands Recreational Activity Occasions

### Methodology

Recreational activity occasion estimates for the Pinelands were adopted from 1980 annual activity occasion projections presented in the New Jersey Outdoor Recreation Demand Study. They were prepared for that report according to a four-step process. First, recreational participation rates for various activities were developed for key socioeconomic variables from the results of the 1975 New Jersey Outdoor Recreation Survey. Those variables were age, family income and available leisure time. The rates were then applied to the total population estimated for each socioeconomic group within each county to develop recreation participation estimates for each county and the State as a whole. Second, these 'in-county' estimates were adjusted to reflect the available supply of a recreation resource within each county. This was accomplished by allocating the total State participation estimates among the various counties in proportion to each county's supply of a recreational resource, as inventoried in the SCORP. Thus, Camden County's saltwater swimmers were allocated to the counties which have ocean beaches. Third, the estimated total New Jersey State recreation activity participation attributed to out-of-state residents were also allocated among the various counties in proportion to each county's supply of

TABLE 6

Purpose for your present visit (percent)

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks				Sub- mean	Total mean
	Hopat- cong	Ring- wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire		
Swimming	87.4	32.6	44.1	52.9	96.2	78.7	86.9	100.0	40.3	52.6	.4	36.7	62.1
Picnicking	27.9	38.2	32.8	32.6	42.2	32.9	37.2	35.5	40.6	44.1	78.2	50.7	41.5
Sightseeing	2.7	14.6	30.6	20.0	9.4	10.3	9.9	6.4	3.3	2.3	57.8	16.2	14.1
Camping		1.1	28.4	15.4	.6		.3	22.6	31.9	37.3	7.6	27.5	13.2
Fishing	9.0	15.7	10.5	11.2	6.7	16.5	12.0	12.9	10.4	4.9	3.1	6.9	9.9
Walking													
Pleasure	3.6	5.6	12.2	8.6	8.5	6.3	7.3	12.9	2.7	.3	5.8	3.0	5.9
Outdoor													
Games	5.4	24.7	3.1	8.2	.2	.7	.4		3.0	1.0	3.1	2.3	2.5
Driving													
Pleasure	2.7	3.4	11.4	7.5	.4	1.5	1.0	6.4	2.2		1.8	1.5	2.2
Other Boating	.9	16.8	.4	4.0		.2	.1	9.7	5.2			2.4	1.6
Nature Walks	1.8	4.5	4.4	3.7	1.9	1.4	1.6		1.1	.3	3.6	1.4	1.9
Hiking	.9	3.4	3.5	2.8		.2	.1		.5	.3	.9	.5	.7
Hunting	1.8		1.3	1.2					.3			.1	.2
Outdoor													
Concerts		1.1	1.3	.9									
Bird Watching	.9	1.1	.4	.7	.2	.7	.4						.2
Water Skiing	.9		.9	.7							.9	.2	.4
Sailing		2.2	.4	.7							.4	.1	.2
Canoeing			1.3	.7				3.2	.3			.2	.2
Ice Skating	2.7			.7				6.4	7.9			3.3	1.4
Bicycling			1.3	.7		.2	.1	3.2			1.3	.4	.3
Outdoor													
Sports Event.	.9	1.1		.5	.2		.1						.1
Surfing					.2	8.4	4.6						.1
Snow Skiing	1.8			.2									2.1
Horseback													T
Riding			.4	.2									
Photography											4.4	1.1	.4
Number Samples	111	89	229	429	519	592	1111	31	367	308	225	931	2471

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Survey," 1966-1967.

TABLE 7

## Purpose for visits to other New Jersey Parks and Forests

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks					Total mean
	Hopat- cong	Ring- wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire	Sub- mean	
Swimming	57.4	37.2	34.6	41.2	64.6	47.5	55.5	64.7	25.8	66.7	31.2	42.1	48.9
Picnicking	48.1	34.9	35.5	38.7	45.4	39.7	42.3	17.6	36.8	28.0	69.4	43.4	42.2
Sightseeing	14.8	18.6	30.8	24.0	27.0	36.6	32.2	52.9	24.5	14.0	59.7	33.1	31.3
Camping	9.2		30.8	18.6	6.8	20.4	14.1	23.5	44.5	28.0	15.3	29.4	19.8
Fishing	25.9	27.9	11.2	18.6	9.2	17.3	13.5	11.8	9.0	9.3	5.6	8.2	12.5
Driving Pleasure	9.2	2.3	12.1	9.3	7.7	7.1	7.4	35.3	8.4	.7	4.9	5.8	2.1
Walking Pleasure	9.2	7.0	8.4	8.3	5.3	4.3	4.8	11.8	1.3	.7	3.5	2.1	4.4
Nature walks	9.2	7.0	7.5	7.8	2.1	3.6	2.9			1.3	7.6	2.8	3.6
Hunting	5.6	4.7	3.7	4.4	4.7	1.8	3.2	5.9		2.0	4.2	2.1	3.0
Hiking	1.9	7.0	2.8	3.4	3.0	2.8	2.9		1.3		.7	.6	2.2
Other boating	1.9		2.8	3.9	1.8	1.3	1.5	5.9	.6	1.3		.9	1.6
Playing outdoor games		4.7	3.7	2.9	2.7	.3	1.4		1.9		2.8	1.5	1.6
Canoeing	1.9			.5	1.2	.8	1.0		3.9	2.0		1.9	1.2
Sailing		2.3	1.9	1.5	2.1	.8	1.4		.6			.2	1.0
Bird watching	1.9	2.3		1.0	1.2	.8	1.0				1.4	.4	.8
Photography	1.9			.5	.3		.1		1.3	.7	.7	.9	.4
Water Skiing		2.3	.9	1.0	1.2		.5						.4
Mount. Climbing			.9	.5	.6	.5	.5						.4
Bicycling			.9	.5	.3	.5	.4						.3
Horseback Riding					.9	.3	.5						.3
Attend. Sports Events						.8	.4	5.9				.2	.3
Attend. Concerts						.8	.4	5.9				.2	.3
Snow Skiing		2.3		.5		.3	.1	5.9				.2	.2
Ice Skating	1.9			.5				5.9				.2	.1
Sledding								5.9				.2	T
Number Samples	64	43	107	204	337	393	730	17	155	150	144	466	1400

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Survey," 1966-1967.

TABLE 8

## Purposes for visits to other State Parks and Forests

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks					Total mean
	Hopat- cong	Ring- wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire	Sub- mean	
Swimming	54.7	53.0	32.7	40.0	47.7	23.6	33.3	23.8	22.4	46.2	13.2	27.6	32.4
Picnicking	30.9	40.0	37.2	36.6	30.3	26.7	28.2		55.6	36.8	59.1	48.7	38.0
Sightseeing	14.3	20.0	28.3	23.4	43.9	60.8	53.6	76.2	15.4	10.9	60.4	27.2	38.5
Camping	16.7	8.0	32.7	23.4	15.7	21.1	18.8	23.8	32.0	51.7	18.2	34.5	26.0
Fishing	11.9	20.0	8.8	12.7	11.5	11.2	11.3	19.1	5.8	6.0	4.4	5.9	9.2
Driving Pleasure	4.8	8.0	13.3	10.2	8.7	6.9	7.6	38.1	12.4	.5	1.9	6.9	7.7
Walking Pleasure	7.1	6.0	4.4	5.4	1.0	2.8	2.1	4.8	.8	1.0	3.1	1.6	2.3
Nature Walks	4.8	4.0	3.5	3.9	3.1	2.3	2.6		.8		3.1	1.1	2.2
Hunting	2.4	6.0	2.7	3.4	5.9	3.1	4.3	9.5			5.0	1.6	3.0
Hiking	2.4	6.0	3.5	3.9	2.1	2.8	2.5		.4	.5	2.5	.9	2.0
Other Boating	2.4	10.0	1.8	3.9	2.1	1.3	1.6	9.5	.8	4.0		1.9	2.0
Playing Out- door Games	7.1	2.0	3.5	3.9	2.1	.5	1.2		1.2	.5	1.3	.9	1.4
Canoeing	4.8	2.0	2.7	2.9	1.0	.5	.7		3.9	.5	1.3	2.0	1.6
Sailing			.9	.5	.3	1.8	1.2						.6
Bird Watching	4.8			1.0	1.4	.5	.9				1.3	.3	.7
Photography					1.4		.6						.3
Water Skiing	2.4		1.8	1.5	.7	.3	.4	9.5			.6	.5	.6
Mountain Climbing	2.4	4.0		1.5		.3	.1				3.1	.8	.6
Bicycling			1.8	1.0	.3		.1		.8			.3	.3
Horseback Riding		2.0	.9	1.0	.3	.5	.4			1.0	3.1	1.1	.8
Attending Sports Events					.3		.1				.6	.2	.1
Attending Concerts					.7		.3						.1
Snow Skiing		2.0	1.8	1.5		1.0	.6			1.0	1.9	.8	.3
Ice Skating											.6	.2	.1
Sledding			.9	.5							.6	.2	.1
Number Samples	42	50	113	205	287	393	680	21	259	201	159	640	1525

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Survey," 1966-1967

TABLE 5

If you have visited this park in the past year (365 days)  
what prompted your return? (check one).

Response	Northern Inland State Parks				Southern Ocean State Parks			Southern Inland State Parks				Sub- mean	Total mean
	Hopat- cong	Ring wood	High Point	Sub- mean	Sandy Hook	Island Beach	Sub- mean	Whar- ton	Par- vin	Cheese- quake	All- aire		
Clean-well kept	40.0	46.5	29.3	36.9	17.3	35.7	27.0	7.1	5.2	6.7	13.5	7.4	21.8
Convenience	30.0	24.2	20.2	24.0	42.3	3.3	21.7	32.1	22.6	32.4	2.1	22.1	22.2
Inexpensive	10.0	3.5	11.2	8.8	10.0	1.9	5.8		.5	1.4		.6	4.4
Many Facilities	6.7	8.6	4.0	6.0	1.6	.5	1.0		1.4	.7	3.1	1.4	1.9
Safety stressed	6.7	1.7	2.0	3.2	1.8	1.1	1.4	3.6	.5	8.1		2.9	2.2
Like-Enjoy	3.3		12.2	6.4	13.7	31.6	23.2	35.7	55.1	17.6	52.2	42.0	27.0
Well-organized				0.0	.9	1.6	1.3			.7		.2	.8
Not crowded		3.5	4.0	2.8	1.2	7.9	4.7	3.6	3.8	13.5	2.1	6.4	5.0
The activity itself	1.7	10.3	2.0	4.1	3.5	11.7	7.9	14.3	5.7	10.8	19.8	10.6	8.2
Other	1.6	1.7	2.0	1.8	4.0	2.2	3.0		3.8	3.4	6.2	3.9	3.2
More than 3 answers			13.1	6.0	3.6	2.5	3.0	3.6	1.4	4.7	1.0	2.5	3.3
Number samples	60	58	99	217	329	367	696	28	212	148	96	1484	1397

Source: New Jersey Department of Conservation and Economic Development, "New Jersey State Park Visitor Use Survey,"  
1966-1967



a recreational resource. Fourth, the activity estimates from the second step (total New Jersey resident participation) and the third step (total out-of-state resident participation) were summed for each county to produce an estimate of total recreational activity likely to occur in each county. In all cases the unit of measurement for recreational activity is the 'activity occasion,' defined as one person participating in one activity at some time during one day. Thus, projected 'activity occasions' were estimated from projected populations for each county and their expected socioeconomic make-up. The 1980 'activity occasion' projection for the seven Pinelands counties are listed in Table B.13. In the Demand Study, high and low population projections had been used to produce high and low activity occasion estimates. Only the high estimates are represented in Table B.14 since the population projections upon which they are based are more in line with those used in the Alan Mallach Associates report, "Population Trends and Demand Pressures in the Pinelands," 1980.

It would have been desirable to utilize the same methodology to prepare recreational 'activity occasions' estimates, unique to the study area; i.e. allocation would have been made according to supply. However, the recreational resource supply data inventoried as part of this study is not comparable to the supply inventory reported in the 1977 SCORP. In fact, this more recent and detailed resource inventory, which is specific to the Pinelands portion of each of the seven South Jersey counties, frequently exceeded the total resource inventory reported for each County in the SCORP. Consequently, another methodology had to be developed to allocate the Pineland county activity occasions estimates to the Pinelands.

This was done by first preparing an 'in-Pinelands' estimate, analogous to the 'in-county' estimate described above. However, since a socioeconomic profile of the Pinelands population did not exist, the 'in-Pinelands' estimate was prepared by assigning the 1980 activity occasions, projected in the Demand Study, to the Pinelands in proportion to the population of each county which resides in the Pinelands. (The 1978 Pinelands population was provided by the Pinelands Commission and adjusted with projected housing unit development data from the Mallach Associates Report to reflect 1980 populations.) These 'in-Pinelands' 1980 recreational activity occasion estimates are presented in Table B.14.

The 'in-Pinelands' estimates were then adjusted to reflect inter-county travel by New Jersey residents, similar to the above-mentioned New Jersey resident activity occasions, and to reflect out-of-state participation. In light of the recreational resource supply inventory limitations, it was decided to prepare these estimates by adjusting the 'in-Pinelands' estimates to reflect recreation participation patterns for various activities according to the Pinelands county(ies) considered to be representative of a particular activity. Thus if the 1980 activity occasion projections for canoeing in Burlington County (the representative county) reveal that the 'in-county' estimate understated 'New Jersey resident' activity occasions by a factor of 4.8, the same factor was used to adjust the canoeing occasions estimate for the Pinelands. However, if the SCORP 'New Jersey resident' estimate for an activity was the same as the 'in-county' estimate, the adjustment factor was assumed to be one (1). The 1980 estimates were similarly adjusted to reflect out-of-state participation. The adjustment factors and representative counties are listed in Table B.15. When out-of-state occasion estimates were not provided in the Demand Study, the percent of out-of-state participation in a given activity was equal to the 'Percent of Total State Participation' (see Table B.1). Total activity occasions for the twenty-six activities were estimated for the Pinelands as a whole. They are listed in Table B.16. (However, estimates for saltwater swimming activity occasions for the Pinelands were derived from attendance data from Island

Table B.13 1980 Activity Occasions Estimates: Totals for Pineland Counties,  
Thousands of Activity Occasions

Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Ocean	Total	Percent	
5,821.1	12,361.4	16,476.1	2,034.9	4,258.9	6,343.2	10,002.6	57,298.2	25.0	Bicycling
606.4	980.9	1,416.4	229.1	398.0	542.2	1,031.4	5,204.4	2.3	Birdwatching
152.1	33.8	50.7	67.6	50.7	84.5	169.0	608.4	0.3	Boating, freshwater, motor
1,364.4	7.6	7.6	1,061.1	227.4	7.6	2,349.7	5,025.4	2.2	Boating, saltwater, motor
574.0	-	-	478.5	95.6	-	1,089.6	2,237.7	1.0	Boating, sail
286.8	135.8	25.7	993.6	2.6	58.9	184.4	1,687.8	0.7	Camping, tent by car
530.1	250.9	47.3	1,836.4	4.7	108.9	340.8	3,119.1	1.4	Camping, trailer/camper
135.1	621.4	54.0	-	162.1	54.0	108.1	1,134.7	0.5	Canoing
2,720.9	5,242.1	7,217.8	990.1	1,931.7	2,803.6	4,661.6	25,567.8	11.2	Driving for pleasure
147.5	32.8	49.2	65.6	49.2	83.0	163.9	590.2	0.3	Fishing, freshwater, boat
263.4	58.5	87.8	117.1	87.8	146.3	292.7	1,053.6	0.5	Fishing, freshwater, shore
603.7	100.6	100.6	2,112.6	1,106.6	100.6	3,420.5	7,545.2	3.3	Fishing, saltwater, boat
394.2	65.6	65.6	1,379.6	722.7	65.6	2,233.7	4,927.0	2.2	Fishing, saltwater, shore
104.4	210.5	286.3	37.4	74.4	109.3	154.0	976.3	0.4	Harvesting/picking
626.3	1,154.0	1,607.6	230.4	437.6	631.6	1,077.5	5,765.0	2.5	Hiking, nature walk
115.9	1,449.7	58.0	115.9	115.9	58.0	290.0	2,203.4	1.0	Hiking, trail
188.3	389.1	527.3	67.3	135.8	202.9	325.5	3,636.2	1.6	Historic site visiting
234.9	478.0	645.7	83.4	171.0	250.4	396.2	2,259.6	1.0	Horsebackriding
437.8	4,378.2	145.9	583.8	73.0	36.5	2,918.8	8,574.0	3.7	Hunting, small game
246.7	246.7	475.6	740.0	123.3	1,233.3	493.3	3,558.9	1.6	Picnicking with family
78.6	78.6	157.2	235.8	39.3	393.0	157.2	1,139.7	0.5	Picnicking with large group
1,067.1	2,267.1	3,043.4	376.6	776.3	1,164.8	1,828.2	10,523.5	4.6	Sunbathing
1,441.6	2,550.5	3,454.2	456.0	911.1	1,323.1	2,006.0	12,142.5	5.3	Swimming, freshwater
11,070.8	-	-	19,373.8	3,459.6	-	26,293.1	60,197.3	26.3	Swimming, saltwater
76.5	153.9	208.1	27.3	55.5	81.1	131.1	733.5	0.3	Trail biking
122.6	260.5	348.9	43.3	89.9	134.4	210.6	1,210.2	1.5	Wading

Source: New Jersey Department of Environmental Protection, "New Jersey Outdoor Recreation Demand Study, Volume 1," Table 2: Summary of Recreation by Participation by County and Activity, 1980, 1976.

Atlantic	Burlington	Camden	Cape May	Cumberland	Gloucester	Ocean	Total	Percent	
2,171.3	3,485.9	889.7	280.8	144.8	976.8	3,711.0	11,660.3	35.4	Bicycling
226.2	276.6	76.5	31.6	13.5	88.5	382.6	1,090.5	3.3	Birdwatching
25.3	37.6	9.9	3.4	1.6	10.8	43.1	131.7	0.4	Boating, freshwater, motor
111.3	106.4	23.7	14.7	4.6	30.9	278.2	569.8	1.7	Boating, saltwater, motor
42.1	31.4	8.2	4.1	1.3	8.7	80.5	176.3	0.5	Boating, sail
14.5	24.1	6.2	1.9	1.0	6.7	24.8	79.2	0.2	Camping, tent, car access
27.7	42.6	11.2	3.6	1.9	12.5	47.6	147.1	0.4	Camping, trailer/camper
10.1	16.4	4.2	1.3	0.7	4.6	16.9	54.2	0.2	Canoeing
1,014.9	1,478.3	389.8	136.6	65.7	431.7	1,729.4	5,246.4	15.9	Driving for pleasure
24.7	28.2	7.3	3.6	1.4	9.4	38.7	113.3	0.3	Fishing, freshwater, boat
48.6	51.3	13.6	7.1	2.7	17.7	69.7	210.7	0.6	Fishing, freshwater, shore
125.4	122.4	32.0	16.7	5.2	35.2	296.3	633.2	1.9	Fishing, saltwater, boat
81.3	80.8	20.9	10.7	3.5	23.5	200.8	421.5	1.3	Fishing, saltwater, shore
38.9	59.4	15.5	5.2	2.5	16.8	57.1	195.4	0.6	Harvesting/picking
233.6	325.4	86.8	31.8	14.9	97.3	399.8	1,189.6	3.6	Hiking, nature walk
38.3	63.1	16.1	5.0	2.6	17.7	24.2	167.0	0.5	Hiking, trail
70.2	109.7	28.5	9.3	4.6	31.2	120.8	374.3	1.1	Historic site visiting
87.6	134.8	34.9	11.5	5.8	38.6	147.0	460.2	1.4	Horsebackriding
123.4	196.0	67.3	16.1	8.4	56.5	199.3	667.0	2.0	Hunting, small game
191.9	297.4	68.1	25.3	12.6	84.9	329.6	1,009.8	3.1	Picnicking with family
59.7	94.1	24.3	7.8	3.9	26.2	101.1	317.1	1.0	Picnicking with large group
398.0	639.3	164.3	52.0	26.4	179.4	678.3	2,137.7	6.5	Sunbathing
528.5	692.6	177.2	55.6	13.7	194.3	730.5	2,392.4	7.3	Swimming, freshwater
577.4	584.9	150.8	75.7	24.5	165.5	1,558.0	3,136.8	9.5	Swimming, saltwater
28.5	43.4	11.2	3.8	1.9	12.5	48.6	149.9	0.5	Trail biking
45.7	73.5	18.8	6.0	3.1	20.7	78.1	245.9	0.7	Wading

Source: New Jersey Department of Environmental Protection, "New Jersey Outdoor Recreation Demand Study, Volume 1," Table 2: Summary of Recreation Participation by County and Activity, 1980, 1976, and Alan Mallach Associates, "Population Trends and Demand Pressures in the Pinelands," 1980.

Table B.14 1980 Activity Occasions Estimates: Pinelands Residents.  
Thousands of Activity Occasions (Numbers reported were calculated from County estimates and the proportion of County residents residing in the Pinelands.)

<u>Activity<sup>1</sup></u>	<u>New Jersey Resident Pinelands Adjustment Factor<sup>2</sup></u>	<u>Percent of Out-of-State Participation</u>	<u>Representative County(ies)</u>
Freshwater shore fishing	0.24	24	Burlington
Hiking, Trail	5.23	19	Burlington
Camping, trailer/camper	25.6	33	Atlantic, Cape May
Camping, tent by car	14.7	30	Burlington, Ocean, Atlantic, Cape May
Sailboating	3.0	40	Ocean
Fishing, saltwater, boat	3.16	26	Ocean
Fishing, saltwater, shore	3.02	27	Ocean
Canoeing	4.82	55	Burlington
Picnicking with family	0.38	9	Atlantic, Ocean, Burlington
Picnicking with large group	0.39	10	Atlantic, Ocean, Burlington
Hunting, small game	4.28	2	Atlantic, Ocean, Burlington

## NOTES:

<sup>1</sup> The factor for activities not listed is assumed to be 1.

<sup>2</sup> The factor is equal to the ratio of the activity occasions attributed to county residents and the supply adjusted estimate given for New Jersey residents.

Table B.15 New Jersey Resident Adjustment Factors Developed From Representative Pinelands Counties

<u>Activity</u>	<u>New Jersey Resident</u> <sup>1</sup>	<u>Out-of-state Resident</u> <sup>1</sup>	<u>Total</u> <sup>1</sup>	<u>Percent</u>
Bicycling	11,660.3	360.6	12,020.9	25.7
Birdwatching	1,090.5	- <sup>2</sup>	1,090.5	2.3
Boating, freshwater, motor	131.7	21.4	153.1	0.3
Boating, saltwater, motor	569.8	77.7	647.1	1.4
Boating, sail	528.9	352.6	881.5	1.9
Camping, tent car	1,164.2	498.9	1,663.1	3.6
Camping, trailer camper	3,765.8	1,854.8	5,620.6	12.0
Canoeing	261.2	319.2	580.4	1.2
Driving for pleasure	5,246.4	53.0	5,299.4	11.3
Fishing, freshwater, boat	113.3	32.0	145.3	0.3
Fishing, freshwater, shore	50.6	16.0	66.6	0.1
Fishing, saltwater, boat	2,000.0	703.0	2,703.9	5.8
Fishing, saltwater, shore	1,272.9	470.8	1,743.7	3.7
Harvesting/Picking	195.4	- <sup>2</sup>	195.4	0.4
Hiking, nature walk	1,189.6	243.7	1,433.3	3.1
Hiking, trail	873.4	204.9	1,078.3	2.3
Historic site visiting	374.3	3.8	378.1	0.8
Horsebackriding	460.2	19.2	479.4	1.0
Hunting, upland, small game	2,854.8	58.3	2,913.1	6.2
Picnicking with family	383.7	37.9	421.6	0.9
Picnicking with large group	123.7	13.7	137.4	0.3
Sunbathing	2,137.7	- <sup>2</sup>	2,137.7	4.6
Swimming, freshwater	2,392.4	180.1	2,572.5	5.5
Swimming, saltwater	1,020.0	980.0	2,000.0	4.3
Trail biking	149.9	6.2	156.1	0.3
Wading	245.9	- <sup>2</sup>	245.9	0.5
<b>TOTAL</b>	<b>40,257.5</b>	<b>6,507.8</b>	<b>46,765.3</b>	

## NOTES:

<sup>1</sup> Activity occasions in thousands<sup>2</sup> Unestimated

Beach State Park and by allocating the Atlantic County estimates to the Pinelands in proportion to the supply of Atlantic County's ocean beaches (measured in miles) that are within the Pinelands.)

#### Activity Occasion Estimates

Overall, approximately 46,800,000 activity occasions are estimated to occur in 1980. Significantly, many of the estimates of Pinelands activity occasions are larger than the Demand Study estimates for the South Jersey counties as a whole (Table B.13). Most notable is camping by trailer or camper, which represents the second most popular activity. Tent camping, car access, also represents a larger share of the total occasion estimates. Other activities which appear significantly more popular in the Pinelands include canoeing, saltwater fishing, trail hiking and hunting. Although activity occasions for trapping could not be developed from the Demand Study data, the New Jersey Division of Fish, Game and Wildlife has estimated that 219,700 activity occasions occurred during the 1978-79 trapping season, representing 0.5 percent of the total estimated activity occasions. Saltwater motor boating, freshwater shore fishing and picnicking are among those activities which appear significantly less popular in the Pinelands than in the South Jersey counties as a whole. Table B.17 reports the estimated peak day or peak weekend occasion estimates for participation in each of the twenty-six (26) activities within the Pinelands, developed from the peak participation data presented in Table B.8. Here the seasonal and holiday influence on participation is reflected in higher proportions of total occasions for all water-related activities, particularly swimming and camping.

**APPENDIX C: THE PROVISION OF RECREATIONAL OPPORTUNITIES IN THE PINELANDS**

An estimate of the total economic value of recreation in the Pinelands must consider the many levels of expenditures generated as a result of recreational activity. Not only are direct expenditures made on specific recreational activities (e.g. renting a canoe or purchasing a fishing license), but also on food, fuel, lodging, transportation and associated equipment and service purchases. In turn, the recipients of these expenditures purchase local goods and services. These additional expenditures are usually discussed as the multiplier effect and are accounted for by incorporating a multiplier into the local economic analysis. It is the intent of this report to discuss the initial level of expenditures generated by recreators in the Pinelands and to examine how these expenditures are distributed among the various recreational providers.

### Expenditures Attributed to Recreation

To develop estimates of expenditures generated from recreational activity it was necessary to determine the extent of recreation activity in the Pinelands and the average or typical expenses incurred while participating in Pinelands recreational activities. Pinelands recreational activity was estimated from activity projections for 1980 published in the 1977 New Jersey State Comprehensive Outdoor Recreation Plan, discussed in Appendix B of this report. Expenditure information was developed from the recently published (1980) two-volume report on Summer Tourism and Travel prepared for the New Jersey Department of Labor and Industry by the Eagleton Institute of Politics at Rutgers University. This study provides expenditure information for one day and overnite participation in summer tourism and travel in New Jersey for six multi-county regions - Skylands, Gateway, Delaware River, North Shore, The Cape and Atlantic City. The Delaware River, The Cape and the North Shore include areas within the Pinelands.

As an example, the expenditure breakdowns reported for the Delaware Region are presented in Table C.1 for day trips and for overnite stays at campgrounds. Since the expenditures are reported as averages per trip, the average size of the party (and length of stay for campgrounds) were used to derive a per person per day figure. The average expenditures per person for day trips equal \$13, with approximately 1/3 for recreation; while the average campground expenditures per person equal \$8, with less than 20 percent for recreation (over 40 percent if campground fees are included as recreation, not lodging, expenses). In developing estimates, expenditures reported for all three regions (North Shore, Delaware River and The Cape) were subjected to a weighted averaging to more accurately reflect probable Pinelands expenditure patterns. As a result, a per person expenditure of \$15 per day was derived for the day visitor and \$9 per day for the campground user. The Cape May County Campground Study (1976) found similar average expenditures for Cape May campers, thus, partially confirming the results.

Since an individual may participate in more than one activity during a given day, certain activities were chosen to be representative of the probable number of activity occasions, or recreation trips made to the Pinelands. These primary activities and the estimated number of 1980 activity occasions derived from the New Jersey SCORP and reported in Appendix B are listed in Table C.2. A total number of activity occasions, day use and overnite trips, was developed from this list and multiplied by the average per person expenditure estimates to yield a total 1980 expenditure estimate of \$296.7 million for the Pinelands. (In addition, the New Jersey Division of Fish, Game and Wildlife estimated the 1978-79 raw fur harvest by trappers in the Pinelands to equal \$902,000.) This process is summarized in Figure C.1. It should be noted that over 20 percent of the total expenditures result from overnite campground use. Since these estimates are based on 1976 projections of recreational activity and per-capita expenditures were averaged



Day Trips:

	<u>Dollars Per Trip</u>	<u>Dollars Per Person Per Day</u>
Food	13 + (3.2 people)	4.06
Transportation	18 + (3.2 people)	5.62
Recreation	<u>11</u> + (3.2 people)	<u>3.44</u>
Total	42 + (3.2 people)	13.12

Overnight:

(Campgrounds)	<u>Dollars Per Trip</u>	<u>Dollars Per Person Per Day</u>
Lodging	55 + (5.3 days + 4.6 people)	2.26
Food	74 + (5.3 days + 4.6 people)	3.03
Transportation	42 + (5.3 days + 4.6 people)	1.72
Recreation	<u>32</u> + (5.3 days + 4.6 people)	<u>1.31</u>
Total	203 + (5.3 days + 4.6 people)	8.32

Source: The Eagleton Poll, Eagleton Institute of Politics, "Volume 1: A Report on One-day Visitors at Tourist Attractions" and "Volume 2: A Report on Travelers Staying Overnight," March 1980.

Table C.1 Delaware Region Expenditures

Primary ActivitiesEstimated Activity Occasions (1980)

Birdwatching	1090.5
Boating, motor, freshwater	153.1
Boating, motor, saltwater	647.1
Boating, sail	881.5
Camping (overnight), tent, by car	1663.1
Camping (overnight), trailer camper	5620.6
Canoeing	580.4
Fishing, freshwater, boat	145.3
Fishing, freshwater, shore	66.6
Fishing, saltwater, boat	2703.9
Fishing, saltwater, shore	1743.7
Hiking, trail	1078.3
Historic site visiting	338.1
Horsebackriding	479.4
Hunting, small game	2913.1
Picnicking with family	421.6
Picnicking with large group	137.4
Swimming, saltwater	2000.0

Note: See Table 18, Appendix B for estimated activity occasions of all Pineland activities.

Table C.2 Estimated 1980 Activity Occasions for Primary Pineland Activities

Total activity occasions associated with day trips:	15,420,000
Average daily expenditures per person, day trips:	X \$ <u>15</u>
Sub-total, day trips:	\$231.3 million
 Total overnite activity occasions (camping):	 7,283,700
Average daily expenditures per camper:	X \$ <u>9</u>
Sub-total, overnite trips:	\$ 65.6 million
 Total 1980 Expenditure Estimates:	 \$296.7 million

Figure C.1 Total Expenditure Estimates

for a variety of activities, they should be regarded as approximations of total expenditures. Moreover, to better understand the magnitude of this estimate from a State-wide perspective, one must be aware that the U.S. Travel Data Center has estimated the total 1976 business receipts for travel and tourism in New Jersey to be almost \$3 billion dollars, as reported in the 1980 Division of Travel and Tourism Master Plan.

Many State facilities in the Pinelands realize income from user and entrance fees, which are technically accounted for within these overall expenditure estimates. The 1979 attendance and income figures for twelve State facilities in the Pinelands are presented in Table C.3. Island Beach State Park, with close to \$500,000, represents more than 1/2 of the total income realized at these facilities. In addition to this income, the State receives license fees for boats, hunting, fishing and shellfishing.

### Recreation Providers

The State of New Jersey is an active provider of recreational opportunities in the Pinelands. In total, it maintains over 240,000 acres of Parks, Forest, Fish and Wildlife Management Areas, recreation areas and historic sites within the Pinelands. In addition, there is the Forked River State Marina (109 boat slips) and over 3,800 acres of State designated natural areas. The State operates campground facilities at Bass River, Belleplain, Lebanon and Wharton State Forests, providing 540 campsites (no hook-ups), 26 cabins and lean-tos and group campsites within Wharton State Forest for up to 1200 tent campers. The campsite fee, regardless of the nature of the facility, is \$5 per night. Fees at the Forked River State Marina range from \$400 to \$695 per season, which runs from April through October.

Federally owned and administered facilities providing recreation opportunities within the Pinelands include the Brigantine and Barnegat Nation Wildlife Refuges, which total over 27,800 acres. There is a short birdwatching and nature tour route provided at Brigantine, but no fee is charged at either facility. County park facilities account for approximately 3,070 acres and there are 32 municipal parks.

The major recreational facilities provided by the private sector are the developed campgrounds, which total 71 and provide over 12,800 campsites. These campgrounds are generally concentrated along the Route 9 corridor and are most numerous in Cape May County. They typically provide hook-ups for water, sewer and electric, and a few provide telephone and cable television service. Most campgrounds also have some facilities for the tent camper. Rates at most sites range from \$6 to \$9 per night without hook-ups and from \$12 to \$14 with hook-ups.

Canoe rentals are provided by 17 private canoe liveries equipped with approximately 1200 canoes. Fees generally are \$10 per day in addition to a \$5 charge for transportation to and from access points along the rivers. Canoe liveries are a long established business in the Pinelands. In fact, one livery has been in operation for over 100 years. Most liveries are located in the vicinity of Wharton State Forest and all are in the northern part of the Pinelands.

Other private sector recreation providers include marinas, an amusement park, golf courses, the Atlantic City Race Track, the Atco Dragway and a nudist camp along the Great Egg Harbor River.

Public Sector

1979

		<u>Attendance</u>	<u>Income (Dollars)</u>
Parks:	Atsion Recreational Area	7,090	
	Barnegat Lighthouse	60,137	42,294
	Double Trouble	12,928	464
	Island Beach	624,224	497,893
Forests:	Bass River	105,438	128,291
	Belleplain	74,500	61,430
	Lebanon	34,496	41,054
	Penn	15,103	
	Wharton	355,359	68,438
Historic Sites:	Barnegat Lighthouse	61,603	1,599
	Batsto	82,750	21,890
	Somers Mansion	790	87
	Total	<u>1,434,418</u>	<u>863,439</u>

Table C.3 1979 Income and Attendance at State Owned Facilities in the Pinelands

Some recreational opportunities are provided or maintained by non-profit private or quasi-public organizations. A unique example of this is the Batona Trail Club, which maintains the 39 mile trail which passes through numerous parcels of public and private land. Another non-profit organization active in the Pinelands is the Whitesbog Environmental Studies Center. The Center maintains 63 acres for hiking, nature walks and environmental study. There are 13 camps operated by either the Boy Scouts or Girl Scouts, church groups or the YMCA. The East Coast Enduro Association maintains over 650 miles of trails throughout the Pinelands and sponsors competitive trailbiking events. Private sportsmen and hunters maintain over 200 club facilities and there are two private wildlife management refuges which total nearly 200 acres.

## **APPENDIX D: PUBLIC PARTICIPATION**

<u>Name</u>	<u>Affiliation</u>
1. Frank Crane	Hospitality Creek Campground
2. Emily Crane	Hospitality Creek Campground
3. William Hickman	Geography Student, Glassboro State College
4. John Davis	Cape May County Campground Owners Association
5. Albert Thornborough	Cape May County Campground Owners Association
6. Peter Peragine	Cape May County Campground Owners Association
7. Marie Brinkerhoff	Cape May County Campground Owners Association
8. Dawn Ruslander	Resident
9. Tom Hennaut	Mullica River Boat Basin
10. George Dilworth	Cape County Campground Owners Association
11. Gary Garrison	Mullica River Boat Basin
12. James A. Horsey	Winding River Campground
13. Bill Bell	Bel Haven Lake Campground
14. Alice McGuinn	Cape May County Environmental Council, Dennis Township Environmental Committee
15. Steve Pickering	Mainland Journal, Reporter
16. John Keeman	Adams Rehmann and Haggan
17. Vince Orlando	Atlantic County Planning Board
18. Cecily Kihn	HCRS
19. Debbie Miller	Pinelands Commission, Intern
20. George Carty	Mohawk Canoe Club
21. Alle Lamphier	East Coast Enduro Riders
22. Robert J. Moore	East Coast Enduro Association
23. Peter Ovenburg	N.J. Chapter Sierra Club
24. Peter Amlicke	Pine Barrens Coalition, N.J. Audubon
25. Betsy Amlicke	Pine Barrens Coalition, N.J. Audubon
26. Paul Schnepf	Pine Barrens Enduro Riders
27. Dolores Schnepf	Pine Barrens Enduro Riders
28. Lynn Robinson	Ocean County Competition Riders
29. Daniel Thompson	Resident
30. William Zycinsky	Gloucester County Parks and Recreation Department
31. Peggy Zycinsky	Gloucester County Parks and Recreation Department
32. Margery Cridland	Medford Environmental Commission
33. Douglass Benson	East Coast Enduro Association
34. Francis Klein	East Coast Enduro Association
35. Beth Cooper	East Coast Enduro Association
36. John Cooper	East Coast Enduro Association
37. Melvin Mulford Dams	East Coast Enduro Association
38. David Crum	East Coast Enduro Association
39. Mrs. Elizabeth D. Cooper	Ocean Nature and Conservation Society
40. Dorothy Hale	Ocean Nature and Conservation Society

Figure D.1 List of Workshop Attendants



<u>Name</u>	<u>Affiliation</u>
41. A.M. Cooper	Ocean County Environmental Agency
42. John Hudson	East Coast Enduro Association
43. Norma Coulston	East Coast Enduro Association
44. David Coulston	East Coast Enduro Association
45. David Swan	East Coast Enduro Association
46. Margaret Flanagan	Batona Hiking Club
47. Bob Agonis	East Coast Enduro Association
48. Ed Mason	Pinelands Canoes
49. Ernest Rogers	East Coast Enduro Association
50. Harry Bonner	Resident
51. Richard Child	Paradise Lake Campground
52. Tony Agonis	East Coast Enduro Association
53. Louis Nagy	Burlington County Conservation Officer
54. Kenneth Martin	Bamber Lake
55. Kerry Jennings	Bamber Lake
56. Robert Abel	Proposed Pine Barrens Campground
57. Barbara Fordyce	ANJEC
58. Felicia Levis	ANJEC
59. Dave Reichert	East Coast Enduro Association
60. Scott May	East Coast Enduro Association
61. Sherm Cooper	East Coast Enduro Association
62. Harold Roland	East Coast Enduro Association
63. Donald Mueller	Freehold Honda
64. Bob Horner	Resident
65. Jenny Walnut	Burlington County Planning Board
66. Phil Costello	Project Use
67. Patrick Barnes	Project Use

Figure D.1 List of Workshop Attendants (cont'd.)

# RECREATIONAL COMPONENT OF THE PINELANDS COMPREHENSIVE MANAGEMENT PLAN

## Recreational Assessment Workshop

Group: \_\_\_\_\_  
(recreational activity name)

Group Participants' Names: (Please print)

See Figure D.1  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Key: A = Agree D = Disagree

1. The important issues and/or problems related to participation in the above activity in the Pinelands are:

a. too many facilities providing the activity

b. not enough facilities providing the activity

c. environmental degradation (litter, erosion, vandalism, air and or water pollution)

d. participation may result in a nuisance to:

- nearby residents

- participants in other recreational activities

- participants in the same activity

e. inadequate safety provisions

f. facilities located far away from potential users

Bicycling, cross-country skiing, horseback riding, hiking	Camping	Canoeing	Sightseeing, picnicking, driving for pleasure	Fishing, boating	Hunting	Nature study, birdwatching, nature photography, botanizing	Off-the-road vehicles (ORV's)	Swimming (fresh-water)
A D	A D	A D	A D	A D	A D	A D	A D	A D
0 18	4 15	6 13	4 15	4 13	5 13	1 18	5 26	2 15
17 1	13 6	10 9	14 5	10 7	11 7	15 4	24 6	10 7
8 10	9 10	8 11	10 9	9 8	6 12	0 19	10 21	2 15
11 7	7 12	3 16	10 9	3 14	12 6	1 18	28 3	3 14
8 10	1 18	2 17	6 13	4 13	13 5	1 18	19 12	4 13
7 11	5 14	7 12	6 13	3 14	5 13	1 18	7 23	4 13
6 12	1 18	2 17	7 12	8 8	5 12	2 17	8 22	6 10
9 9	6 13	5 14	5 14	4 13	3 15	3 16	5 26	4 13

CFA 1980

Figure D.2 Workshop Questionnaire Results

		Bicycling, cross-country skiing, horseback riding, hiking		Camping		Canoeing		Sightseeing, picnicking, driving for pleasure		Fishing, boating		Hunting		Nature study, birdwatching, nature photography, botanizing		Off-the-road vehicles (ORV's)		Swimming (fresh-water)	
		<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>
D.4	g. facilities may negatively impact nearby (incompatible) land uses	11	7	5	14	2	17	4	15	2	15	9	9	0	18	11	20	1	16
	h. cost of participation	5	10	8	11	5	14	3	16	5	12	8	10	1	17	23	8	4	13
	i. the people who generally partake of the activity	7	11	10	9	5	14	3	15	4	12	6	11	2	16	10	21	4	12
	j. lack of maintenance	4	13	6	13	2	17	11	8	3	14	4	13	1	14	6	25	2	15
	k. inadequate access	6	9	2	17	9	10	2	16	3	14	3	14	2	12	4	27	4	12
	l. trespass upon private lands	15	2	9	10	3	16	13	5	8	9	15	2	7	11	13	17	7	9
	m. commercial exploitation of activity	5	13	4	15	6	13	4	15	4	13	2	16	2	17	7	24	4	13
	n. geographic concentration of facilities not distributed throughout the Pinelands	13	5	9	10	6	13	9	10	2	15	4	14	5	14	4	26	4	13
	o. locations of facilities are relatively unknown (not provided adequate signage or markings) not advertised	17	1	7	12	8	11	16	3	10	7	9	9	12	6	9	21	11	5
	p. recreational experience may be negatively impacted by nearby (incompatible) land uses	15	2	8	10	8	10	12	6	7	9	13	4	16	2	18	12	11	5
	q. basically an activity not appealing to Pinelands residents	5	13	6	13	1	18	4	15	0	17	0	17	3	16	7	24	0	17

CFA 1980

Figure D.2 (cont'd.)

D.S

		Bicycling, cross-country skiing, horseback riding, hiking	Camping	Canoeing	Sightseeing, picnicking, driving for pleasure	Fishing, boating	Hunting	Nature study, birdwatching, nature photography, botanizing	Off-the-road vehicles (ORV's)	Swimming (fresh-water)
		<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>
r.	facilities not generally located in environments most conducive to maximum enjoyment of the activity	<u>9</u> <u>7</u>	<u>1</u> <u>18</u>	<u>2</u> <u>17</u>	<u>3</u> <u>15</u>	<u>3</u> <u>14</u>	<u>3</u> <u>15</u>	<u>2</u> <u>16</u>	<u>3</u> <u>26</u>	<u>4</u> <u>13</u>
s.	not enough regulations controlling activity participation	<u>6</u> <u>12</u>	<u>5</u> <u>14</u>	<u>3</u> <u>16</u>	<u>3</u> <u>16</u>	<u>3</u> <u>14</u>	<u>6</u> <u>12</u>	<u>0</u> <u>19</u>	<u>9</u> <u>22</u>	<u>2</u> <u>15</u>
t.	too many regulations controlling activity participation	<u>9</u> <u>9</u>	<u>10</u> <u>9</u>	<u>3</u> <u>15</u>	<u>4</u> <u>15</u>	<u>9</u> <u>8</u>	<u>9</u> <u>9</u>	<u>4</u> <u>15</u>	<u>15</u> <u>16</u>	<u>8</u> <u>9</u>
u.	activity should occur in isolation, i.e. not in combination with other activities	<u>6</u> <u>8</u>	<u>3</u> <u>15</u>	<u>6</u> <u>12</u>	<u>3</u> <u>15</u>	<u>3</u> <u>13</u>	<u>13</u> <u>4</u>	<u>12</u> <u>6</u>	<u>9</u> <u>20</u>	<u>5</u> <u>11</u>
v.	recreational experience is generally poor compared to experience at facilities outside the Pinelands	<u>9</u> <u>9</u>	<u>0</u> <u>18</u>	<u>2</u> <u>17</u>	<u>6</u> <u>13</u>	<u>4</u> <u>13</u>	<u>6</u> <u>12</u>	<u>3</u> <u>16</u>	<u>4</u> <u>26</u>	<u>3</u> <u>14</u>
w.	parking	<u>7</u> <u>11</u>	<u>8</u> <u>11</u>	<u>10</u> <u>9</u>	<u>10</u> <u>9</u>	<u>6</u> <u>11</u>	<u>3</u> <u>15</u>	<u>4</u> <u>15</u>	<u>4</u> <u>27</u>	<u>6</u> <u>11</u>
x.	participation by non-residents adversely alters recreation experience for native Pinelands residents	<u>5</u> <u>13</u>	<u>1</u> <u>18</u>	<u>2</u> <u>17</u>	<u>1</u> <u>18</u>	<u>4</u> <u>13</u>	<u>8</u> <u>10</u>	<u>2</u> <u>17</u>	<u>7</u> <u>23</u>	<u>1</u> <u>16</u>
y.	_____	— —	— —	— —	— —	— —	— —	— —	— —	— —
z.	_____	— —	— —	— —	— —	— —	— —	— —	— —	— —

Figure D.2 (cont'd.)

D.6 2. The following actions should be considered for implementation to resolve the issues and/or problems related to participation in the above activity in the Pinelands:

a. charge fees

b. provide more opportunity for rental of equipment needed to partake in activity

c. limit participation by quotas

d. require permits

e. provide better maintenance

f. regulate time of use (duration or time of day or year)

g. police enforcement/patrol

h. provide physical barriers to prevent/control access to certain areas

i. acquire more land for particular activity

j. seek easements across private lands

Bicycling, cross-country skiing, horseback riding, hiking	Camping	Canoeing	Sightseeing, picnicking, driving for pleasure	Fishing, boating	Hunting	Nature study, birdwatching, nature photography, botanizing	Off-the-road vehicles (ORV's)	Swimming (fresh-water)
<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>
13 5	17 2	10 9	6 12	9 7	11 6	9 9	11 19	8 9
15 3	13 2	8 11	7 10	10 6	6 11	9 8	3 10	5 12
8 10	4 11	5 14	3 14	3 11	9 7	3 14	8 21	3 13
10 8	14 5	9 9	4 13	8 6	12 4	8 9	11 18	5 11
15 3	11 8	7 12	10 8	9 6	6 10	4 10	8 21	9 8
13 5	6 13	5 14	9 9	6 10	14 3	4 14	12 18	10 7
14 3	15 3	11 8	7 11	7 9	11 6	5 13	12 18	9 8
16 2	16 3	10 9	13 5	8 8	12 5	11 7	13 17	13 4
7 11	6 9	9 10	4 14	6 10	3 14	12 6	18 12	8 9
10 8	8 7	12 7	10 8	7 9	7 10	11 7	19 11	9 8

CFA 1980

Figure D.2 (cont'd.)

D.7

	Bicycling, cross-country skiing, horseback riding, hiking	Camping	Canoeing	Sightseeing, picnicking, driving for pleasure	Fishing, boating	Hunting	Nature study, birdwatching, nature photography, botanizing	Off-the-road vehicles (ORV's)	Swimming (fresh-water)
	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>	<u>A</u> <u>D</u>
k. restrict commercial provision of facilities for the activity	<u>5</u> <u>13</u>	<u>4</u> <u>15</u>	<u>6</u> <u>13</u>	<u>3</u> <u>15</u>	<u>5</u> <u>11</u>	<u>7</u> <u>10</u>	<u>1</u> <u>13</u>	<u>5</u> <u>25</u>	<u>4</u> <u>13</u>
l. Improve safety	<u>11</u> <u>7</u>	<u>12</u> <u>7</u>	<u>8</u> <u>10</u>	<u>10</u> <u>8</u>	<u>10</u> <u>5</u>	<u>14</u> <u>3</u>	<u>4</u> <u>14</u>	<u>10</u> <u>19</u>	<u>12</u> <u>5</u>
m. provide better access to facilities	<u>11</u> <u>7</u>	<u>10</u> <u>9</u>	<u>11</u> <u>8</u>	<u>13</u> <u>5</u>	<u>10</u> <u>6</u>	<u>7</u> <u>10</u>	<u>9</u> <u>9</u>	<u>6</u> <u>24</u>	<u>11</u> <u>6</u>
n. design/build better (more attractive) facilities	<u>10</u> <u>8</u>	<u>10</u> <u>5</u>	<u>6</u> <u>13</u>	<u>9</u> <u>9</u>	<u>5</u> <u>11</u>	<u>3</u> <u>14</u>	<u>7</u> <u>11</u>	<u>5</u> <u>25</u>	<u>8</u> <u>9</u>
o. prohibit the activity throughout the Pinelands	<u>0</u> <u>18</u>	<u>0</u> <u>19</u>	<u>0</u> <u>19</u>	<u>0</u> <u>18</u>	<u>0</u> <u>16</u>	<u>0</u> <u>17</u>	<u>0</u> <u>18</u>	<u>6</u> <u>24</u>	<u>1</u> <u>16</u>
p. prohibit the activity in certain areas of the Pinelands	<u>13</u> <u>5</u>	<u>12</u> <u>7</u>	<u>5</u> <u>13</u>	<u>7</u> <u>10</u>	<u>6</u> <u>9</u>	<u>10</u> <u>6</u>	<u>3</u> <u>14</u>	<u>11</u> <u>18</u>	<u>5</u> <u>11</u>
q. limit participation in the activity to organized groups	<u>1</u> <u>17</u>	<u>1</u> <u>18</u>	<u>2</u> <u>17</u>	<u>3</u> <u>15</u>	<u>1</u> <u>15</u>	<u>2</u> <u>15</u>	<u>1</u> <u>17</u>	<u>3</u> <u>26</u>	<u>1</u> <u>16</u>
r. reduce existing regulations governing participation in the activity	<u>7</u> <u>7</u>	<u>10</u> <u>9</u>	<u>6</u> <u>13</u>	<u>7</u> <u>11</u>	<u>5</u> <u>11</u>	<u>5</u> <u>12</u>	<u>7</u> <u>7</u>	<u>19</u> <u>11</u>	<u>8</u> <u>9</u>
s. require registration prior to participation and provide educational material	<u>10</u> <u>8</u>	<u>14</u> <u>5</u>	<u>11</u> <u>8</u>	<u>3</u> <u>15</u>	<u>5</u> <u>11</u>	<u>12</u> <u>5</u>	<u>3</u> <u>15</u>	<u>8</u> <u>22</u>	<u>4</u> <u>13</u>
t. advertise recreational opportunities available in the Pinelands	<u>15</u> <u>3</u>	<u>19</u> <u>0</u>	<u>15</u> <u>4</u>	<u>17</u> <u>1</u>	<u>13</u> <u>3</u>	<u>12</u> <u>5</u>	<u>14</u> <u>4</u>	<u>9</u> <u>21</u>	<u>16</u> <u>1</u>
u. require developers to provide facilities for the activity	<u>8</u> <u>10</u>	<u>10</u> <u>9</u>	<u>6</u> <u>13</u>	<u>7</u> <u>11</u>	<u>8</u> <u>8</u>	<u>5</u> <u>12</u>	<u>6</u> <u>12</u>	<u>12</u> <u>18</u>	<u>9</u> <u>8</u>

CFA 1980

Figure D.2 (cont'd.)

		Bicycling, cross-country skiing, horseback riding, hiking		Camping		Canoeing		Sightseeing, picnicking, driving for pleasure		Fishing, boating		Hunting		Nature study, birdwatching, nature photography, botanizing		Off-the-road vehicles (ORV's)		Swimming (fresh-water)	
		<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>	<u>A</u>	<u>D</u>
D.8	v. eliminate/reduce use of facilities for more than one activity	13	5	2	16	3	15	3	13	3	11	6	8	5	9	6	20	2	11
	w. provide more:																		
	- Federal facilities	6	12	2	17	3	16	6	11	3	12	3	13	5	12	3	26	8	8
	- State facilities	7	11	4	15	7	12	6	11	4	11	3	13	5	12	17	12	8	8
	- Municipal facilities	5	13	2	17	5	14	7	10	4	11	3	13	5	12	1	28	8	8
	- County facilities	4	14	2	17	6	13	8	9	4	11	3	13	5	12	2	27	8	8
	x. leave things as they are and let the issues/problems resolve themselves	6	12	5	14	6	13	4	13	5	10	8	8	5	12	19	10	3	13
	y. encourage commercial provision of facilities for the activity	10	8	12	7	13	6	9	8	10	5	8	8	8	9	9	20	11	5
	z. _____	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	_____	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Figure D.2 (cont'd.)

3. Identify a good example(s) of a facility(ies) in the Pinelands which provides for the above activity.
  - a. Bicycling, cross-country skiing, horsebackriding, hiking
    - Batona Trail
  - b. Camping
    - Paradise Lakes
    - Belleplain State Forest
    - Bass River State Forest
    - Indian Branch Park
    - Wading River Campgrounds
  - c. Canoeing
    - all Wharton area rivers
  - d. Sightseeing - Batsto
    - Oswego Lake
 Picnicking - Lebanon - Deep Hollow
    - Harrisville Lake
    - Oswego Lake
 Driving for
 Pleasure - Route 563
    - Lacey Track - Forked River
    - Oswego Lake
  - e. Fishing, boating
    - Oswego Lake
    - Atsion Lake
  - f. Hunting
    - Some reserves
    - Hunting clubs
  - g. Nature study, birdwatching, nature photography, botanizing
    - Batsto
  - h. Off-the-road vehicles (ORVs)
    - State forests
    - Private lands
    - Public lands
  - i. Swimming (fresh-water)
    - Oswego Lake

Figure D.2. Workshop Questionnaire Results (cont'd.)



4. Identify a bad example(s) of a facility(ies) in the Pinelands which provides for the above activity.
  - a. Bicycling, cross-country skiing, horsebackriding, hiking
    - Dirt roads for hiking on Pakim Pond
  - b. Camping
    - Atsion State Forest
    - Lebanon State Forest
    - Bel Haven Lake
  - c. Canoeing
    - Cedar Creek
    - Rancocas Creek
  - d. Sightseeing -  
Picnicking -  
Driving for  
Pleasure - Fire Tower Road
  - e. Fishing, boating
    - Pakim Pond
    - Chatsworth Lake
  - f. Hunting
    - Clearing of natural habitats
    - Developments
  - g. Nature study, birdwatching, nature photography, botanizing
    - Webbs Mills
  - h. Off-the-road vehicles (ORVs)
    - Encroachment of housing and commercial development
  - i. Swimming (fresh-water)
    - Hidden Lake Clay Pit

Figure D.2 Workshop Questionnaire Results (cont'd.)

5. Give an example(s) of a place(s) in the Pinelands where a facility providing for the above activity might be located in the future.
  - a. Bicycling, cross-country skiing, horsebackriding, hiking
    - Further development of existing trails, rather than new facilities
  - b. Camping
    - Route 539 Manchester Township
  - c. Canoeing
    - More access to Oyster Creek
  - d. Sightseeing - Wells Mills  
 Picnicking - Forked River  
               - Wells Mills  
 Driving for  
 Pleasure -
  - e. Fishing, boating
    - Friendship Bogs
  - f. Hunting
    - Open Space
    - Public land
  - g. Nature study, birdwatching, nature photography, botanizing
    - Double Trouble
    - Lebanon State Forest
  - h. Off-the-road vehicles (ORVs)
    - Does not apply, provided no future restrictions are imposed
  - i. Swimming (fresh-water)
    - Harris Lake

Figure D.2 Workshop Questionnaire Results (cont'd.)

<u>Name</u>	<u>Affiliation</u>
1. Bert Nixdorf	South Jersey Outdoors Club
2. Louis Nierle	New Jersey Private Campground Association, Executive Director
3. Carl Curtin	Methodist Conference Center
4. George Carty	Mohawk Canoe Club, President
5. Mae Barringer	Pine Barrens Coalition
6. Dr. Eugene Vivian	Whitebog Environmental Studies Center, Executive Director
7. Dan O'Connor	Cumberland County Conservation League, President
8. William Haines	Cranberry farmer
9. Jack Cervetto	Gatherer
10. Jacki Stanley	New Jersey Department of Community Affairs
11. Margaret Flanagan	Batona Hiking Club of Philadelphia, South Jersey Canoe Club
12. Carol O'Neill	New Jersey Trails Council Green Acres
13. Shirley Bailey	South Jersey Magazine, Editor
14. Christian Bethman	Lebanon State Forest, Superintendent
15. Ethel Brower	Equestrian
16. Jack Davis	Foxhunter
17. Brooks Evert	Informed resident
18. Mary Ann Thompson	Informed resident
19. Gaylard Inman	Brigantine Wildlife Refuge, Manager
20. Beth Cooper	Ocean County Competitive Riders, Enduro Club
21. Mrs. John Cadbury	Birders
22. Bruce Allen	New Jersey Beach Buggy Association, Secretary
23. Barry Leilich	Photographer
24. John Volk	New Jersey State Federation of Sportsmen's Clubs Southern Region
25. Jim Furlong	South Jersey Furtakers Association
26. Ernie DeStephano	Trapper
27. Marion Duchesne	Burlington County Girl Scout Council
28. John Davis	Cape May County Campground Owners Association
29. William Bell	Bel Haven Campground, Owner
30. Deborah Dingie	Cedar Creek Campground, Owner
31. Tom Hennaut	Mullica River Marina, Owner
32. Andrew Grasso	Ocean County Parks, Director
33. George Wells	Chief of Police, Woodland Township
34. Louise Simmons	Simmons Bait and Tackle Shop
35. Thomas J. Progranicy	Belleplain State Forest, Superintendent
36. John B. Verdier	Island Beach State Park, Superintendent
37. John Garcia	Bureau of Parks and Forestry
38. Jim Hurley	South Jersey Tourism Council
39. Madelyn Mueller	Nacote Creek Research Lab
40. Harry Leeds	Councilman, Planning Board, Galloway Township

Figure D.3 List of Interviewees

<u>Name</u>	<u>Affiliation</u>
41. Joe Truncer	Bureau of Parks and Forestry, Retired Director
42. Larry Ireland	South Jersey Resource, Conservation and Development Council
43. Dennis Fox	Bass River State Forest, Superintendent
44. Elizabeth Woodford	Cedar Run Wildlife Refuge, Owner
45. Syd Walker	Division of Parks and Forestry, Region 1, Director
46. John Rauschner	New Jersey State Federation of Sportsmen's Clubs
47. Lois Johnson	State Trails Coordinator
48. Cecilia Penna	Kettle Run Camp, Recreation Director
49. Carol Nash	Bel Haven Campground, Activities Director
50. Virginia Carty	Mohawk Canoe Club, member
51. Ernie DeStephano, Jr.	Trapper
52. Charlie Cooper	Hunter
53. Mrs. Brooks Evert	Pine Barrens Conservationists
54. John Cadbury	Birder
55. John Leonard	Canoe Livery Operator, Cedar Creek Campground
56. Bob Kalinowski	Forked River State Marina, Superintendent
57. Ray Porutski	Bureau of Freshwater Fisheries, Regional Manager
58. Robert Moore	East Coast Enduro Association, President
59. Harry J. Divins	DICO Enterprises, Inc., T/A Blue Dolphin Campground

Figure D.3 List of Interviewees (cont'd.)

**APPENDIX E: IDENTIFICATION OF ISSUES ASSOCIATED WITH  
RECREATIONAL USE OF THE PINELANDS**

This Appendix provides a discussion of the issues associated with participation in various activities in the Pinelands which were uncovered principally as part of the public participation problem. These issues focus upon the problems or conflicts which result from participation in ten principal activities including:

- camping
- bicycling
- horsebackriding
- hiking
- canoeing
- hunting/trapping
- boating
- off-the-road vehicles (ORVs)
- swimming
- nature study/historic site visitation

No major problems or conflicts have been identified peculiar to participation in the following activities:

- fishing
- picnicking
- photography
- motorcycling
- cross-country skiing
- driving for pleasure
- sightseeing

This is generally because such activities are not prone to conflict (e.g. photography); are treated by the discussion of other uses (e.g. motorcycling and ORVs); are associated with problems and/or conflicts not inherent to participation in the activity, or which may be illegal acts (e.g. picnicking and littering); or, were not identified with major problems or conflicts as a result of the public participation process.

The relevant issues, conflicts, and problems related to Pinelands recreation are presented below in ten (10) sections corresponding to the recreational activities identified above. Whenever possible, they are discussed according to the following characterizations:

1. magnitude of the problem or conflict
2. geographic locations where the problem or conflict is manifested
3. length of time problems have existed and when they are most severe
4. compatibility with existing land uses or other recreation activities
5. ways in which the problem or conflict may be mitigated or overcome

Hiking - The visual encroachment of development in the vicinity of certain trails has recently become a significant problem. This has been identified as an issue of particular relevance along the Batona Trail. It is presently being addressed by the New Jersey Trails Council through the creation of a buffer zone in critical areas to prevent continued disturbance to nearby residents and degradation of the hiking experience for users of the Trail. However, rerouting of the Trail is more likely to enhance the experience of the hikers. Other issues associated with the expansion of hiking activity in the Pinelands include:

- extensions of the Batona Trail into the Rancocas and Cedar Creek watersheds, and expansion of the Trail into a loop circuit
- the creation of more varied hiking trails and localized scenic trails
- providing multiple use facilities at trailheads
- providing short loop trails off the main trail
- clearly marking trails, particularly specific purpose trails and the provision of trail maps
- allowing and providing for trail use in State Wildlife Management Areas
- the segregation of trail use according to 'traffic' volumes and purpose of use criteria

Facilities which provide for overnite camping along trails are considered to be inadequate at present. More facilities are needed, and facilities which are intended for use only by hikers are preferred. A proposed location for such facilities is in the Batsto area. Signage and awareness are considered a problem for an existing facility of this type in Lebanon State Forest. Proposals as far-reaching as the provision of a 'youth hostel' have even been suggested.

Hiking is generally compatible with other recreation activities, and such activities as photography, nature study and general sightseeing may be regarded as companion activities. ORV use in proximity to, or on, hiking trails, however, is considered to be a direct conflict due to a reduced quality of experience, particularly as it may result in damage to the trail surface. Consequently, multiple use of trails for such uses are not desirable. Horsebackriding, on the other hand, is considered to be compatible given low volumes of horse traffic.

Bicycling - Bicycling, in general, does not conflict with other land uses or other recreational activity in the Pinelands. However, specific facilities which accommodate bicycling activity are an obvious need. Paved bike paths should be provided within the rights-of-way of existing roads along bicycle routes, separated from motor vehicle traffic lanes. At a minimum, the shoulders of all roads which are identified as bicycle routes should be paved. Subsequent to the provision of such facilities, trail route markers should be erected. At present, few markers and/or route facilities exist, forcing cyclists to conflict with vehicular traffic, an obvious safety hazard for both bicyclists and Pinelands travelers driving for pleasure or sightseeing.

Horsebackriding - The greatest single problem associated with this activity is the inadequate number of facilities which exist. Future development might include parking areas for trailers, overnite camping facilities which accommodate riders and animals through the provision of overnite sleeping areas and simple pole barns with water provided nearby. Although conflict with other recreational activity is low, multiple use of horsetrails should be minimized, particularly as horse traffic volumes may increase as a result of the provision of better facilities. Moreover, horsebackriding should be limited on roads open for use by motorized vehicles to conditions of absolute necessity (crossovers and transit between trail crossings),

Camping - The greatest single conflict associated with this activity is the issue of competition (real or perceived) between private campgrounds and State facilities.

Although private campground owners do not feel business is being hurt drastically, they are aggrieved by a situation which uses their tax dollars to provide facilities potentially harmful to their business. 'Hardliners' feel the State should have to operate on a 'for profit' basis and/or charge the same fees as the private facilities. More reasonable aggrieved parties feel that the State should just lessen the difference between the State and private rate structures in order to continue to offer camping facilities to campers of lesser means who can't afford the higher prices. In addition, the lack of compliance of State campground facilities with Chapter XI of the New Jersey State Sanitary Code, regulating Campgrounds, is also often identified as a perceived injustice.

In conjunction with the issue of competition, campground owners have voiced their opposition to the five percent excise tax proposed in the Draft Comprehensive Management Plan. Questions asked are why just campgrounds, and not other recreation providers; what about the competitive edge this will give campground owners located adjacent to, but not within, the Pinelands; and, what is the State proposing to provide to them for this fee.

Campers, themselves, are concerned about the distribution of campsites in the Pinelands and the lack of facilities for the attainment of a primitive camping experience, particularly as it may relate to sites intended for use by small groups and individuals. It is felt that the provision of such facilities is the responsibility of the State, not the private sector.

Some private campgrounds have observed a degradation of the environment adjacent to their facilities as a result of encroaching development. This is a particular problem where there is an intervening or common water body.

It is recommended that the Commission investigate the potential problems which may be associated with "condominium camping," a growing camping phenomenon in the Pinelands.

Canoeing - Overcrowding is the major problem associated with canoeing in the Pinelands and results in secondary impacts which further degrade the recreational experience (litter, habitat disruption, and bank erosion). Overcrowding is a critical problem on weekends during the summer. Canoe livery operators and canoers are concerned about any potential plans to limit canoe traffic, and suggest "opening up" additional sections of the streams/rivers to mitigate the problem. Suggested segments include: the upper portion of the Oswego, the upper Mullica from Jackson Road to Atsion, and the Batsto River between Batsto Village and Crowley's Landing. Congestion has also become critical at various river access points, particularly at County Road in Speedwell. Mitigation of the overall crowding problem has prompted the suggested need for starters at put-in points and a program for surveillance and patrol.

Improvements to the canoeing facilities which have been suggested include the provision of designated rest areas along the rivers, debris removal on a regular basis and the provision of parking and car-top launch facilities at the various river access points. Lack of the latter is thought to discriminate against the individual recreators who have their own canoes. Parking is a particular problem at Speedwell, Oswego Lake and Harrisville Lake. Use of the rivers by inexperienced canoeists also aggravates the crowding problem and may result in safety hazards to all canoeists. It has been suggested that canoe livery operators provide some level of instruction, restrict use by extreme novices or put them on less demanding waters, and/or require them to sign papers attesting to their ability to swim. Lastly, it should be



reported that canoe livery operators are very concerned about rumors which are circulating which have identified a State plan to take over the canoe livery business in the Pinelands whether through unfair tax revenue, subsidized competition or outright condemnation.

Hunting/Trapping - The disruption or fragmentation of existing habitats has been identified as a significant problem. Moreover, management of remaining land to improve habitats is not conducted in a systematic or extensive manner. In fact, past management practices, conducted by the Division of Fish, Game and Wildlife, have been reduced or eliminated. In general, the popularity of these activities would seem to warrant a greater allocation of funds to the Division of Fish, Game and Wildlife for proper wildlife management in the Pinelands. Hunting lands are not particularly well-identified and trespass on private land is a frequently mentioned problem. Hunters, themselves, have suggested the need for a better system for posting lands, and use of it. They also feel more game wardens are needed to improve management and control unrestricted participation in the sport.

Hunting may pose a significant conflict with many other land uses and recreational activities as a function of the inherent safety hazard. However, the hunting seasons are generally short and do not occur at the same time as the bulk of other recreational activities. As a result, compatibility is relatively high.

Another important issue is concerned with road access to some of the more remote areas of the Pinelands. It is hoped that roads will not be closed, at least during the hunting and trapping seasons.

A problem which is not particularly acute, but significant nonetheless, is concerned with the provision of areas of the Pinelands for use by the general public; i.e. hunters who do not belong to organized clubs. Areas should be set aside within the Pinelands for non-proprietary hunting activity.

ORVs - Problems related to the use of such vehicles are generally associated with irresponsible use to attain the thrill of relatively high speed passage through the Pinelands. They are not generally associated with their use for access to fishing and hunting areas. Improper use of ORVs may result in ecological damage, safety hazards and or conflicts with other recreational activities. Heavy use and damage has been reported on Hampton Furnace Road and various sand roads in Wharton State Forest. The provision of designated areas for such 'thrill-oriented' use, such as abandoned sand or gravel extraction areas, and the imposition of heavy fines for use in non-designated areas has been suggested.

Enduros, or organized time and distance trailbiking events, are another controversial issue concerned with the use of ORVs. Although some residents have a marked disdain for any motorcycling activity in the Pinelands, there is a relatively widespread acceptance of enduros by residents and custodians of affected State Lands. These events provide revenue to local volunteer fire companies and or sportsmen's clubs. The Enduro Clubs engage in litter clean-up and vigorously maintain their trails, allowing for their on-going multiple use. Permission to hold events is always obtained from private landowners, Park and or Forest Superintendents.

Enduro use, however, must not be considered absolutely benign. Some existing trails are located in areas in which such use is grossly incompatible with the existing environment. The most obvious example of such incompatibility is trail use in the East and West Plains. Moreover, enduro groups are also involved in trailblazing activities on undisturbed land. This activity should be discouraged, or at least monitored, more closely than it appears to be at present. Enduro use is also considered offensive by people engaged in other forms of recreation activity. However, enduros are generally

short-term events, which, as they relate to State lands, are prohibited during the period May 15 through September 15 each year, thus minimizing much conflict with other recreationists. Particular conflicts are identified with hiking, nature study and horsebackriding.

The most significant problems concerned with trailbiking are the result of indiscriminate use by 'thrill seekers,' who engage in irresponsible activity. Particular problems have been identified off Lacey Road in Lacey Township; and, in other areas where powerline rights-of-way provide for uninterrupted runs. In general, it is felt that use areas for such facilities should be provided and that destructive and irresponsible users should be punished under the law for activity outside of them.

Boating - Waterway maintenance is the most critical issue associated with this activity. Debris has been cited as a cause of safety hazards. Untimely channel marking has caused activity disruption and decreased marina business. It is generally felt that boating facilities are inadequate at present. More private marinas are needed due to increased demand for participation in boating. (The Forked River State Marina is now at capacity, and a long waiting list regulates future access to it.) Similarly the need for more boat ramps has been identified.

Motor boating may result in surface water pollution and streambank erosion and the Mullica River was mentioned as a river already showing signs of environmental degradation.

Swimming - The primary problem associated with this activity is a lack of facilities. Existing facilities are overcrowded and often reach capacity on weekdays. Pakim Pond, in Lebanon State Forest, has been cited as a facility which often reaches its one hundred person capacity in an attempt to accommodate day-users and overnite campers. The future development of Reeves Bog, as a full-facility swimming area, may alleviate this problem.

Requests for additional facilities at Oswego Lake and Island Beach State Park were voiced. Apparently Oswego Lake once provided for swimming activity, but funding for maintenance caused its closure. Fears were expressed relative to the passage of legislation to prevent further development of Island Beach State Park.

Nature Study/Historic Site Visitation - Several people interviewed defined a need for more nature trails and the need for the improvement of existing ones, such as the one located at Batsto. Nature trails could be developed along existing hiking trails through the provision of signage and other self-guiding facilities. Areas of particular natural interest which have been proposed for potential facility location include Buck Run and Forge and Goshen Ponds. In conjunction with the provision of facilities the conduct of a statewide educational program is considered vital to the appreciation of the uniqueness of the Pinelands.

Nature study and historic site visitation are compatible with a number of other recreation activities (e.g. hiking, canoeing, camping, driving for pleasure, sightseeing and bicycling) and may even take place in conjunction with them during a given visitation to the Pinelands. However, they are in conflict with almost all high intensity recreational uses. The most obvious conflicts result from proximity to hunting and the use of ORVs which would preclude the observation of wildlife and/or provide for a disjointed context.

Many suggestions were made for the improvement of existing historic sites to provide more opportunities for visitation. The following is a presentation of some ideas:

- restoration of Double Trouble as a cranberry village
- restoration of Whitesbog as a blueberry village
- placement of historic site markers in old towns (e.g. on buildings such as Busby's General Store)
- special attention should be paid to the archaeological value of ghost towns such as Paisley; Pinehurst, behind Apple Pie Hill; Calico, near Martha's Furnace; Ong's Hat; South Hampton, Florence; Rhone; Paradise; and Pasedena
- creation of an historic auto tour from Batsto and Quaker Bridge to Atsion (It was suggested that a carriage route might be appropriate considering its former use by schooner wagons.)
- reconstruction of an old tavern at Washington Field
- reconstruction of a glass works and museum

Many felt that historic sites are inadequately presented considering the potential for site development in the Pinelands. Historical site visitation, like nature study, is generally compatible with most low intensity recreational activities and may be enjoyed in conjunction with them. Similarly, however, it may be adversely affected by high intensity activity.

## **APPENDIX F: IMPACT ASSESSMENT**

The following is a discussion of the primary and secondary impacts that may occur assuming growing demand for recreational use of the Pinelands. Presentation is made by activity and may address social, economic and or environment concerns.

Hunting/Trapping - Increased demand for hunting/trapping will likely result in increased revenue to the State for licenses and related permits and increased demand for management of the wildlife resources of the Pinelands. Support facilities such as commercial establishments involved in the sale of food, fuel, and equipment are likely to be beneficially affected. Moreover, the potential construction of hunt and sportsmen's clubs may add to tax revenues, although these revenues will be relatively small and few in number. A greater number of hunters/trappers using the same quantity of land may increase the hazard potential associated with these activities, reduce the natural environmental context for participation and may even result in a reduction of wildlife numbers. Moreover, a large increase in hunters traversing the Pinelands will increase the potential for inadvertent, or deliberate, damage to existing rare, threatened and or endangered flora and fauna.

Fishing Boating - As demand for fishing may increase there will be a greater demand for marinas and boat launch facilities. The State may need to consider the provision of same, fish stocking programs and means to develop a greater number of shellfishing lease lots. Moreover, pressure will surface to expedite clean-up of bay waters. Crowding of the rivers and bays may occur depending upon the amount of demand and will likely result in conflicts with waterskiers and other boating enthusiasts. Increased revenues associated with the fishing and boating industry would also result.

Horesbackriding - A growing demand for this activity will likely result in a more pressing need for facilities related to it. Increased horse volumes on existing trails and roads will begin to heighten presently latent conflicts with other recreationists and result in pressure for the designation of single purpose trails. Increased expenditures will be minor.

Canoeing - Increased demand for canoeing will aggravate an already critical overcrowding problem forcing the use of more sections of canoe rivers, and may threaten the provisions of this plan. Ultimately, canoeists not interested in an 'amusement park' atmosphere will be forced out of the Pinelands. Increased demand for canoe rentals may result in a need for more liveries or expansion of existing ones, thus increasing revenue for this sector of the recreational economy. Overcrowding of the waters, access points and parking areas will reach crisis proportions and begin to test the environmental resiliency of areas adjacent to the water and those in close proximity to 'put-in' and 'take-out' areas. Most significantly, what increased demand for this activity will likely do is force the canoe livery industry and the State to employ some rather drastic management techniques to control the industry and protect the environment of the Pinelands.

Camping - Increased demand for camping will put pressure on private industry and the State to provide more facilities. This will undoubtedly produce increased revenues, in the long run. However, the interim period may result in numerous refusals due to the capacitization of existing facilities. Incidents of unlawful camping may result, and this increase in woods inhabitants will threaten control of the ever-present forest fire hazard. Increased camping will also result in increased participation in other recreational activities, normally enjoyed as part of a camping event (e.g. hiking, canoeing, nature study).

Picnicking - An increased demand for picnicking will likely result in overcrowding at existing facilities and increased pressure to provide more. The likelihood of

an escalation of the litter problem is great. Most significantly, the inability to picnic in designated areas is likely to result in the use of undesignated areas and increased forest fire hazard potential.

Nature Study - Already requests are made for the development of more facilities and the improvement and expansion of existing ones. Overuse of facilities and the advertisement of areas conducive to such activity may result in the environmental degradation of some of the most ecologically sensitive areas of the Pinelands. Most importantly, however, one must consider the effects on this activity which are likely from an increased demand for other recreational activities and facilities. The natural environmental context for participation will undoubtedly be threatened.

Photography - No significant impacts are anticipated relative to increased demand for participation in this activity in the Pinelands. However, it may be increasingly difficult to engage in nature photography if the Pinelands are overdeveloped.

Bicycling - Increased demand for bicycling will result in pressure for the provision of appropriate bicycling facilities. In the event they are not provided, safety hazard potential will be increased for both motor vehicle operators and the bicyclists themselves.

Motorcycling/ORVs - Increased demand for participation in these activities will make provision of specific use areas even more imperative. Without such facilities and without laws regulating use, indiscriminate use will escalate with its inherent problems of ecological damage, trespass and nuisance to other recreators and Pinelands residents.

Hiking - Increased demand for hiking activity in the Pinelands will test the carrying capacity of the present trail network and require the creation of new trails or expansion of existing ones. Again, in the short run, the backpackers and devotees of 'backwoods' hiking will be driven from the Pinelands. The need to provide a variety of hiking experiences will, over time, require the use of some rather far-reaching management techniques to control use.

Cross-country skiing - It is not anticipated that increased demand for this activity will occur; and, even if it did, it is not expected to reach a level which would result in significant impacts.

Driving for Pleasure/Sightseeing - Aside from an increase in vehicular and pedestrian traffic throughout the Pinelands, an increased demand for participation in these activities will require an increase in the commercial provision of food, souvenirs and fuel, and an increase in revenues to commercial enterprise as a result.

Swimming - An increased demand for swimming facilities already exists (e.g. more take facilities such as Atsion and more beach area at Island Beach State Park), according to many people. Without such facilities, demand will be unsatiated, or overcrowding will result. Most importantly, however, lodging and camping facilities, food and general commercial establishments would not be permitted to enjoy the increased revenue which would otherwise result.

## **APPENDIX G: ENVIRONMENTAL ANALYSIS**

Strongly Positive Elements:

## Topography

- elevations above 150 feet

## Visual Resources

- areas nominated as "scenic areas" 13 or more times (HCRS Pinelands Scenic Study)

## Recreational Land Use

- most picturesque part of the Batona Trail
- natural area - State designated
- natural area - State non-designated
- national natural landmark
- memorial
- point of interest - natural
- scenic vista
- potential National Wild and Scenic River
- National Wild and Scenic River Study Candidate
- State Wild and Scenic River Study Candidate
- sightseeing route/automobile tour (scenic, nature, fall foliage, historic)
- historic site - potentially eligible for National Register, State Register or HABS; or, in need of more investigation
- historic site - National Register, State Register, or HABS
- historic area
- proposed historic district
- historic district/National Register
- golf course
- lookout tower/fire tower
- gardens
- state parks

## Vacation

- cedar swamp
- coastal marsh
- bog/inland marsh (excluding cranberry bog)
- streams and rivers
- lakes and ponds
- bay and ocean
- agricultural land
- pitch pine lowland
- hardwood swamp

## Land Use

- cranberry bog

Strongly Negative Elements:

## Land Use

- commercial industrial
- other urban land
- sand gravel and other mining (resource extraction areas)
- other barren land

## Solid waste disposal sites

- refuse only
- refuse and liquid sludge
- refuse, liquid and dry sludge

Figure G.1 Visual Landscape Quality Criteria





**Health, Safety Hazard**

cfo: Aug. 1938

## **APPENDIX H: PERFORMANCE RECOMMENDATIONS**

## Performance Recommendations

Performance recommendations are discussed in this Appendix relative to twenty-two (22) of the recreational activities which have been allocated to the recreational land use intensity zones which comprise the plan. These discussions are organized by individual activity and address goals, planning concerns, definitions, physical planning criteria, management techniques, economic incentives or cooperative arrangements, and recommendations for action concerning future recreational development. It should be recognized that only recommendations which are in keeping with the scale and detail of the information inventoried and addressed by this study are presented. No attempt is made to address very detailed or site specific performance standards which, although essential to the attainment of the recreational use objectives for each zone, are dependent upon a more comprehensive understanding of the particular environmental and cultural characteristics of areas within the various zones. Moreover, management techniques discussed are likely to be more suggestive than definitive in nature.

In general, the management techniques discussed may be found to be regulatory or manipulative in nature avoiding at this point in time, at least, such drastic management alternatives as condemnation and acquisition. Regulatory methods may include increased policy enforcement, zone(ing) regulations, or restrictions on use intensity. Manipulative methods may address physical alterations, information dispersal, or eligibility requirements. Figure H.1 identifies the inter-relationship between these management techniques and gives examples of specific actions relative to each. Not all of the techniques identified therein are directly applicable, or easily implementable, as part of a management program for the recreational resources of the Pinelands in equal levels of intensity. However, it is likely that at some point in the future, almost all of them may be appropriate for use. In fact, it might be argued that to some extent, however miniscule or subtle, they are presently being employed. Regardless, they are generally categorical in nature and are regarded as the context within which particular recommendations are made herein.

One method, increased policy enforcement, is deserving of particular attention due to its complicating far-reaching implications relative to the proper management of the recreational resources which may be affected by numerous activities. It automatically implies a need for appropriate (probably increased) staffing of enforcement personnel at many recreational facilities throughout the Pinelands, particularly in the state parks and forests (e.g. to curtail alcoholic beverage consumption and littering). Equally deserving of attention is the need for increased public awareness and appreciation of the Pinelands resources and the recreation experience available; thus reducing the need for enforcement activities.

The following is a presentation, by activity, of performance recommendations pertinent to the proper use and development of recreational resources of the Pinelands. Each discussion includes a statement of goals, a list of planning concerns or issues affecting present or future use, and a listing of the recreational land use intensity zones within which the activity is permitted, or likely to locate. Subsequent text identifies planning and design criteria, management techniques and or environmental incentives, and proposed alternative courses of action by the Commission, for the appropriate recreational use of the Pinelands. Both planning criteria and management proposals are concerned with providing for recreational land (and water) use which addresses the carrying capacity of the existing recreational and environmental resources and or the existing or proposed locations for facilities. A greater emphasis has been placed upon social

Type of Management: Regulatory

Method: Increased Policy Enforcement

Exemplary Actions:

- firmly enforce existing rules and regulations
- impose fines
- increase surveillance of Pinelands

Method: Zone Regulations

Exemplary Actions:

- spatial zoning of uses: disperse use to other areas as yet under capacity; zoning by activity or use intensity; close areas partially or completely
- temporal zoning of uses
- rotation of use areas
- extend time periods of use into more lightly used time periods
- limit duration of participation in particular activities

Method: Restrictions on Use Intensity

Exemplary Actions:

- require reservations/make assignments/ration
- require permits, certification or registration
- limit participation in accessory activities
- require registration at access points
- limit sizes of groups
- limit activities to specific use areas
- limit people per recreational activity unit per land/water size unit

Method: Physical Alterations

Exemplary Actions:

- open or close access points/roads
- emphasize or deemphasize location of access points
- enhance or degrade nature and quality of resource provided
- improve or permit degradation of access roads
- improve efficiency of all facilities through improved design and operation
- allow degradation of existing facilities
- enact on-going rehabilitation programs to rectify conditions of adverse impact
- rehabilitation, replacement or initial placement of facilities to enhance user access and/or quality of experience
- open or close facilities
- redesign facilities to require greater or lesser levels of skill to participate

Figure H .1 Management Techniques

**Method: Information Dispersal****Exemplary Actions:**

- advertise specific Pinelands attributes to attract particular user groups
- advertise underused recreational resources of the Pinelands
- do not advertise Pinelands attributes likely to attract undesirable user groups or promote conflicting uses
- do not advertise overused recreational resources of the Pinelands
- improve awareness of recreational choice options
- educate users regarding proper use of recreational resources of the Pinelands and ecological sensitivity of particular areas
- provide guided tours and other area time structured experience

**Method: Eligibility Requirements****Exemplary Actions:**

- increase/decrease/eliminate entrance fees
- increase/decrease participation requirements according to levels of skill and experience
- impose equipment requirements for health/safety
- improve/degrade efficiency of all programs
- require educational training prior to participation

Figure H .1 Management Techniques (continued)

capacity, the capacity most appropriate for participant satisfaction according to the recreational use objectives and goals for each zone. Physical capacity, the capacity most appropriate for resource protection, has been taken into consideration; however, it may be more comprehensively addressed as part of some future more detailed studies.

### Camping

**Goals:** To increase the quantity and quality of the opportunities for participation in camping activity in the Pinelands in ways which allow for the enhancement, or, at a minimum, maintenance of the existing environmental and recreational character of the use intensity zones. In addition to the provision of future camping facilities similar to those which already exist, a more diverse level of experience may be provided through the provision of relatively primitive individual small group camping opportunities.

**Planning Concerns:** The following is a listing of the issues which were taken into consideration in allocating camping facilities within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- relationship to other recreational activity in the zones
- profitability associated with the operation of low density/low amenity facilities
- the relationship of access, maintenance and surveillance needs to the enhancement of the quality of a remote camping experience
- location of existing camping facilities
- relationship to the existing environmental resources; particularly proximity to potential components of the wild and scenic river system and waterbodies, in general
- relation to adjacent land uses, transportation routes and regional attractions
- permitted types of camping facilities (cabins v. trailer v. tent sites) and their relationship to one another within the campground
- use level at existing facilities of a similar nature
- campground design and internal organization of use areas
- recommended form of ownership (public v. private)
- minimization of surface water run-off
- disposal of sewage effluent
- location of facilities in proximity to access roads; vis-a-vis maintenance and surveillance requirements
- location of facilities in proximity to access roads; vis-a-vis disruption of the camping experience
- design of structural elements and their visual and scale relationship to the surrounding environment and appropriateness relative to the existing natural environment
- vegetation screen and buffers to maintain the visual integrity of key scenic resources and avoid adverse impact on critical areas
- the location of camping facilities; vis-a-vis their visual relationship to adjacent potential wild scenic and/or recreational rivers
- amenities/services to be provided
- existing problems and conflicts (particularly those associated with misuse)
- administrative regulations
- relationship to horsebackriding as an accessory or principal activity

- relationship to hiking trails and routes of travel
- priorities and implementation strategy

### Campground - low intensity

**Definition:** A developed campground, accessible by car, which provides camp-wide amenities. The camping experience which may be achieved is variable, as both small trailers and tents are permitted. The density of permitted campsites per acre is relatively low to allow for a relatively compatible relationship between campground development and the existing natural environment.

**Applicable Zones:** High  
 Moderate  
 Low  
 Recreational Node

**Performance Requirements:** No minimum campground size is required. A gross density of five (5) campsites per acre is considered an absolute maximum. Campground amenities may include water, sanitary facilities and/or electric; however, they may not be provided in the form of hook-ups to recreational vehicles. Cabins or lean-tos, designed in keeping with the existing site character, are permitted and tent sites must comprise a minimum of twenty-five (25) percent of the total provided. Sites should include a minimum of 4000 square feet with a minimum of 125 feet between sites measured from centroid to centroid. Tent sites shall include a cleared area measuring 15 feet X 15 feet. Trailer sites shall incorporate a prepared apron measuring a maximum of 40 feet X 12 feet; whereas parking adjacent to the cleared area for tent sites, or cabins, shall not exceed 30 feet X 12 feet. Total parking may be incorporated within the campsites or in common parking areas and shall allow for five (5) spaces for each four (4) campsites within the campground, with stalls measuring 10 feet X 20 feet with the total parking area allowing 350 feet per parking stall. Paved parking areas shall be constructed of porous materials.

No campsite shall be less than 100 feet from a public road right-of-way, or 50 feet from a property line. Landscaped buffers providing a continuous visual buffer 4 feet high (minimum) shall be required in areas abutting existing residential land use where the intervening area is not composed of natural woodland cover. Adjacent to State Recreational and Wild and Scenic Rivers or National Wild and Scenic Rivers no sites shall be located closer than 100 feet from the 'water's edge' (mean high tide where applicable); only tent sites may be located within 350 feet of the 'water's edge' and any structures erected within 1000 feet of the center line of the river shall be located and designed so as to minimize visual intrusions to the greatest extent practicable. All site development not superseded by the provisions set forth above, shall be in accordance with Chapter XI of the New Jersey Sanitary Code. In addition, fires in campgrounds located on State lands shall be by permit only.

**Management:** The most applicable technique is the enforcement of existing rules and regulations. Ownership may be public or private.

**Economic Incentives and Cooperative Arrangements:** The only incentive offered for consideration relative to this is the possible lease of public lands to private campground concessionaires.



Alternative Courses of Action: The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. Develop a cooperative working relationship with the State Division of Parks and Forestry and Bureau of Parks Management in order to become an integral component of their decision making process relative to the need, location, planning and design of future recreation facilities.
2. A study should be undertaken to determine the potential for provision of such facilities by the private for-profit sector, or the manner in which cooperative arrangements could be established between the public and private sectors; e.g., franchises, land leases, etc. Perhaps a pilot project could follow.
3. The commission should support requests by the Division of Parks and Forestry for funding for future facilities, particularly as they may provide for a greater diversity of camping opportunities, or provide opportunities for camping in areas not served.
4. The Division should also be strongly supported in making any requests for increased staff funding for maintenance and surveillance personnel.
5. The commission should discourage the development of such campgrounds in the near future in proximity to areas of concentrated private high intensity campgrounds to reduce, or at least not aggravate, the perceived conflict with private industry, as the perceived conflict seems to relate directly to the proximity of new state facilities to existing private campgrounds.
6. Survey users of such facilities now in operation to determine reasons for visitation and preference criteria which make these campgrounds more desirable than the higher density (greater amenity facilities) and, to gain a better understanding of the types of experiences being sought and the facilities preferred.
7. Monitor fees charged for use of such facilities in order to help maintain a realistic relationship between the state and private industry rate structures. This relationship should be determined through a survey of private campground owners and campground administration in order to uncover bona fide injustices, if they exist.
8. The Commission should recommend that State facilities be brought into full compliance with Chapter XI of the New Jersey Sanitary Code in order to reduce perceived injustices relative to the regulations governing private industry facilities.
9. The commission should most enthusiastically support the provision of camping opportunities which are not likely to be provided by the private sector.

### Campground - high intensity

**Definition:** A highly developed campground, accessible by car, which provides for a full range of camping experiences. Campsites may provide simple accommodations for tents, or more elaborate accommodations for a range of camping vehicles, from small trailers through large mobile homes, featuring individual hook-ups for water, sewer or electrical service, if desired. The density of permitted campsites per acre is relatively high to enhance the potential for economic profitability.

**Applicable Zones:** High  
Recreational Nodes

**Performance Criteria:** No minimum campground size is required. A gross density of eight (8) campsites per acre is considered to be an absolute maximum. Campground amenities may include water, sanitary facilities and/or electric, which may be provided as hook-ups to recreational vehicles. Cabins, lean-tos designed to relate to the existing site environment, or tent sites may be provided but are subject to no minimum requirements. Trailer sites should include a minimum of 2500 square feet, with a minimum of 100 feet between sites measured from centroid to centroid. Trailer sites shall incorporate a prepared apron measuring a maximum of 50 feet X 12 feet. Overall parking including that within trailer sites shall equal three (3) off-street parking spaces for each two (2) campsites provided in common parking areas and/or on individual campsites. Paved parking areas shall be made of porous materials. Minimum dimensions for parking spaces shall be 10 feet X 20 feet with the total parking area in any common parking lot equal to 350 feet per parking stall. Campgrounds located adjacent to State Recreational and Wild and Scenic Rivers or National Wild and Scenic Rivers shall comply with the minimum setback requirements outlined above for campgrounds - low intensity. All site development not superceded by the provisions set forth above, shall be in accordance with Chapter XI of the New Jersey Sanitary Code.

**Management:** The most applicable technique is the enforcement of existing rules and regulations. These campgrounds may be publicly or privately owned, although private ownership is preferred. An investigation should be made relative to the desirability and suitability of 'condominium camping', and the possible adverse or beneficial impacts which may be associated with it, as it appears to be a coming phenomenon and may become popular within the Pinelands.

**Economic Incentives and Cooperative Arrangements:** The only economic incentives proposed include provisions for the relaxation of standards for gross density and minimum campsite size and separation in areas of prohibitive land cost if it can be proved that an absolute economic hardship would otherwise preclude development. This relaxation of standards, however, should only accommodate the minimum required to attain normal Pinelands high intensity campground industry profit levels.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. The Commission should conduct an evaluation of Chapter XI of the New Jersey Sanitary Code in order to determine the need for omissions and/or additions which may be needed to allow for the effective, yet practical (in all respects), maintenance and enhancement of Pinelands environmental resources.

2. The commission should conduct a survey to determine an accurate level of demand for such campgrounds, in particular areas with the Pinelands; particularly as such areas may be located outside the zones designated for such use as part of this study. The study should identify ways to encourage the development of high intensity campgrounds in these areas
3. A detailed economic analysis of the campground industry should be conducted with a principle focus upon the determination of the minimum number of units per acre required to operate such a campground profitably, assuming reasonable industry profit levels. This will serve to identify a bottom line for the development of such facilities and will be helpful in evaluating their appropriateness in other zones, if demand suggests such locations, or the need for the State to intercede. It may also be appropriate to raise minimum densities in the zones identified above to allow for future development, particularly as land costs rise inordinately in the vicinity of Atlantic City.
4. The Commission should consider the need for the State to sell or lease land to potential operators in areas where land costs (particularly in the Atlantic City area) would otherwise preclude the development of campgrounds (assuming the need for such facilities).
5. Promote the formation of a Pinelands Camping Association (analogous to existing county and regional associations) comprised of private campground owners, State Tourism and Parks and Forests officials and members of the Commission, itself, to establish a healthy cooperative relationship in order to work together to monitor and promote camping opportunities.
6. Survey users of such facilities now in operation to determine reasons for visitation and preference criteria which make these campgrounds more desirable than the smaller 'no frills' facilities.
7. The Commission should conduct an evaluation of the adverse impacts and/or benefits which may be associated with 'condominium camping', an apparently growing phenomenon in the Pinelands.

#### Campsite (primitive) - Individual

**Definition:** A minimally developed campsite, accessible by foot, horse or canoe, which provide space for tents to accommodate from two (2) to five (5) persons. The only amenity likely to be provided is a small pit privy, particularly at the sites accommodating more than two (2) persons. These sites are intended to provide for the maximum appreciation of the existing natural-environmental quality of the most remote areas of the Pinelands, and are considered to cause a minimal amount of environmental disruption.

**Applicable Zones:** Very low

**Performance Criteria:** The campsites shall be comprised of a cleared area(s) for tents measuring a maximum 15 feet X 15 feet. Campsites shall be located to maximize ease of surveillance and maintenance on foot or horseback (i.e. within walking distance to maintenance roads, which are ideally not public roads); and shall be generally located within 1/4 mile of the Batona Trail, but in no case shall they be within 500 feet of the Trail or within 100 feet of any water body. Proximity

to State Recreational and Wild and Scenic Rivers and National Wild and Scenic Rivers shall be limited to a minimum of 350 feet. Sites shall be no closer to one another or any other campsite than 1500 feet. Access shall be solely by foot, horse or canoe (only for sites located within reasonable proximity of canoeing rivers). Paths leading to and from tent sites shall not exceed 3 feet in width. Capacity of individual sites shall be generally limited to two (2) persons; however, ten (10) percent of the sites shall provide for a maximum capacity of five (5) persons. (Such sites may include cleared areas larger than specified above to accommodate larger tents.) Marking of site and paths leading to them shall be the minimum necessary for identification. Amenities shall include, if necessary, only a small pit privy located for convenience, odor control and maintenance adjacent to the site.

**Management:** Only public ownership is recommended for such facilities. Fires are allowed only by permit; and it is understood that such permits may not be issued during periods of extreme fire hazard. Reservation, registration and assignment of sites shall be mandatory and campers shall be informed of rules and regulations governing use and asked to attest knowledge of same. Informative material supplied to the prospective campers shall identify penalties for improper use including the imposition of fines for use of unauthorized fires. In addition, unauthorized use of sites and failure to register shall be punishable by law. Duration of use by any camping unit shall be limited to a maximum of one (1) night per reservation. No minimum is suggested for the overall number of sites. In fact, it is suggested that a minimum number of sites are provided initially and monitored on a trial basis. Additional facilities may be provided periodically according to the degree of success initially encountered. Use of these camping facilities should occur on a rotational basis to allow for adequate environmental recovery of the adjacent lands.

**Economic Incentives and Cooperative Arrangements:** The only programs foreseen are the sale of specialized supplies conducive to a successful camping experience. Sale may be by private or public agents with facilities probably located in the vicinity of the proposed Chatsworth, Atsion or Batsto/Pleasant Mills Recreational Nodes.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. The Commission should adopt the provisions of the Very Low Recreational Land Use Intensity Zone as set forth in this study and adopt any land use provision as part of the overall Pinelands Comprehensive Management Plan which support their implementation.
2. Lobby with the Division of Parks and Forests for a pilot program to establish such individual sites on a trial basis. A monitoring program should ensue; and, if successful, the program should be expanded with the Very Low Zone.
3. Encourage the Division of Fish, Game and Wildlife to also embark on such pilot projects to take advantage of the significant camping potential in the State Wildlife Management Areas.
4. Monitor campground conditions and make management recommendations for relocation to provide for landscape regeneration.

Campsite (primitive)- group

Definition: a minimally developed campsite, accessible by either car, horse, or on foot, which provides a large contiguous area for tents to accommodate a maximum of 150 persons (large) to a minimum of 50 persons (small). Amenities to be provided are a pump well and pit privies. These sites are intended to provide for a relatively primitive camping experience and allow for an appreciation of the existing natural quality of a large portion of the Pinelands Forest Regions. Their development, maintenance and management should occur with a minimum amount of environmental degradation.

Applicable Zones: Low  
Very Low

Performance Criteria: Group camps may range in size between large (maximum 150 persons) or small (maximum 50 persons), and may be accessible by car, horse or on foot. Within the Very Low Recreational Land Use Intensity Zone only small camps accessible on foot or horseback shall be permitted. At least one small camp, devoted exclusively to use by horsebackriders, shall be provided within either of the applicable zones and shall contain a pole barn for the accommodation of horses, supplies and equipment overnite by trailriding groups. Such a facility is not necessary at other camps accommodating horsebackriders. All sites must contain water and sanitary facilities consisting of no more than pit privies and a pump well. Campsites shall be located to maximize ease of surveillance and maintenance, but they shall be a minimum distance of 300 feet from any designated hiking or horse trails, and 500 feet from any canoeing river. Campsites shall be placed a minimum distance of two miles from each other. Paths leading to and from the campsites shall not exceed 5 feet in width. Overnite accommodations for horses in camps providing for use by hikers and horsebackriders shall be provided in a location adjacent to the campsite but removed from tent sites and areas designated for parking motor vehicles. Parking shall be located as far from the site as is deemed reasonable or designed so as to minimize, to the greatest extent practicable, visibility from the campsite. Vegetation removal in parking areas shall be kept to a minimum. Parking spaces shall measure 10 feet X 20 feet, with an overall allowance, within a given parking area, of 350 feet per parking stall. Parking areas shall not be paved.

Management: Only public ownership is recommended for such facilities. Reservation, registration and assignment of sites shall be mandatory and campers shall be informed of rules and regulations governing use and asked to attest knowledge of same. Fires are to be allowed by permit only. Informative material provided to prospective campers, shall identify penalties for improper use including the imposition of fines for the use of unauthorized fires. Moreover, failure to register for use of sites shall be punishable by law. Duration of use by any camping unit shall be limited to two (2) nites per registration. Use of these facilities should occur on a rotational basis to allow for adequate environmental recovery of the adjacent lands. Other management shall be in accordance with current practices employed in the administration of existing similar facilities in Wharton State Forest by the Division of Parks and Forestry.

Alternative Courses of Action: The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. The Commission should support and even help to initiate requests for increased parks and forests enforcement personnel to curb existing problems associated with the use of group camps and insure a more satisfactory level of use of additional future facilities.
2. Petition the Division of Parks and Forestry to create in the immediate future, some additional group camps to initiate a rotation and regeneration program for the existing facilities.
3. Conduct an evaluation of the compatibility of horseback riders and other campers and existing facilities and means for the overnite accommodation of horses and promote the development of separate group carrying areas for horseback riders and increased facilities, such as pole barns, if necessary or desirable.
4. Seek involvement in the selection of sites for future facilities; and strive for participation in the development of planning and design criteria for them.

#### ORVs

Goals: To maintain and promote opportunities for the use of four-wheel drive vehicles and trail motorcycles (for both enduro (organized motorcycling events) and unorganized or individual purposes) in a way which minimizes the environmental impact which might otherwise occur. Provisions for the use of ORVs in the Pinelands shall address the need for developed and confined use areas and the designation of locations and schedules for use of existing roads and trails.

Planning Concerns: The following is a listing of the issues which were taken into consideration in providing for ORV use within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- the different types of off-the-road vehicles including: four-wheel drive cars and trucks, trail motorcycles, snowmobiles and all-terrain vehicles (ATVs)
- potential for loss of the use of existing trails through state purchase and future regulation of land which is presently held in private ownership, upon which such use has been allowed
- projective future locations and site criteria for the location of ORV use areas
- existing popularity and use levels and potential increased demand for participation in such activities in the Pinelands
- regulations presently governing use of roads and trails, particularly on state lands
- incompatibility in space and time between ORV use and other recreational land uses
- incompatibility with existing adjacent land uses
- potential for future development to encroach upon, disrupt or eliminate existing trail use
- damage to road and trail surfaces
- environmental degradation to sites and areas adjacent to trails
- major problem of indiscriminate use of roads, trails and even vegetated areas by irresponsible individuals and groups primarily concerned with 'thrill seeking' activities
- administrative and enforcement problems associated with the protection and control of extensive linear unconfined facilities

- concern about organized and unorganized new 'trailblazing' activity
- adverse effects on wildlife and habitats due to use and 'trailblazing' activity
- use in areas of unique natural resources (pine plains)
- liability issues governing activity in designated use areas/trails

### ORV (use area)

Definition: An enclosed area or designated trail (system), operated on a scheduled basis, allowing for use by all types of off-the-road vehicles. Ideally, such areas will be located upon land so as to minimize potential environmental degradation on and adjacent to the site. In particular, vegetatively barren sites shall be considered most desirable (e.g. abandoned sand and gravel pits, sanitary landfills, etc.). Such use sites will probably have to be provided on municipal, county or state owned lands.

Applicable Zones: High  
Moderate

Performance Requirements: A minimum area of twenty (20) acres is required for designation as an ORV use area. Such area shall be fenced along its entire perimeter with access provided off a public road at only one point. Such access shall be secured during periods of designated non-use. Facilities should be located in abandoned areas of sand and gravel extraction, closed sanitary landfills or other similarly barren sites, whenever possible. Buffers in the form of intervening land, fencing, or vegetative screening shall be provided adjacent to existing land uses to insure compliance with existing State and Federal noise regulations, and to minimize visibility, to the greatest extent practicable.

Management: ORV use shall be prohibited within the zone of very low recreational land use intensity. In fact, vehicular use of any roads within this zone shall be limited to those roads needed for access to campsites, use for surveillance and or maintenance purposes and those roads absolutely essential to the proper distribution of traffic according to established flow patterns. Use of public roads by ORVs on public lands in any recreational use zone shall be limited to roads designated specifically for such use. ORVs should be prohibited from the use of any roads not open to the public. Moreover, use of private roads shall require permission of the landowner in question. Use of ORVs, whether on public or private land, in areas of natural vegetative land cover shall be prohibited/discouraged throughout the Pinelands.

Economic Incentives and Cooperative Arrangements: The State of New Jersey, through its Green Acres Program, should offer assistance to counties and/or municipalities to finance the planning, design and implementation of ORV areas in locations of significant demand within the Pinelands.

Alternative Courses of Action: The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. The Commission should strongly support the prosecution of violators of existing rules and regulations governing ORV use, and join with other State agencies in seeking staff funding for enforcement of them.
2. The Commission should enlist the cooperation of the various organized ORV user groups (e.g. New Jersey Beach Buggy Association) in monitoring existing use and aiding in enforcement practices.

3. Support the prevailing Department of Environmental Protection Trails Master Plan.
4. Promote the designation and management of suitable trails for seasonal use by snowmobiles.
5. Discourage new trailblazing activity.
6. Negotiate the cessation of use areas of unique natural resources; particularly private lands.
7. Seek designation of use areas in locations which minimize conflicts with other recreation activities and land uses.
8. Seek restriction of certain forms of ORV use to public roads.
9. Make provisions for exceptions on a permitted scheduled basis for particular forms of recreational activity (hunting, birdwatching, etc.) or means of livelihood (gathering, trapping, etc. ).
10. Seek funding from the State for the acquisition of land for use by ORVs, but negotiate administration and operation of facilities by municipal governmental entities.
11. Seek cooperation of governmental, industrial and private landowners to construct physical barriers to access to lands not designated or appropriate for such use.

#### ORV - motorcycling (enduros)

**Definition:** These areas are comprised of systems of trails identified specifically for use for organized competitive time and distance motorcycling events. They are maintained for such purposes by local enduro clubs who also designate trail routes for annual use.

**Applicable Zones:** High  
 Moderate  
 Low  
 Recreational Node

**Performance Requirements:** Enduro activity within the Pinelands is absolutely prohibited in the Bay and Very Low Recreational Land Use Intensity Zones.

**Management:** Enduro activity on public lands should be prohibited during the time period May 15 to September 15. Moreover, use outside of that time period shall require permission by the appropriate agents of the Department of Environmental Protection. Trail routes shall be mapped and submitted with an application for a permit and areas proposed for future clearing (where an existing trail is not already located) shall be clearly identified for the reviewing agent, who shall be required to issue a separate permit for such trailblazing activity. Trail dimensions (length and width) shall be described and copies of the maps shall remain in custody of the reviewing agency. Maps of existing facilities shall be filed with the Commission within ninety (90) days of the adoption of this plan.



Such submission must include proof of the existence of such facilities as future proposals will be judged according to their location on existing trails, or as proposals for future trailblazing. Use of private lands for enduros is not subject to any temporal restrictions.

Enactment of these provisions will involve cooperation between the State and the enduro groups, who both shall seek to provide each other with data conducive to the mutual exchange of necessary information. Other arrangements are left to the discretion of the relevant landowners, municipal governments and enduro organizations themselves.

**Economic Incentives and Cooperative Arrangements:** The State shall not require fees for the submission of applications for permits or the use of State Lands for organized enduro activity.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. Formalize enduro trails and regulate their use to avoid user conflict and environmental degradation.
2. The Commission should seek involvement in the permit process for conduct of enduros on state and privately-owned land in the Pinelands.
3. The commission should monitor the use of existing trails and trail networks and limit future trailblazing to only the most appropriate areas; or areas as necessary for the overall health of the trails system and surrounding environment.
4. Assist in the formation of a Pinelands-wide Enduro Management Association comprised of motorcyclists, private land-owners and governmental agencies to establish programs for the continued use of an enduro trails system which in ways which are in keeping with the overall environmental objectives for the Pinelands.
5. Offer trail alternatives and negotiate the discontinued use of public and private lands, for enduro activity, which are the probable habitat of various rare, endangered, threatened or unique or critical plants and animals.
6. Suggest alternative locations for enduros which had been heretofore located in the zone of Very Low Recreational Land Use Intensity.
7. Enlist the cooperation of the various organized ORV user groups (e.g. East Coast Enduro Association) in monitoring existing use and aiding in enforcement practices.
8. Promote the demarcation of a buffer zone around the zone of Very Low Recreational Land Use Intensity, as such activity is incompatible with the proposed use of that zone.
9. Support the prevailing Department of Environmental Protection Trails Master Plan.

## Hiking/Horsebackriding

---

**Goals:** To provide for the maintenance, enhancement and diversity of hiking and horsebackriding activity in the Pinelands in a manner in keeping with overall environmental objectives and attainment of maximum enjoyment of the recreational experience, through either the expansion of existing facilities or the creation of new ones.

**Planning Concerns:** The following is a listing of the issues which were taken into consideration in providing for hiking and horsebackriding use within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- the compatibility concerns associated with the combined use of trails and other recreational facilities by hikers and horsebackriders
- need for horsebackriding facilities in the Pinelands
- use levels and overcrowding which may be associated with use in the various zones within the Pinelands, and deteriorating quality of experience for some uses
- underutilized potential for use in many areas throughout the Pinelands
- development encroachment on existing trails
- private ownership of trail rights-of-way and loss of trail continuity
- need for facilities to accommodate organized group horsebackriding events (e.g. trail rides)
- trail maintenance
- opportunity for the provision of trail-related facilities

### Hiking Trails

**Definition:** A designated linear system of pathways or roads or a combination of the two suitable for use for the pedestrian enjoyment of the environment of the Pinelands. They are generally located on publicly-owned land; however, some, such as the Batona Trail, may traverse private holdings, and incorporate the need for easements of access.

**Applicable Zones:** High  
 Moderate  
 Low  
 Very Low  
 Recreational Node  
 Bay

**Performance Requirements:** No new trails are proposed for location in the Very Low Recreation Land Use Intensity Zone. Moreover, use of trails in this zone, particularly the Batona Trail, should be monitored (by the Batona Hiking Club and others) to assess potential crowding problems. It is generally assumed that use of trails in this and the Bay Zone should not exceed numbers which violate loading equal to five hiking groups (a related hiking party consisting of one or more individuals) per mile, travelling in the same direction. Trails in these zones should strive for a maximum width of 4 feet. Bay soils may require boardwalk paths in unstable areas. Trails in the Low zone should strive for a limit of twenty-five (25) persons per mile, while other zones would be subject to a maximum of fifty (50) persons per mile, travelling in the same direction. Trails in the Low Zone should be no more than 6 feet wide and trails in other zones no more than 8 feet in width.

**Management:** Hiking trails should be located on public lands. Advertisement of the Batona Trail should be kept at its present level. Many more opportunities exist for the location of hiking trails in the Low zone on public lands and the State should begin to take advantage of existing resources. Further suggestions for management await monitoring and reaction to existing conditions.

**Economic Incentives and Cooperative Arrangements:** The Pinelands Commission should direct a portion of its acquisition program toward the purchase of land to insure the location of the Batona Hiking Trail and other potential trails routes on public land.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendation set forth above.

1. Support the prevailing Department of Environmental Protection Trails Master Plan.
2. Adopt the provisions of the Very Low Recreational Land Use Intensity Zone and provide for the opportunity to take part in a remote area hiking and camping experience in the pinelands.
3. Support a system for the designation of roads for vehicular and/or hiking use.
4. Survey existing trail use by hikers to determine the need for increased trails and related facilities.
5. Cooperate in the acquisition of key trails rights-of-way and segments of rights-of-way (e.g. Batona Trail).
6. Promote use and potential multi-use of existing rights-of way.
7. Develop, in conjunction with the Department of Environmental Protection, a comprehensive Pinelands-wide network of trails linked to other facilities to provide for the enjoyment of a diverse trail hiking experience over an extended period of time.
8. Utilize the development review process to protect existing trail segments from encroaching development.

#### Horsebackriding

**Definition:** Individual and/or group use of the Pinelands for organized or unorganized trail riding which may correspond to day use or activity over an extended period of time; and, may be a primary/singular activity or may be done in conjunction with other recreational activities.

**Applicable Zones:** High  
 Moderate  
 Low  
 Very Low  
 Recreational Node  
 Bay

**Performance Criteria:** One of the principal considerations associated with the use of horse trails is the need for areas to provide parking for trucks and trailers. It would be most desirable to eliminate such facilities within the Very Low Recreational Land Use Intensity Zone. If facilities must be provided within the zone they should be confined to areas at the periphery, or along existing paved public roads. Paved road locations are also desirable in other zones. Horseback-riding should be prohibited along the Batona Trail. Other trails may be single or multi-purpose in nature. Multi-purpose trails should be designed for the widest expected use; however, tread width should probably not exceed 8 feet. Riding trails where no pack stock is used can be as little as 3 feet wide with passing areas about every 1000 feet. A pack trail requires 8 feet of clearing, although the tread may be considerably narrower. Capacity in the Very Low Zone should be approximately two (2) riding groups per mile of trail, with higher levels permitted along trails in other zones up to a maximum of twenty (20) horses per mile.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. Support the prevailing Department of Environmental Protection Trails Master Plan and use it as a basis for further trails planning and development within the Pinelands.
2. Encourage the New Jersey Trailride Association to take the lead role in organizing trailriding clubs to assist in the formulation of policy and the actual marking of trails and construction of trailhead facilities.
3. Perform studies and user surveys to assess intensity of use, horseback-riding use, and demand for facilities.
4. Establish standards for horse facilities including access, parking, campsites, waste disposal, and trail marking.
5. Assess the need for camps and campsites exclusively for overnight use by horsebackriders.
6. Recommend that the Division of Fish, Game and Wildlife consider a greater use of lands under their administration for such use.
7. Study the feasibility of creating a 'mounted patrol' of trained volunteers to aid in surveillance and provide search and rescue type services.

### Bicycling

**Goals:** To promote the creation of facilities which provide for safe and enjoyable bicycling experiences in the Pinelands, whether for short distance trips or touring.

**Planning Concerns:** The following is a listing of the issues which were taken into consideration in providing for bicycling use within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentives.

- the large number of designated bicycle routes and the small number of developed facilities for bicycling within the Pinelands
- safety considerations
- compatibility with conditions of existing sand roads
- marking of routes
- advertisement of routes
- relationship of bicycle routes to other recreational facilities
- parking problems in New Jersey seashore towns

### Bike Routes

**Definition:** Designated linear network of roads for use in making short trips or touring in or moving within or through the Pinelands on route to or from the seashore.

**Applicable Zones:** High  
Moderate  
Low  
Very Low  
Recreational Node  
Bay

**Performance Requirements:** Bicycle Routes should become more than mere namesakes throughout the Pinelands. Very few routes have actual facilities to accommodate bicycle traffic. Moreover, signage is desperately needed to identify existing travel routes. It is suggested, therefore, that routes within the Pinelands be upgraded to existing standards. Bicycle routes not located within the rights-of-way of existing public paved roads shall be prohibited in the Low and Very Low Recreational Land Use Intensity Zones.

**Management:** Management is relegated to State and local authorities having jurisdiction over existing rights-of-way within which the existing bicycle routes are located.

**Economic Incentives or Cooperative Arrangements:** It is recommended that the State Department of Transportation take the initiative in the provision of actual bicycling facilities within the rights-of-way of existing roads designated as bicycle routes within the Pinelands.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. The Pinelands Commission must promote the creation of 'bike trails' which provide for the exclusive safe use of areas within the designated bike routes.
2. The Commission should promote the advertisement of the use of bicycle routes for transit through and particularly within the Pinelands.
3. The Commission should seek the establishment and development of additional routes which allow for safe and enjoyable passage by bicycle between selected points of interest within the Pinelands; and, particularly between the Pinelands and the seashore.

Power Boating

Goals: To allow for an enjoyable power boating experience in the Pinelands consistent with the provision of the Pinelands Protection Act and the need to preserve and enhance the existing salt and freshwater ecological systems.

Planning Concerns: The following is a listing of the issues which were taken into consideration in providing for power boating use within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- bank deterioration along the banks of tidal rivers due to wave action created by large boats
- water quality concerns; vis-a-vis fuel spills
- conflict with other uses, particularly fishing and canoeing
- wetlands preservation
- wildlife impact and habitat disruption
- the provisions of the State Wild and Scenic Rivers Program

Power Boating (>10 horsepower)

Applicable Zones: High  
Moderate  
Bay

Performance Requirements: No power vessel in excess of 10 horsepower shall operate on State waters within the Pinelands except: on the Mullica River downstream from Route 542, and on the Wading River downstream from its confluence with the Oswego River.

Power Boating (<10 horsepower)

Applicable Zones: High  
Moderate  
Low  
Recreational Node  
Bay

Performance Requirements: Power boats operating on rivers and lakes within the Low Recreational Land Use Intensity Zone shall be limited to electrically powered vessels unless in use for industrial, maintenance or surveillance purposes.

Alternative Courses of Action: The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. It is recommended that the Pinelands Commission lend strong support to the New Jersey State Wild and Scenic Rivers program.
2. The Commission should support requests for increased staffing for enforcement.

## Boat Launches/Marinas

---

**Goals:** To promote the use of developed facilities for access to water bodies which are in keeping with the nature of the recreational experience appropriate to a particular recreational land use intensity zone, and which minimize environmental degradation at the point of access or storage of boats.

**Planning Concerns:** The following is a listing of the issues which were taken into consideration in providing for boat launches and marinas within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- existing problems and/or conflicts
- public v. private ownership
- streambank erosion
- the provision of the New Jersey State Wild and Scenic River Program
- the nature of the recreational experience being sought in a particular recreational land use intensity zone
- accessory needs such as parking
- environmental impacts due to construction

### Boat Launch - car-top

**Definition:** a small launch facility which allows for the manual placement of small boats and canoes in the water from a hard surfaced landing moored or fixed to a location at the water's edge

**Applicable Zones:** High  
 Moderate  
 Low  
 Very Low  
 Recreational Node  
 Bay

**Performance Requirements:** No additional car-top launches shall be located within the Very Low Recreational Land Use Intensity Zone. Future facilities in other zones may only be constructed along existing public roads and parking shall be provided immediately off-street, but adjacent to the roadway, located so as to minimize, to the greatest extent practicable, visibility from the water body. Parking areas shall be made of porous material and spaces shall measure 10 feet X 20 feet and shall provide for a minimum of 300 feet per car within the parking area. Parking areas shall be able to accommodate a minimum of five (5) cars.

**Management:** Such installations shall require the developer to acquire a permit from the Pinelands Commission before commencement of construction.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. It is recommended that the Commission, in conjunction with the relevant State agencies (DEP, FGW, etc.) conduct an inventory of existing streams, lakes and rivers and assess the need for such facilities at existing access points.

2. The Commission should aid in the assessment of the need for new facilities to be located at new access points.
3. The Commission should participate in the development of planning and design criteria for launch facilities in keeping with the Pinelands environment.
4. The Commission will need to support funding requests for the creation of such facilities as part of the overall management of access to the waters of the Pinelands.
5. Recommendations for new facilities should be coordinated with the State Wild and Scenic Rivers Program.

#### Boat Launch - ramp

Definition: A ramp facility allows for the launching of small and medium sized sail and motor boats at the water's edge by rolling a trailer into the water and mechanically raising or lowering the craft. The facility is generally constructed of hard durable water resistant materials such as concrete.

Applicable Zones: High  
 Moderate  
 Low  
 Recreational Node  
 Bay

Performance Requirements: Ramp facilities shall be limited to one unit per closed water body (lakes, ponds, other impoundments) within the Low Recreational Land Use Intensity Zone. Parking must be provided equal to a maximum of one (1) space for every five (5) acres of water surface. Parking areas shall be constructed of porous materials and located so as to minimize, to the greatest extent practicable, visibility from the water body. One-half (1/2) acre of parking shall be provided per ramp with 1750 feet of paved area, including ramp facilities per car.

Alternative Courses of Action: The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. It is recommended that the Commission, in conjunction with the relevant State agencies (DEP, FGE, etc.) conduct an inventory of existing streams, lakes and rivers and assess the need for such facilities at existing access points.
2. The Commission should aid in the assessment of the need for new facilities to be located at new access points.
3. The Commission will need to support funding requests for the creation of such facilities as part of the overall management of access to the waters of the Pinelands.
4. The Commission should participate in the development of planning and design criteria for launch facilities in keeping with the Pinelands environment.



5. Recommendations for new facilities should be coordinated with the State Wild and Scenic Rivers Program.

### Marina

**Definition:** A facility for the storage, mooring and maintenance of small pleasure craft. In addition, supplies may be purchased at the marina and ready water access is provided.

**Applicable Zones:** High  
Moderate  
Bay

**Performance Criteria:** The principal variations associated with marina design will be governed by the size and design of boats using a given facility. However, all existing and future marinas shall seek to minimize, to the greatest extent practicable, any adverse impacts upon the natural resources of the site including ground and surface water pollution, bank erosion and disruption which may result to existing ecological communities from construction, maintenance or normal operations. Local ordinances and review procedures shall address compatibility with existing adjacent land uses and provide for the minimization of any resultant adverse impacts.

**Management:** It is recommended that all existing rules and regulations be enforced to the fullest and compliance be sought with all existing performance requirements.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. The Commission should research the market demand for such facilities and make recommendation regarding future need.
2. It is recommended that the Commission evaluate the need for more State or private marinas.
3. The Commission should encourage the Office of Marine Services to perform timely functions related to the provision of accessory service (e.g. channel marking).
4. The Commission should make recommendations regarding planning and design criteria and zoning provisions for marinas.
5. Evaluations of the appropriate location and design of new facilities should consider effects upon the State Wild and Scenic Rivers Program, among others.

### Canoeing/Boating (non-motorized)

---

**Goals:** To provide for the growing demand for such activities in a way which is compatible with the protection and enhancement of the hydrologic ecology and overall Pinelands environment, and which serves to correct or ameliorate existing problems of overcrowding, misuse and safety. Opportunities for use shall strive for diversity by fostering conditions which allow for different types of boating experiences.

Moreover, levels of use and traffic volumes should be controlled in conjunction with the provision of a diverse selection of recreational experiences (e.g. wild and scenic low volume v. recreational/high volume).

**Planning Concerns:** The following is a listing of the issues which were taken into consideration in providing for non-motorized canoeing/boating within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- overcrowding of existing canoe runs
- types of recreational experience being sought
- environmental degradation of shoreline and adjacent areas
- relationship to the State Wild and Scenic Rivers Program
- present number and location of water access points
- safety considerations
- increased demand for participation in such activities
- relationship to accessory recreational activities (e.g. camping or fishing)
- additional waters which represent unused opportunity for use
- development encroachment upon water bodies
- commercial canoe livery operations v. use by the general public
- level of experience needed for participation
- maintenance
- need for more facilities; i.e. access points, developed launch facilities, rest areas, etc.
- need to limit use
- passage through waters within the boundaries of State lands
- use of roads within the boundaries of State lands for access
- accommodations for volume of people using access points

### Canoe Livery

**Definition:** A facility providing services for hire relative to the use of the canoe runs in the Pinelands. Services include the rental of canoes and life jackets, parking and transportation to and from points of river access, the purchase of maps and limited supplies. There are seventeen (17) such facilities presently using the waters of the Pinelands.

**Applicable Zones:** High  
 Moderate  
 Low  
 Recreational Nodes

**Performance Criteria:** Although canoe liveries are permitted in the zone of Low Recreational Land Use Intensity, it is recommended that future facilities locate within nearby Recreational Nodes or existing towns and villages in order to concentrate similar high intensity uses in locations compatible with such development. Particular site design criteria and locations shall be governed by local Master Plans and Zoning Ordinances.

**Management:** Initial management action shall be concerned with the maintenance of the existing level of canoe livery operations in the Pinelands, including a permit requirement for the construction of any new facilities and expansion of existing facilities. A list of facilities and existing operating capacities is provided in Table H.1. This list identifies all canoe liveries presently con-

Privately Owned Canoe Rentals

<u>Name</u>	<u>Miles</u>	<u>No. Canoes</u>	<u>Other Vessels</u>
1. Mick's Canoe Rental	17	223	
2. Pine Barrens Canoe Rental	17	170	
3. Bel Haven Lake	35	300	
4. Mullica River Boat Basin	28	40	
5. Mullica River Marina	11	50	
6. Adam's Canoe Rental	19	80	
7. Pic-a-lillie Canoe Rental	19	73	
8. Paradise Lakes Campground	24	18	2 rowboats
9. Wading Pines Campground	17	30	
10. Pineland Canoes	12	36	6 kiyaks
11. Cedar Creek Campground	9	50	
12. Camp Alboronda	Only rent to their campers on own lake		
13. Winding River Campground	12	20	
14. Lenape Park Recreation Center	14	32	
15. Hack's Canoe Retreat	2.5	100	
16. Jones' Canoes	2.5	19	(out of study area)
17. Clark's Canoe Rental	5	25	(out of study area)

Table H .1

ducting operations within the Pinelands and the number of canoes, rowboats and kiyaks available for rent as of the summer of 1980.

Existing livery owners and operators shall be required to form a Canoe Livery Owners Association, whose principal function shall be the development and administration of an annual Canoe Livery Operations Management Plan for the continued use of Pinelands canoeing rivers. (The failure of any livery to join the Association will result in their recognition as 'unauthorized operators', and may result in the use of far-reaching management practices to control curtail their level of operations.) This Management Plan shall be subject to review and authorization by the Pinelands Commission on an annual basis. Failure to achieve authorization shall result in the 'authorized' continuance of the provisions of the Plan for the previous year. Authorization, however, must be achieved for the initial planning year.

The Annual Management Plan shall address, at a minimum, canoe allocations, by livery, to stretches of canoe runs in the different recreational land use intensity zones; livery expansions; proposals for new liveries and their assimilation into the Association and compliance with provisions of the Management Plan; any new river access points; and, other related maintenance and operations provisions. Most critically, the Plan shall address compliance with the performance requirements for canoeing and boating activities identified in the following four (4) sections.

**Economic Incentives and Cooperative Arrangements:** The State DEP, Division of Parks and Forestry, shall provide for facilities and access associated with allocation provisions of the 'authorized' plans, including both existing and future 'put-in' and 'take-out' locations, on public lands and within public rights-of-way. In addition, it shall aid in the provision of such facilities on private land when they are vital to the success of the plan and related canoeing river allocations.

The State shall also provide for riverside rest areas and other suitable use of State lands to aid in the success of various plan provisions. Further, the State shall refrain from the imposition of any fees, taxes or levies associated with the use of such facilities as long as the program provided for by the creation of a Canoe Livery Owners Association and requirement for the annual submission of a Plan continues as a successful tool for the management of use of the Pinelands canoeing waters. Finally, closed public roads shall be open for use by the canoe liveries if such use enhances compliance with the Plan.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendation set forth above. These recommendations shall be considered to address provisions to address compliance with use intensity discussed in the subsequent four (4) subsections on canoeing and boating.

1. The Commission should, as soon as possible, initiate formation of the Canoe Livery Owners Association working in conjunction with, at least, some of the larger or long established liveries.
2. The Commission, in conjunction with various appropriate State agencies, shall begin to develop an information base pertinent to the preparation of the Canoe Livery Operations Management Plan. Data of relevance may include, but is not limited to:

- a. existing volumes of traffic on canoe runs which are considered overcrowded
  - b. additional river segments which can be 'opened-up' for use
  - c. new access points which should be considered for immediate or long term future development
  - d. criteria for the development of a 'road use' program to control access to rivers and streams
  - e. methods of advertising and/or deemphasizing availability of certain stretches of river
  - f. suggestions for management alternatives which would bring use into compliance with the performance criteria associated with high and low intensity use of the rivers
  - g. conduct a survey to determine the percentage of canoe run use by the canoe liveries and the general public
  - h. investigate the use of a monitoring technique and systems to assure compliance with performance requirements for high and low intensity use of Pinelands waters
  - i. investigate the use of more stringent, perhaps punitive, management techniques which the Commission may suggest to be employed by the appropriate governmental agencies in order to insure attainment of performance requirements for high and low intensity use of Pinelands waters; particularly in the event that cooperation by the existing liveries is not forthcoming
  - j. investigate the need and potential location for accessory facilities to use of the waters of the Pinelands.
3. Conduct a study of the canoe livery industry to better understand rationale for opposing viewpoints to particular management techniques and develop alternatives.
  4. Support and seek funding for the implementation of physical improvements (launches, parking, road barriers, river maintenance, etc.) associated with recommended management of Pinelands waters and management programs requiring staffing and/or funding. It is recommended that the State provide all financing for the implementation of the Canoe Livery Operations Management Plan in turn for the cooperation and support for such programs by the canoe livery operators. Such cooperation and support shall include Plan Development and compliance and personnel assistance for monitoring and maintenance (limited).
  5. The Commission should make a staff commitment for assistance to the Canoe Livery Operators Association in the preparation of the first Annual Management Plan as it is likely that such a role will be necessary.
  6. Investigate as part of plan preparation the appropriateness of the performance requirements for use intensity suggested below and suggest minor revisions as necessary. Revisions shall not include recommendations much different than those made, herein, as that will defeat their intended purpose.
  7. The Commission shall seek the cooperation of various appropriate State agencies in the development of annual management plans, particularly the Green Acres Staff within the Department of Environmental Protection,

which it may include in its efforts relative to plan preparation and review. At a minimum the plans shall address and comply with the State Wild and Scenic Rivers Program.

8. The Commission should seek a role in the regulation of the canoe livery industry according to the principles of a given annual plan. Moreover, it should seek legislative power to require licenses for such operations in order to limit 'unauthorized' use and insure a fair competitive environment for Association members. Unlicensed 'unauthorized' operators would be forbidden from operating in areas where the State controls rights of access or waters transgress State lands.

#### Canoeing (river) - high intensity

Applicable Zones: High  
Moderate  
Low  
Recreational Node

Performance Requirements: Although permitted in the zone of Low Recreational Land Use Intensity, it is recommended that maximum canoeing - high intensity be confined to the Oswego and Wading Rivers. High intensity use of Pinelands canoeing rivers shall be subject to a maximum daily limit of forty (40) canoes per mile of canoeing river (between 'put-in' and 'take-out' points). This upper limit shall only apply to the Oswego and Wading Rivers. The North Branch Rancocas Creek shall be subject to a maximum limit of twenty-five (25) canoes per mile (between 'put-in' and 'take-out' points) per day. All other rivers, particularly the upper reaches of the Mullica River, the Great Egg Harbor River and Cedar Creek, should be programmed for a maximum capacity in keeping with the performance requirements for canoeing - low intensity, discussed in the following section.

Management: Management shall be according to the annual Canoe Livery Operations Management Plan, and shall address the temporal distribution of canoe traffic so as to spread out traffic volumes to the maximum extent practicable. In general, fifteen (15) canoes per mile at any one time should be considered maximum.

#### Canoeing (River) - low intensity

Applicable Zones: High  
Moderate  
Low  
Very Low  
Recreation Node

Performance Requirements: Low Intensity use of the canoeing rivers of the Pinelands shall be subject to a maximum daily limit of ten (10) canoes per mile of canoeing river (between 'put-in' and 'take-out' points).

Management: Management shall be in accordance with the annual Canoe Livery Operations Management Plan, and shall address a plan to temporally distribute canoe traffic so as to spread out traffic volumes to the maximum extent practicable. In general, two (2) canoes per mile at any one time should be considered maximum.

Boating/Canoeing (lake) - high intensity

Applicable Zones: High  
 Moderate  
 Low  
 Recreational Node

Performance Requirements: High intensity lake boating and/or canoeing in the Pinelands shall be defined according to a maximum use level of three (3) boats per acre of water surface.

Boating/Canoeing (lake) - low intensity

Applicable Zones: High  
 Moderate  
 Low  
 Very Low  
 Recreational Node

Performance Requirements: Low intensity lake boating and/or canoeing in the Pinelands shall be defined according to a maximum use level of one (1) boat per ten (10) acres of water surface.

Swimming

Goals: To increase and enhance the quality of swimming opportunity in the Pinelands particularly as they might also relate to the enjoyment of a natural setting, while not destroying the existing environmental quality of the recreational land use intensity zones.

Planning Concerns: The following is a listing of the issues which were taken into consideration in providing for swimming activity within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- relative popularity of the activity
- small number of existing facilities
- environmental context for facilities and their relationship to goals for the use zones
- relationship to other nearby recreational activity
- limited number of existing ponds and lakes which may provide the resource base for a facility v. the need to create new impoundments
- unauthorized swimming use of Pinelands waters; particularly canoeing rivers
- desirability or appropriateness of the creation of artificial pools
- potential for use of existing cranberry bogs or resource extraction areas
- need for support facilities

Swimming - high intensity

Applicable Zones: High  
 Moderate  
 Recreational Node  
 Bay

Performance Requirements: High intensity swimming shall be defined, at a maximum, as a swimming facility with a bathhouse(s), organized parking, food concession, adjacent boat livery and/or camping facilities. Atsion Lake is an example of such a facility within the Pinelands.

Swimming - low intensity

Applicable Zones: High  
Moderate  
Low  
Recreational Node  
Bay

Performance Requirements: Low intensity swimming in the applicable zones within the Pinelands shall be defined, at a maximum, as a swimming facility which satisfies the minimum requirements for such facilities according to prevailing State and/or local health, safety and/or building ordinances. Parking areas associated with such facilities shall be paved with porous materials and the overall design shall minimize, to the greatest extent practicable, any contrast between physical structures (including parking areas) and the existing natural environment.

Alternative Courses of Action: The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above. These recommendations shall be considered to address compliance with use intensity discussed in the two (2) subsections above.

1. The Commission should support or perform a user survey to determine the importance of participation in swimming at a natural-environment facility and setting v. a man-made one, and the desirability or demand for certain support facilities.
2. The Commission should participate in a study to identify potential resources which may be used for such facilities and engage in the establishment of priorities for future development.
3. Support the performance of a survey to determine demand for facilities within the Pinelands.
4. Explore the need for programs to make such facilities more accessible to innercity residents (busing, cooperative programs with day camps, locations in close proximity to Atlantic City, Camden/Philadelphia or Trenton).
5. Encourage the development of lake and pool swimming facilities at private recreation areas (e.g. campgrounds, housing developments) and county or municipal parks.
6. Encourage the acquisition and or conversion of abandoned cranberry bogs and resource extraction sites for swimming facilities, particularly in areas of logistical significance which satisfy locational criteria for the development of appropriate facilities.
7. Support funding and staffing assignments within the Department of Environmental Protection for surveillance personnel to enforce regulations governing illegal swimming activity in the Pinelands.



8. Support the provision of future swimming facilities only when they are considered consistent with the provisions of the State Wild and Scenic Rivers Program.
9. Develop planning and design criteria to be used in creating facilities of relative intensities.

### Picnicking

---

**Goals:** To increase the opportunities for picnicking use of the Pinelands in a way which allows for an appreciation of the natural environment and minimizes conflicts with other recreational activities or the objectives for use and environmental context within the different use intensity zones.

**Planning Concerns:** The following is a listing of the issues which were taken into consideration in providing for picnicking activity within the various use intensity zones, and in the determination of appropriate performance requirements, management techniques and incentive programs.

- compatibility between developed picnic areas and the very low recreational land use intensity zone
- environmental degradation of sites in general, and litter specifically
- compatibility with other nearby land uses and recreational activity
- level of support facilities needed (e.g. sanitary, etc.)

### Picnicking

**Applicable Zones:** High  
 Moderate  
 Low  
 Very Low  
 Recreational Node  
 Bay

**Performance Requirements:** Picnicking within the Very Low Recreational Land Use Intensity Zone shall be confined to roadside areas (i.e. within 300 feet of the centerline of a road). In the Low Recreational Land Use Intensity Zone a spacing of 100 feet between tables shall be provided. In all other zones maximum densities shall be eight (8) tables per acre for family picnicking areas and sixteen (16) tables per acre for organized groups. Parking areas shall be provided at a rate of one space per table and sanitation facilities at a rate of one (1) facility per picnicking area.

**Alternative Courses of Action:** The following is a list of possible future actions by the Pinelands Commission to effect the implementation of the standards and policy recommendations set forth above.

1. Promote the development of roadside picnic areas along highways, particularly in the Very Low Intensity Zone.
2. Encourage picnic area development in conjunction with other, perhaps high intensity, use areas (e.g. swimming, camping, boat launches).
3. Support the allocation and funding of necessary staff to conduct surveillance and enforcement of existing rules and regulations.
4. Conduct a survey of picnickers to determine the desirability and or need for support facilities.

## **APPENDIX I: BIBLIOGRAPHY**

Atwill, Lionel A., "Outlaws in the Pines," reprinted from Backpacker, April-May 1978.

Batsto Citizens Committee, "Batsto Citizens Gazette," Special Atsion Edition, Spring and Summer, 1979.

Beechel, Jacque, "Interpretation for Handicapped Persons," July 1975.

Berger, Jonathan, "Planning the Use and Management of the Pinelands: An Historical, Cultural and Ecological Perspective," prepared for the New Jersey Pinelands Commission, February 15, 1980.

Betz, Converse and Murdock, Inc.,

"Summary of Pinelands Surface Water Quantity," prepared for the New Jersey Pinelands Commission, May 1980.

"Surface Water Quality," Technical Memoranda SW IV-1 - SW IV-7, prepared for the New Jersey Pinelands Commission, February 1980.

"Surface Water Quantity," Summary of Technical Memoranda SW I - SW III-2, prepared for the New Jersey Pinelands Commission, February 1980.

"Surface Water Quantity," Technical Memoranda SW I - SW III-2, prepared for the New Jersey Pinelands Commission, February 1980.

"Summary of Pinelands Groundwater Hydrology," prepared for the New Jersey Pinelands Commission, May 1980.

Branchers, D.M., "Critique of K.D. Fines: 'Landscape Evaluation; A Research Project in East Sussex,'" Regional Studies, Volume 3, No. 4, December 1972.

Brigantine Planning Board, "Master Plan, City of Brigantine,".

Brown, K.W. and Associates, "An Assessment of the Impact of Septic Leach Fields, Home Lawn Fertilization, and Agricultural Activities on Ground Water Quality," prepared for the New Jersey Pinelands Commission, draft, February 15, 1980.

Caiazza, N. and D. Fairbrothers, "Threatened and Endangered Vascular Plant Species of the New Jersey Pinelands and Their Habitats," prepared for the New Jersey Pinelands Commission, 1980.

Calvin, James S., and John A. Dearinger, and Mary Ellen Curtin, "An Attempt at Assessing Preferences for Natural Landscapes," Environment and Behavior, Volume 4, No. 4, December 1972.

Cawley, James and Margaret, Exploring the Little Rivers of New Jersey, Rutgers University Press: New Brunswick, New Jersey, 1971.

Center for Coastal and Environmental Studies, Rutgers University,  
"Coastal Zone Legislation," Coastal Notes No. R-1, September 1976.

"New Jersey's Fishing Industry," Coastal Notes No. R-4, May 1977.

"State Government and Coastal Zone Management," Coastal Notes No. R-2, January 1977.

Sources: Legal Documents, Magazines, Master Plans, Papers, Periodicals, Reports

Academy of Natural Sciences of Philadelphia, "A Study of Significance of the Pine Barrens of New Jersey," prepared for the National Park Service, U.S. Department of the Interior, December 1967.

Adams, Rehmann and Heggan Associates, "Washington Township Master Plan," Burlington County, New Jersey, July, 1978.

Adams, Robert L. and Robert C. Lewis and Bruce H. Drake, "Outdoor Recreation, A Legacy for America," reprinted from Appendix 'A', An Economic Analysis, U. S. Department of the Interior, December 1973.

Adirondack Park Agency,  
"Adirondack Park Land Use and Development Plan".

"Adirondack Park State Land Master Plan," June 1, 1972.

Alan Mallach Associates,  
"Land Market and Land Development Trends in the Pineland," prepared for the Pinelands Commission, January 1980.

"Municipal Zoning and Master Plan Study Report, Atlantic County Housing Strategy," 1980.

"Population Trends and Demand Pressures in the Pinelands," draft prepared for the Pinelands Commission, January 1980.

"Population Trends and Demand Pressures in the Pinelands," (final), 1980.

Alvin E. Gershen Associates,  
"Background Studies and Development Plan, April 1974, Dennis Township".

"Background Studies," prepared for Wrightstown Borough, Burlington County, New Jersey, January 1974.

"Development Plan and Background Studies, Upper Township, Cape May County, New Jersey," July 1975.

"Master Plan Report and Summary of Proposals, Town of Hammonton, Atlantic County, New Jersey," 1966.

"Summary of Background Studies and Development Plan," for Wrightstown Borough, Burlington County, New Jersey, January 1974.

Andropogon Associates, "Forest Vegetation of the Pinelands," prepared for the New Jersey Pinelands Commission, February 1980.

Atlantic Electric,  
"1979 Community Profiles".

"1980 Community Profiles".

Atwill, Lionel A., "Outlaws in the Pines," reprinted from Backpacker, April-May 1978.

Batsto Citizens Committee, "Batsto Citizens Gazette," Special Atsion Edition, Spring and Summer, 1979.

Beechel, Jacque, "Interpretation for Handicapped Persons," July 1975.

Berger, Jonathan, "Planning the Use and Management of the Pinelands: An Historical, Cultural and Ecological Perspective," prepared for the New Jersey Pinelands Commission, February 15, 1980.

Betz, Converse and Murdock, Inc.,

"Summary of Pinelands Surface Water Quantity," prepared for the New Jersey Pinelands Commission, May 1980.

"Surface Water Quality," Technical Memoranda SW IV-1 - SW IV-7, prepared for the New Jersey Pinelands Commission, February 1980.

"Surface Water Quantity," Summary of Technical Memoranda SW I - SW III-2, prepared for the New Jersey Pinelands Commission, February 1980.

"Surface Water Quantity," Technical Memoranda SW I - SW III-2, prepared for the New Jersey Pinelands Commission, February 1980.

"Summary of Pinelands Groundwater Hydrology," prepared for the New Jersey Pinelands Commission, May 1980.

Branchers, D.M., "Critique of K.D. Fines: 'Landscape Evaluation; A Research Project in East Sussex,'" Regional Studies, Volume 3, No. 4, December 1972.

Brigantine Planning Board, "Master Plan, City of Brigantine,".

Brown, K.W. and Associates, "An Assessment of the Impact of Septic Leach Fields, Home Lawn Fertilization, and Agricultural Activities on Ground Water Quality," prepared for the New Jersey Pinelands Commission, draft, February 15, 1980.

Caiazza, N. and D. Fairbrothers, "Threatened and Endangered Vascular Plant Species of the New Jersey Pinelands and Their Habitats," prepared for the New Jersey Pinelands Commission, 1980.

Calvin, James S., and John A. Dearing, and Mary Ellen Curtin, "An Attempt at Assessing Preferences for Natural Landscapes," Environment and Behavior, Volume 4, No. 4, December 1972.

Cawley, James and Margaret, Exploring the Little Rivers of New Jersey, Rutgers University Press: New Brunswick, New Jersey, 1971.

Center for Coastal and Environmental Studies, Rutgers University,

"Coastal Zone Legislation," Coastal Notes No. R-1, September 1976.

"New Jersey's Fishing Industry," Coastal Notes No. R-4, May 1977.

"State Government and Coastal Zone Management," Coastal Notes No. R-2, January 1977.

Charles H. Macke and Associates, "Master Plan, Township of Barnegat, Ocean County, New Jersey," November 1973.

Chesilhurst Planning Board, "Master Plan - 1979," February 1979.

Chubb, Michael and Eric H. Bauman, "Assessing the Recreation Potential of Rivers," Volume 32-No. 2, Journal of Soil and Water Conservation, March-April 1977.

Citizens Advisory Committee on Recreation and Natural Beauty, "Annual Report to the President and the President's Council on Recreation and Natural Beauty," Washington, D.C., 1968.

Clawson, Marion and Jack L. Knetsch, Economics of Outdoor Recreation, The Johns Hopkins University Press: Baltimore, Maryland, 1975.

Coastal Plains Environmental Consultants and R. E. Hughey Associates, "Hamilton Township Master Plan, Volume 3, Environmental Base," 1978.

Committee on Assessment of Demand for Outdoor Recreation Resources, National Academy of Science, Assessing Demand for Outdoor Recreation, prepared for the Bureau of Outdoor Recreation, U. S. Department of the Interior, 1975.

Community Housing and Planning Associates, Inc.,  
"Land Use Plan, Master Plan Element for Egg Harbor City, New Jersey,"  
October 1978.

"Swamp and Forest Recreation Study, Egg Harbor City, New Jersey".

"An Environmental Resource Inventory of the Township of Barnegat, Ocean County, New Jersey," September 1978.

"An Environmental Resource Inventory of the Township of Easthampton, Burlington County, New Jersey," May 1979.

"An Environmental Resource Inventory of the Township of Tabernacle, Burlington County, New Jersey," August 1979.

"Bulltown and Friendship Bogs, Non-Public Lands Within Wharton State Forest,"  
August 1976.

"The West Plains and Oswego River Extension Tracts of the New Jersey Pinelands," August 1974.

Corbin City, New Jersey, "1978 Master Plan of Corbin City".

Coughlin, Robert E. and Karen A. Goldstein, "The Extent of Agreement Among Observers on Environmental Attractiveness," RSRI Discussion Paper Series, No. 37, Regional Science Research Institute: Philadelphia, Pa., February 1970.

County of Atlantic, "Projected Major Land Uses for Atlantic County, New Jersey - 1977-2000," December 1978.

County of Atlantic, Division of Planning,

"Atlantic County Growth Trends Report," Growth Trends Monitoring Project, November 1, 1978.

"Bikeway Element," Highway and Bridge Section, Atlantic County's Capital Development Program, 1978-1984, September 1979.

"Coastal Zone Management and Atlantic County," January 1979.

"Population Report for Atlantic County, New Jersey," November 1978.

"Recreation and Parks Section," Atlantic County's Capital Development Program, 1978-1984, November 1978.

County of Burlington, Cultural and Heritage Commission, "Burlington County Inventory and Survey of Historic, Architectural, and Cultural Resources," Volumes 1, 2, 3, 4, 1975-1977.

County of Burlington, Planning Board,

"Natural Features in Burlington County," February 1973.

"Recreation and Open Space, A Reconnaissance Study," Report No. 4 of the Comprehensive Plan.

County of Camden, Planning Department,

"Community Facilities and Services," draft of Lower County Planning District Development Guide, Master Plan Program, Phase 1, 1979.

"Comprehensive Plan," 1972.

"Conservation and Recreation in Camden County (Phase 1)," December 1963.

"Economic Base," draft of Lower County Planning District Development Guide, Master Plan Program, October 1978.

"Financial Analyses," draft of Lower County Planning District Development Guide, Master Plan Program, August 1978.

"Financial Position," paper, Camden County Lower Planning District.

"History," draft of Lower County Planning District Development Guide, Master Plan Program, Phase 1, 1979.

"Housing," draft of Lower County Planning District Development Guide, Master Plan Program, April 1979.

"Land Use," draft of Lower County Planning District Development Guide, Master Plan Program, Phase 1, 1979.

"Land Use Element," Element 104, June 15, 1976.

"Population," draft of Lower County Planning District Development Guide, Master Plan Program, Phase 1, 1979.

"Regional and Natural Setting," draft of Lower County Planning District Development Guide, Master Plan Program, June 1977.

"Soil Analyses," draft of Lower County Planning District Development Guide, Master Plan Program, Phase I, 1979.

"Transportation," draft of Lower County Planning District Development Guide, Master Plan Program, December 1978.

County of Cape May, Planning Board,

"Cape May County Comprehensive Plan, " 1978.

"Historic Sites Inventory, Cape May County, New Jersey," April 1977.

"Inlets and Beaches, Cape May County," March 1977.

"Open Space and Recreation Plan," August 1975.

"Population Characteristics of Cape May County, New Jersey".

"The Resort Economy of Cape May County, New Jersey, 1974 Update," August 1975.

"Woodbine Borough, Background Studies and Master Plan," October 1975.

County of Cumberland, Planning Board,

"Existing Land Use of Cumberland County," July 1979.

"Generalized Future Land Use," March 1972.

"Land Use, Existing Patterns and Environmental Characteristics, Maurice River Township, Cumberland County, New Jersey," December 1976.

"Land Use - 1964 for Cumberland County, New Jersey," October 1965.

"Open Space and Recreation for Cumberland County, New Jersey," June 1966.

"Open Space - How to Have It and Hold It; A Guide to Preservation, Acquisition and Defense," May 1974.

"Special Studies for Cumberland County, New Jersey," July 1966.

"Urbanization - Cumberland County, New Jersey," May 1971.

County of Gloucester, Planning Department,

"Gloucester County, Land Use Update, 1975 - The Use of Land, Volume II," April 1978.

"Natural Resources Planning Study," June 1977.

"Open Space in Gloucester County," February 1976.

"Pinelands Preliminary Draft Report Comments," April 17, 1980.



"The Use of Land in Gloucester County," Volume 1, Land Use and Environmental Management Program, May 1975.

County of Ocean, Department of Parks and Recreation, "Spring and Summer 1980 Recreation Perspectives," 1980.

County of Ocean, Office of Public Information,  
"Connors Petitions Governor Byrne for Assistance to Tourism Industry,"  
News Release.

"History of Tuckerton," News Release, April 23, 1980.

"Mayors and Clerks, Ocean County Municipalities, 1980," News Release.

"Toms River Yacht Club History," News Release, September 1979.

"Ocean County Concept Plan," November 1975.

Cumming, James A., "Prescribed Burning on Recreation Areas in New Jersey: History, Objectives, Influence, and Technique," reprinted from Proceedings, Annual Tall Timbers Fire Ecology Conference, April 10-11, 1969.

DSI Environmental Engineers, "An Assessment of Innovative and Alternative Technologies for On-Site Wastewater Disposal," prepared for the New Jersey Pinelands Commission, draft, February 15, 1980.

Dean, Johnathan with Grace L. Singer, "Open Space Preservation in the New Jersey Pinelands," prepared for the U.S. Department of Agriculture, March 1979.

Delaware Valley Regional Planning Committee,  
"Bicycle Mobility Study," Draft Report, October 1979.

"Summary of the 208 Water Quality Management Plan," October 1979.

Drawbaugh, Charles C. and Roger R. Locaudro, "The Effects of the New Jersey Hunter Education Program and Selected Demographic Variables of Students on Knowledge and Attitude Scores about the Sport of Hunting," final research report, June 1978.

Eagleton Poll, The Eagleton Institute of Politics,  
"New Jerseyans' Vacations: A Statewide Survey," Volume 1: Report and Questionnaire, prepared for Ocean County Tourism Advisory Council, January 1979.

"Summer Tourism and Travel in New Jersey," Volume 1: A Report on One-Day Visitors at Tourist Attractions, prepared for New Jersey Department of Labor and Industry, Division of Travel and Tourism, March 31, 1980.

"Summer Tourism and Travel in New Jersey," Volume 2: A Report on Travelers Staying Overnight, March 31, 1980.

East Coast Enduro Association, "Organized Enduro Activity in the Pinelands".

- Economics Research Associates, "Evaluation of Public Willingness to Pay User Charges for Use of Outdoor Recreation Areas and Facilities," prepared for the Bureau of Outdoor Recreation, U.S. Department of the Interior, September 1, 1976.
- Edwards and Kelsey, Inc.,  
 "New Jersey Comprehensive Outdoor Recreation Plan, Summary Report," 1967.  
 "Open Space Plan and Program," May 1972.
- Environmental Assessment Council, Inc., "Natural Resource Inventory, Lower Camden County," prepared for Camden County Environmental Agency, 1977.
- Environmental Assessment Council, Inc., "Recreation and Open Space Facilities, Lower Camden County Natural Resource Inventory," prepared for Camden County Environmental Agency.
- Esposito, Frank J., Travelling in New Jersey, William H. Wise and Co., Inc.: Union City, New Jersey, 1978.
- Estell Manor Planning Board, "Revised Master Plan, City of Estell Manor," prepared for the City of Estell Manor, December 1977.
- Fabos, Julius Gy and Stephanie J. Caswell, "Composite Landscape Assessment: Assessment Procedures for Special Resources, Hazards and Development Suitability; Part II of the Metropolitan Landscape Planning Model (METLAND)," Massachusetts Agricultural Experiment Station Publication, Research Bulletin No. 637, University of Massachusetts, College of Food and Natural Resources: Amherst, Massachusetts, January 1977.
- Fines, K.D., "Landscape Evaluation: A Research Project in East Sussex," Regional Studies, Volume 2, No. 1, September 1968.
- Folsom Borough, "Recreation and Community Facility Element of the Folsom Master Plan".
- Forman, Richard T.T., Pine Barrens: Ecosystem and Landscape, Academic Press: New York, 1979.
- Galvin, Nancy, "Survey of the Recreational User in the Pinelands," May 15, 1980.
- Gersher and Coppola Associates, "Zoning Ordinance No. 7, Township of Upper, Cape May County, New Jersey," adopted December 6, 1976.
- Gloucester County College and Alvin E. Gershen Associates, "The New Jersey Municipal Land Use Law - A Series of Monographs," New Jersey Institute for Continuing Legal Education: Neward, New Jersey, June 1976.
- Goldshore, Lewis P., Esq., "The New Jersey Riparian Rights Handbook," prepared for the New Jersey County and Municipal Government Study Committee, November 1979.
- Gross, Cheryl, "The Needs of the Recreationally Disadvantaged," draft prepared for the New Jersey Statewide Comprehensive Outdoor Recreation Plan (SCORP).

- Guttman, Howard M., 'The Legend of the Jersey Devil,' The Crossroads, Volume X, No. 4, The New Jersey Historical Society: Newark, New Jersey, 1973.
- Hammonton, County of Atlantic, New Jersey, 'Zoning, Chapter 162, Ordinance No. 11-1979,' General Code Publishing Corporation: Spencerport, N.Y., 1980.
- Harper, David P., 'Atlas of Aerial Photography and Satellite Imagery,' February 1977.
- Hillman, Robert J. and Keith R. Lockwood and Thomas W. McCloy, 'Fishery Resources and Potential of the Pinelands National Reserve,' January 14, 1980.
- Holland, John J., 'Weymouth Township Comprehensive Plan,' prepared for Weymouth Township Planning Board.
- Hughes, Joseph R., 'Development in the Pine Barrens: A Design for Disaster,' 1979.
- Institute for Environmental Studies, Rutgers University, 'A Guide to the Environmental Aspects of the Local Planning Process,' September 1976.
- Ittner, Ruth and Dale R. Potter and James K. Agee and Susie Anschell, 'Recreational Impact on Wildlands, Conference Proceedings,' U.S. Forest Service No. R-6-001-1979.
- Jacobs, Peter and Douglas Way, 'Visual Analysis of Landscape Development,' Harvard University, Graduate School of Design: Cambridge, Massachusetts, 1969.
- John G. Reutter Associates and West Jersey Planning Associates, 'Borough of Berlin Master Plan - 1978'.
- 'Township of Berlin Master Plan - 1979'.
- Kaplan, Rachel, 'Predictors of Environmental Preference: Designers and Clients,' reprint from Preiser, W.F.E., Ed., Environmental Design Research, Powden, Hutchinson and Ross: Stroudsburg, Pa., 1973.
- Kaplan, Stephen and Rachel Kaplan and John S. Wendt, 'Rated Preference and Complexity for Natural and Urban Visual Material,' Perception and Psychophysics, Volume 12 (4), Psychonomic Society, Inc.: Austin, Texas, 1972.
- Kaplan, Stephen and John S. Wendt, 'Preference and the Visual Environment: Complexity and Some Alternatives,' reprint from Mitchel, W.J., Ed., Environmental Design: Research and Practice, Proceedings of the Environmental Design Research Association, Conference Three, 1972.
- Karabashian, Peter R., 'Planning Reports,' Mullica Township Master Plan.
- Land Design, Inc. and Wills, Anderson and Lord, 'Shamong Master Plan Program,' Shamong Township, Burlington County, New Jersey, August, 1975.

Leopold, Luna B., "Landscape Esthetics: How to Quantify the Scenics of a River Valley," Natural History, Volume 1, No. 3, 1969.

Leshner, William G., "Land Use Legislation in the Northeast: New Jersey," September 1975.

Lime, David W.,

"Behavioral Research in Outdoor Recreation Management: An Example of How Visitors Select Campgrounds," reprint (no source).

"When the Wilderness Gets Crowded," reprint from Naturalist.

"Wilderness Use and Users: A Summary of Research".

Lime, David W. and George H. Stankey, "Carrying Capacity: Maintaining Outdoor Recreation Quality," reprint from Recreation Symposium Proceedings, USDA Forest Service, 1971.

Lime, David W. and Robert C. Lucas, "Good Information Improves the Wilderness Experience," reprint from Naturalist, Winter 1977.

Lime, David W. and Roland G. Buchman, "Putting Wilderness Permit Information to Work," reprint from Journal of Forestry.

Little, Silas, "Wildflowers of the Pine Barrens and Their Niche Requirements," reprint from New Jersey Outdoors.

Little, S. and H.S. Somes, "Prescribed Burning in the Pine Regions of Southern New Jersey and Eastern Shore Maryland - A Summary of Present Knowledge," Northeastern Forest Experiment Station Paper No. 151, 1961.

Marcin, Thomas C. and David W. Lime, "Our Changing Population Structure: What Will It Mean for Future Outdoor Recreation Use?" reprint (no source).

Maturi, Donna G., "Current Threats to Open Space in the Adirondack Park: Private Forest Lands and the Real Property Tax," The Adirondack Council, August 31, 1979.

Meridian Engineering, Inc.,

"Plan for the Pinelands," prepared for the Pinelands Environmental Council, adopted 1975.

"Supplement to Plan for the Pinelands," prepared for the Pinelands Environmental Council.

Meyer, Joan and Bill, Canoe Trails of the Jersey Shore, Specialty Press, Inc.: Ocean, New Jersey, 1974.

Mid-Atlantic Camper, South Jersey Edition, Volume 8, No. 1, May 16, 1980.

Mole, Michaela M., Away We Go!, Rutgers University Press, New Brunswick, New Jersey, 1976.

McCormick, Jack and Leslie Jones, "The Pine Barrens Vegetation Geography," Research Report No. 3, New Jersey State Museum: Trenton, N.J., January 1973.

McPhee, John, The Pine Barrens, Farrar, Straus and Geroux: New York, 1979.

Nash, Roderick, Wilderness and the American Mind, Yale University: New Haven, 1973.

New England Natural Resources Center, "Little Egg Harbor, New Jersey, A Non-Profit Organization, The U.S. Government and An Insurance Company Rescue a Marsh," Case No. 5, Case Studies in Land Conservation, January 26, 1976.

New Jersey Administrative Code, Title 7, Chapter 7E, "Office of Administrative Law: Trenton, New Jersey, July 19, 1979.

New Jersey Assembly, Assembly No. 1992, "New Jersey Wild and Scenic Rivers Act," Introduced May 27, 1976.

New Jersey Department of Conservation and Economic Development, "State Park Visitor Use Survey, 1966-1967," A Supplement to the New Jersey Comprehensive Outdoor Recreation Plan, June 1968.

New Jersey Department of Conservation and Economic Development, Bureau of Recreation, "Surfing and Water Skiing in New Jersey".

New Jersey Department of Conservation and Economic Development, Division of Fish and Game, Bureau of Wildlife Management, "What Is Hunting Worth in New Jersey?"

New Jersey Department of Conservation and Economic Development, Division of State and Regional Planning, "Parks and Recreational Land Use in New Jersey," June 1965.

New Jersey Department of Environmental Protection, "Amendments to Rules and Regulations Under Coastal Area Facility Review Act," Docket No. DEP 047-78110, March 2, 1979.

"Guidelines for the Classification, Study and Planning of Rivers for Designation to the New Jersey Wild and Scenic Rivers System," adopted June 5, 1979.

"New Jersey Coastal Area Facility Review Act," Chapter 185, Laws of 1973.

"New Jersey Outdoors," January-February 1974.

"New Jersey Outdoors," March-April 1974.

"New Jersey Outdoors," May-June 1974.

"New Jersey Outdoors," March-April 1975.

"New Jersey Outdoors," September-October 1975.

"New Jersey Outdoors," March-April 1976.

"New Jersey Outdoors," May-June 1976.

"New Jersey Outdoors," September-October 1976.

"New Jersey Outdoors," May-June 1977.

"New Jersey Outdoors," September-October 1977.

"New Jersey Outdoors," November-December 1977.

"New Jersey Outdoors," March-April 1978.

"New Jersey Outdoors," May-June 1978.

"New Jersey Outdoors," November-December 1978.

"New Jersey Outdoors," January-February 1979.

"New Jersey Outdoors," May-June 1979.

"New Jersey Outdoors," July-August 1979.

"New Jersey Outdoors," September-October 1979.

"New Jersey Outdoors," November-December 1979.

"New Jersey Outdoors," March-April 1980.

"1973 Spruce Run Recreation Study," A Supplemental Study to the New Jersey Statewide Comprehensive Outdoor Recreation Plan.

"Rules and Regulations Under Coastal Area Facility Review Act," Docket No. DEP 005-76-03, April 1, 1977.

"State Quail Farm," reprint from New Jersey Outdoors.

"The Forked River State Game Farm," reprint from New Jersey Outdoors.

"Trails in New Jersey, An Inventory as of 1970," Monograph No. 1, A Supplemental Study to the New Jersey Statewide Comprehensive Outdoor Recreation Plan.

New Jersey Department of Environmental Protection, Division of Fish, Game and Shellfisheries,

"Annual Report," 1978.

"Annual Report," 1979.

"Guide to Wildlife Management Areas".

"New Jersey's Bay Shellfisheries".

"New Jersey's White-tailed Deer," Report No. 1, 1973-74.

"New Jersey's White-tailed Deer," Report No. 2, 1974-75.

"New Jersey's White-tailed Deer," Report No. 3, 1975-76.

"New Jersey's White-tailed Deer," Report No. 4, 1976-77.

"New Jersey's White-tailed Deer," Report No. 5, 1977-78.

"New Jersey's White-tailed Deer," Report No. 6, 1978-79.

New Jersey Department of Environmental Protection, Division of Fish, Game and Wildlife, "An Assessment of the Game Mammals and Birds and Small Mammals of the Pinelands," prepared for the New Jersey Pinelands Commission, 1980.

New Jersey Department of Environmental Protection, Division of Marine Services, "A Method for Coastal Resource Management," a staff report, July 1978.

"Interior Land Use and Density Guidelines for the Coastal Area of New Jersey," May 1976.

"Options for New Jersey's Developed Coast," March 1979.

New Jersey Department of Environmental Protection, Division of Marine Services, Coastal Zone Management Program, "An Inventory of the New Jersey Coastal Areas," September 19, 1975.

"Estuarine and Wetland Resources: A Staff Working Paper," January 1977.

"Nominated Areas of Public Concern in the New Jersey Coastal Zone: A Staff Report," December 1977.

New Jersey Department of Environmental Protection, Division of Marine Services, Division of Coastal Resources, "Coastal Development Potential Study," Rogers and Golden: Philadelphia, Pa., September 1979.

New Jersey Department of Environmental Protection, Division of Marine Services, Office of Coastal Zone Management, "Transportation and the Coast: A Staff Working Paper," January 1977.

"Upland Wildlife Habitats: Upland Living Resources: A Staff Working Paper," November 1976.

New Jersey Department of Environmental Protection, Division of Marine Services, Division of Coastal Resources, Bureau of Coastal Planning and Development and U. S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Coastal Zone Management, "Proposed New Jersey Coastal Management Program and Draft Environmental Impact Statement," May 1980.

New Jersey Department of Environmental Protection, Division of Marine Services, Office of Coastal Zone Management and U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Coastal Zone Management, "New Jersey Coastal Management Program, Bay and Ocean Shore Segment and Final Environmental Impact Statement," August 1978.

New Jersey Department of Environmental Protection, Division of Parks and Forestry, "History of Island Beach," November 1977.

New Jersey Department of Environmental Protection, Division of Parks and Forestry, Bureau of Forest Fire Management, "Fire Management Plan," prepared for the New Jersey Pinelands Commission, draft, January 1979.

New Jersey Department of Environmental Protection, Division of Parks and Forests, Bureau of Forestry, "New Jersey Pinelands Forestry Report," prepared for the Governor's Pinelands Review Committee, March 30, 1978.

New Jersey Department of Environmental Protection, Division of Parks, Forestry, and Recreation, Bureau of Parks, "New Jersey State Park Visitor Use Study, 1966-1967," A Supplement to the Technical Report, June 1968.

"Proceedings - New Jersey Trail Conference," March 7, 1973.

"History of Island Beach," November 1974.

New Jersey Department of Environmental Protection, Division of Water Resources, Bureau of Water Quality, "Lakes Management Program - A Statewide Lake Inventory," September 1978.

New Jersey Department of Environmental Protection, Green Acres Program, "Green Acres, Procedural Guide, Local Assistance Program".

"Green Acres Tax Exemption Program, Area Location Listing".

"New Jersey Pine Barrens: Environmental Assessment for Specific Parcels Located in the Area of the West (High) Plains".

"Original Work Plan for New Jersey Heritage Program, 1979," and personal correspondence, May 12, 1980.

"Statewide Comprehensive Outdoor Recreation Plan, 1977".

"The Natural Areas System - A Planning Update, 1978".

New Jersey Department of Environmental Protection, Office of the Commissioner, "Rules and Regulations Concerning Natural Areas and the Natural Areas System," Docket No. DEP 065-77-12, July 13, 1978.

New Jersey Department of Environmental Protection, Office of the Commissioner, Office of Environmental Review, "Outdoor Recreation in New Jersey, 1973," New Jersey Statewide Comprehensive Outdoor Recreation Plan.

New Jersey Department of Health, "New Jersey State Sanitary Code, Chapter XI, Campgrounds," September 1, 1968.

New Jersey Department of Labor and Industry, Division of Travel and Tourism, "Master Plan," February 1, 1980.

New Jersey Department of Transportation, "New Jersey Official Highway Map and Guide," 1978.

New Jersey Governor's Pineland Review Committee, "Planning and Management of the New Jersey Pinelands," February 1979.



New Jersey Pinelands Commission,

"Answers to Questions About Development and Public Land Acquisition in the New Jersey Pinelands," November 1979.

"Interim Rules and Regulations for Review and Approval of Applications for Development or Construction Under the Pinelands Protection Act," July 27, 1979.

"New Jersey Pinelands Draft Comprehensive Management Plan," Volumes I and II, including Plates 1 - 28, June 1980.

"New Jersey Pinelands Preservation Area Comprehensive Management Plan, August 8, 1980.

"Pinelands National Reserve Work Plan for Comprehensive Management Plan," November 1979.

"Goals and Policies," March 28, 1980.

New Jersey Senate, Senate No. 3091, 1979, "Pinelands Protection Act," repealing P.L. 1971, c.417, introduced February 13, 1979.

New Jersey Travel and Resort Association, "Tourism News," Vol. 1, No. 1, March 1980.

New York Times, "Coastal Zone Plan Being Drawn," and map, September 9, 1979.

New York Times, "Help the States Rescue the Shorelines," August 30, 1979.

Nez, George and Richard Walsh,

"Cost-Effectiveness," draft April 8, 1980.

"V - The Capacity and Volume Factor in Cost Effectiveness Analysis," prepared for National Park Service, Denver Service Center, draft April 8, 1980.

Nixdorf, Bert, Hikes and Bike Rides for the Delaware Valley and Southern New Jersey...with Emphasis on the Pine Barrens, 1976.

Olin, Peter J. and Terrence J. Boyle, "Vermont Scenery Classification and Analysis," prepared for the Vermont State Planning Office.

Patterson, George L., "The Computer Takes a Canoe Trip," reprint from Naturalist Winter 1977.

Peterson, George L. and Edward S. Neumann, "Modeling and Predicting Human Response to the Visual Recreation Environment," Journal of Leisure Research, Volume 1, No. 3, summer 1969.

Port Republic Planning Board, "Port Republic Master Plan".

Priddle, George B. and Cameron D. Clark and Larry A. Douglas, "The Behavioral Carrying Capacity of Primitive Areas for Wilderness Travel".

R.E. Hughey Associates and Coastal Plains Environmental Consultant, "Hamilton Township Master Plan, Volume 1, Base Studies," 1978.

R. W. Booker and Associates, Inc.,

"New Jersey Outdoor Recreation Demand Study, Volume 1 - Study Report," prepared as an element of New Jersey's Statewide Comprehensive Outdoor Recreation Plan for the Green Acres Program, November 1976.

"New Jersey Outdoor Recreation Demand Study, Volume 2 - Detailed Tabulation Table," prepared as an element of New Jersey's Statewide Comprehensive Outdoor Recreation Plan for the Green Acres Program, November 1976.

"New Jersey Outdoor Recreation Demand Study, Volume 3 - Detailed Projection Data: Out-of-State," prepared as an element of New Jersey's Statewide Comprehensive Outdoor Recreation Plan for the Green Acres Program, November 1976.

"New Jersey Outdoor Recreation Demand Study, Volume 4a - Detailed Projection Data: In-State," prepared as an element of New Jersey's Statewide Comprehensive Outdoor Recreation Plan for the Green Acres Program, November 1976.

"New Jersey Outdoor Recreation Demand Study, Volume 4b - Detailed Projection Data: In-State (cont'd)," prepared as an element of New Jersey's Statewide Comprehensive Outdoor Recreation Plan for the Green Acres Program, November 1976.

Rabinowitz, Carla B. and Robert E. Coughlin, "Analysis of Landscape Characteristics Relevant to Preference," RSRI Discussion Paper Series: No. 38, March 1970.

Ragan, Stein Associates,

"Borough of Medford Lakes Master Plan".

"Comprehensive Master Plan, Evesham Township," 1980.

"Evesham Township Comprehensive Master Plan," December 1978.

"The Stokes Road Commercial District, Guidelines to Development," 1979.

Research, Planning and Design Associates, Inc., "Appendix N. Visual and Cultural Environment;" North Atlantic Regional Water Resources Study, prepared for the North Regional Water Resources Study Coordinating Committee, May 1972.

Robichaud, Beryl, "A Report to the Pinelands Commission," Rutgers University, prepared for the Pinelands Commission, March 6, 1980.

Rogers and Golden, "Summary of Recommendations from Natural Resource Consultants," prepared for the Pinelands Commission, January 28, 1980.

Rogers, Golden and Halpern, "Critical Areas Study for the Pinelands," prepared for the New Jersey Pinelands Commission, May 1980.

Ross, Hardies, O'Keefe, Babcock and Parsons,

"Local and State Regulations of Potential Relevance for the New Jersey Pinelands," a report to the Pinelands Commission.

"Volume 1 -- Introduction, Summary and Analysis," Procedural and Substantive Land Management Techniques of Potential Relevance for the New Jersey Pinelands, a report to the Pinelands Commission, 1980.

"Volume 2 -- Organizational, Structural and Procedural Elements," Procedural and Substantive Land Management Techniques of Potential Relevance for the New Jersey Pinelands, a report to the Pinelands Commission, 1980.

"Volume 3 -- Substantive Elements," Procedural and Substantive Land Management Techniques of Potential Relevance for the New Jersey Pinelands, a report to the Pinelands Commission, 1980.

"Volume 4 -- The Foreign Experience," Procedural and Substantive Land Management Techniques of Potential Relevance for the New Jersey Pinelands, a report to the Pinelands Commission, 1980.

"Volume 5 -- 'The Taking Issue and Vested Right,'" Procedural and Substantive Land Management Techniques of Potential Relevance for the New Jersey Pinelands, a report to the Pinelands Commission, 1980.

Rutgers University, Center for Coastal and Environmental Studies, "A Plan for a Pinelands National Preserve," July 1978.

Rutgers University, in conjunction with New Jersey Department of Environmental Protection, "Natural and Cultural Resources of the New Jersey Pine Barrens," May 1978.

Sargent, Frederic O.,

"Motives for Outdoor Recreation," Volume 1, No. 1, Summer 1972.

"Scenery Classification," Vermont Resources Research Center, Report 18, September 1967.

Sentinel Ledger, "Year of the Coast," 47th Annual Spring Edition, April 17, 1980.

Shafer, Elwood, Jr., "Natural Landscape Preferences: A Predictive Model: A Reply," Journal of Leisure Research, Volume 1, No. 2.

Shafer, Elwood L, Jr. and John F. Hamilton, Jr. and Elizabeth A. Schmidt, "Natural Landscape Preferences: A Predictive Model," Journal of Leisure Research, Volume 1, No. 1, Winter 1969.

Shafer, Elwood L., Jr. and James Mietz, "Esthetic and Emotional Experiences Rate High with Northeast Wilderness Hikers," Environment and Behavior, Volume 1, No. 2, December 1969.

Sinton, John W., "An Inventory of Historic and Cultural Resources of the New Jersey Pinelands," prepared for the New Jersey Pinelands Commission, February 15, 1980.

Sinton, John W., and Richard A. Regensberg, "Study Unit, Maritime Enterprises".

Sinton, John W., and Richard A. Regensburg and Mary-Ann Thompson, "Policies, Programs and Management Techniques for Cultural and Historic Resources".

Sinton, John W. and Bill Wills, Jr., "Hunting Clubs in the Pine Barrens," Volume 1, No.3, New Jersey Folklore, A Statewide Journal, Spring 1978.

South Jersey Resource Conservation and Development Council, "South Jersey Resource Conservation and Development Plan," April 1979.

South Jersey Tourism Council, "South Jersey Tourism," January 1980.

Stankey, George H., "Visitor Perception of Wilderness Recreation Carrying Capacity," United States Department of Agriculture, Forest Service, Research Paper, INT 42, 1973, an abstract.

Stankey, George H. and David W. Lime, "Recreational Carrying Capacity: An Annotated Bibliography," United States Department of Agriculture, Forest Service, General Technical Report, INT-3, March 1973.

Stankey, George H. and Robert C. Lucas and David W. Lime, "Crowding in Parks and Wilderness," reprint from Design and Environment, Fall 1976.

Steinitz, Carl and C.J. Frederick and William Blair, "The Visual Model," in Interaction Between Urbanization and Land: Quality and Quantity in Environmental Planning and Design, Annual Report and Appendix, December 1973.

Stockton State College, "Economic Impact of the New Jersey Travel and Resort Industry," prepared for the New Jersey Travel and Resort Industry Association.

T. Lloyd Associates, "Aquatic Ecology of the New Jersey Pinelands," prepared for the New Jersey Pinelands Commission, February 1980.

Thomas, Lester S., "The Pine Barrens of New Jersey," 1977.

Tipton, Ron, "Comments of the Wilderness Society on the Draft Comprehensive Management Plan for the New Jersey Pinelands," July 23, 1980.

Townplan Associates, "Woodland Township Master Plan," Burlington County, New Jersey, 1978.

Township of Bass River, "Bass River Township Master Plan," draft December 22, 1978.

Township of Buena Vista, Planning Board, "Buena Vista Township Future Land Use Plan," 1979.

Township of Dennis, County of Cape May, State of New Jersey, "Ordinance No. 59-1," reprint, considered for adoption February 9, 1959.

"Ordinance No. 64-2," reprint, adopted December 22, 1964.

"Ordinance No. 71-3," reprint, adopted May 24, 1971.

"Ordinance No. 71-4," reprint, adopted July 25, 1971.

"Ordinance No. 75-15," reprint, considered for adoption June 23, 1975.

- "Ordinance No. 79-62," reprint, considered for adoption March 26, 1979.
- Township of Eagleswood, County of Ocean, State of New Jersey, "The Comprehensive Zoning Ordinance," February 13, 1975.
- Township of Franklin, "Franklin Township Master Plan".
- Township of Galloway, "Land Use Management Plan," Atlantic County, New Jersey, December 1978.
- Township of Hamilton, "Master Plan, 1978," Volume 2: Future Land Use, 1978.
- Township of North Hanover, "Master Plan and Summary of Proposals," June 1978.
- Township of Manchester, "Manchester Township Zoning Ordinance," Ocean County, New Jersey, 1978.
- Township of Maurice River, "Master Plan," adopted March 14, 1979.
- Township of Middle, County of Cape May, State of New Jersey,  
"Ordinance No. 160," reprint, January 18, 1962.
- "Ordinance No. 193," reprint, December 17, 1964.
- "Ordinance No. 202," reprint, June 17, 1965.
- "Ordinance No. 208," reprint, October 6, 1966.
- "Ordinance No. 214-67," reprint, February 2, 1967.
- "Ordinance No. 225-68," reprint, considered for adoption September 5, 1968.
- "Ordinance No. 232-68," reprint, November 21, 1968.
- "Ordinance No. 236-69," adopted August 21, 1969.
- "Ordinance No. 238-69," reprint, adopted September 4, 1969.
- "Ordinance No. 242-69," reprint, adopted January 15, 1970.
- "Ordinance No. 290-74," reprint, adopted February 21, 1974.
- "Ordinance No. 295-74," reprint, adopted July 18, 1974.
- "Ordinance No. 367-79, reprint.
- "Ordinance No. 368-79, reprint, adopted May 3, 1979.
- Township of Ocean, Planning Board, "Ocean Township Master Plan," Ocean County, New Jersey, October 1973.
- Township of Springfield, "Master Plan," 1977.
- Township of Waterford, "Township of Waterford Zoning Ordinance," (Waterford Code), November 1979.

Township of Waterford, Land Use Committee, "Master Plan for Waterford Township," Camden County, New Jersey.

Township of Woodland, "Woodland Master Plan Program," 1978.

United States Department of Agriculture, Forest Service,  
"National Forest Landscape Management," Volume 1, Agriculture Handbook,  
Number 434, 1976.

"National Forest Landscape Management," Volume 2, Chapter 2, Utilities,  
Agriculture Handbook, No. 478.

"Proceedings: River Recreation Management and Research Symposium,"  
General Technical Report NC-28, 1977.

United States Department of Agriculture, Soil Conservation Service,  
"Soil Survey of Burlington County, New Jersey," October 1971.

"Soil Survey of Cape May County, New Jersey," February 1977.

"Soil Survey of Cumberland County, New Jersey," April 1978.

United States Department of the Interior, Bureau of Land Management,  
"Use Data - Wild and Scenic Rivers," memorandum from Director, Bureau of  
Land Management to Director, Bureau of Outdoor Recreation, received April  
15, 1975.

"Visual Resource Contrast Rating," December 1975.

"Visual Resource Inventory and Evaluation," December 1975.

"Visual Resource Management," December 1975.

United States Department of the Interior, Bureau of Outdoor Recreation,  
"Carrying Capacity of Outdoor Recreation Resources," a report proposed by  
Federal Work Group E, Nationwide Outdoor Recreation Plan, January 2, 1973.

"Outdoor Recreation, A Legacy for America," Appendix "A", An Economic  
Analysis, December 1973.

"Outdoor Recreation Space Standards".

United States Department of the Interior, Bureau of Outdoor Recreation, National  
Park Service,  
"National Parks and Recreation Act of 1978".

"National Parks Systems and Related Areas, Index 1979," as of June 30, 1979.

"Pine Barrens of New Jersey," Study Report.

United States Department of the Interior, Heritage Conservation and Recreation  
Service, "Preliminary List of Rivers Under Evaluation," draft, January 1980.

United States Department of the Interior, Heritage Conservation and Recreation Service, Bureau of Outdoor Recreation, 'Appendix M - Outdoor Recreation,' North Atlantic Regional Water Resources Study, prepared for the North Atlantic Regional Water Resources Study Coordinating Committee, May 1972.

United States Department of the Interior, Heritage Conservation and Recreation Service and the New Jersey Pinelands Commission and the New Jersey Department of Environmental Protection, Division of Coastal Resources and Office of Green Acres State Heritage Program,  
'The Pinelands Scenic Study,' Summary Report.

'The Pinelands Scenic Study,' draft for review, 1980.

Urban Research Development Corporation, 'Guidelines for Understanding and Determining Optimum Recreation Carrying Capacity,' prepared for the Bureau of Outdoor Recreation, United States Department of the Interior, January 1977.

Van Doren, Carlton S. and George B. Priddle and John E. Lewis, Land and Leisure: Concepts and Methods in Outdoor Recreation, Maaroufa Press, Inc.: Chicago, 1979.

Vineland Zoning Ordinance, 'Vineland Zoning Ordinance,' excerpts, 1979.

Wang, Tommy Chi-Chung, 'Visual Responses to Landscape 'Preference',' Harvard Graduate School of Design, Department of Landscape Architecture: Cambridge, Massachusetts, May 1973.

WAPORA, Inc.,

'Volume 1, Impact and Management Report,' The Estuarine Study, prepared for New Jersey Department of Environmental Protection, Division of Coastal Resources, September 28, 1979.

'Volume 2, Use Appendix,' The Estuarine Study, prepared for New Jersey Department of Environmental Protection, Division of Coastal Resources, September 28, 1979.

'Volume 3, Environmental Impact Matrices,' The Estuarine Study, prepared for New Jersey Department of Environmental Protection, Division of Coastal Resources, September 28, 1979.

'Volume 4, Documentation,' The Estuarine Study, prepared for New Jersey Department of Environmental Protection, Division of Coastal Resources, September 28, 1979.

Way, Douglas and James Knode, 'Visual Color Absorptive Levels in Typical Vegetative Associations,' in A Study of Resource Use in Urbanizing Watersheds, Plan Formulation and Evaluation Studies - Environmental Analysis, Corps of Engineers, Department of the Army, Washington, June 1970.

West, Gordon E., 'National Landscape Preferences: A Predictive Model: Comments,' Journal of Leisure Research, Volume 1, no. 2.

Wilbur Smith and Associates, 'Short Range Transit Plan, Atlantic County, New Jersey,' prepared for the Atlantic County Planning Board, June 1977.

Wills, Anderson and Lord and Land Design, Inc., "Tabernacle Master Plan Program," August 1975.

Wills, Anderson and Lord and Natural Resource Studies, "Woodland Master Plan Program," Burlington County, New Jersey, October 1977.

Wolf, Howard J., "Pinelands Acquisitions Status Summary".

Woodall Publishing Company, "1980 New York - New Jersey Campground Directory".

Zich, Hil, "Places to Fish in New Jersey," reprint from New Jersey Outdoors, May-June 1976.

Zimolzak, Czesłowa J., "Maurice River Waterfront Developments," for Cumberland County Planning Board.

Zube, Ervin H., "Rating Everyday Rural Landscapes of the Northeastern United States," Landscape Architecture, July 1973.



Sources: Booklets, Brochures, Leaflets, Lists, Personal Correspondence

Absecon Trail, "Absecon Trail, A Self-guiding Nature Walk in Bass River State Forest".

Aladdin Color, Inc.,  
"Big Timber Lake".

"Sea Grove Campground," 1980.

American Motorcyclist Association, "Government Relations Information, Land Use Kit".

Antique Alley, "Antique Alley," southern New Jersey.

Atlantic County Extension Service, Division of Rutgers University, Cook College,  
"Campground 1979".

Bel Haven Canoe Rentals, "Bel Haven Canoe Rentals," Green Bank, New Jersey.

Bel Haven Lake, "Bel Haven Lake Canoe Rentals and Sales," Green Bank, New Jersey.

Blue Dolphin Campgrounds and Lakes, "Blue Dolphin Campgrounds and Lakes," Cape May Court House, New Jersey.

Brigantine Country Club, "Golf and Tennis at the Brigantine Country Club".

Buena Vista Camping World, "Buena Vista Camping World".

Cedar Creek Campground, "Welcome to Cedar Creek Campground," Bayville, New Jersey.

Cedar Swamp Creek Canoe Rentals, "Cedar Swamp Creek Canoe Rentals," Greenfield,  
New Jersey.

Coastline Advertising, "Echo Farm Campground," 1978.

Coastline Product,  
"Riverview Campground," 1980.

"Welcome to the Wonderful World of Camping at Ocean View Campground".

Colonial Meadows Family Campground, "Colonial Meadows Family Campground,"  
English Creek, New Jersey.

County of Burlington, Community Information and Referral Service, "Community  
Information and Referral Service," April 1978.

County of Burlington, Cultural and Heritage Commission, "Structure and Ornament,  
A Guide to Architectural Styles in Burlington County, New Jersey, 1700-1900,"  
1979.

County of Cape May, Chamber of Commerce,  
"Calendar of Events, 1979".

"Jersey Cape Vacation Guide and Membership Directory".

"Wagon Wheel Campground".

County of Cape May, Department of Public Affairs,  
"Golf is Fun in Cape May County, New Jersey".

"Historic Points of Interest on the Jersey Cape".

County of Cape May, Planning Board,  
"Campground Study".

"Campgrounds in Area and Total Number of Sites as of June 1979".

County of Gloucester, Planning Department,  
"Park and Recreation Inventory - Neighborhood, Community Parks and Resource Areas," May 1975.

"Park and Recreation Inventory - Playfields," May 1975.

"Park and Recreation Inventory - Playgrounds," May 1975.

County of Ocean, Cultural and Heritage Commission, "Going Our Way? A Guide to Places of Historic and Cultural Interest in Ocean County," J.I. Farley Printing Service, Inc.: Breck Township, New Jersey, January 1979.

County of Ocean, Office of Tourism, Visitors Bureau, "Ocean County, New Jersey - Always in Season".

Driftwood Campgrounds, "Driftwood Campgrounds," Cape May Court House, New Jersey.

East Coast Enduro Association, Rule Book, August 1979.

Egg Harbor River Campground, "Egg Harbor River Campground," English Creek, New Jersey.

Frontier Campground, "Frontier Campground," Ocean View, New Jersey.

Greater Toms River Chamber of Commerce, "The Good Life," 1977-1978.

Green Holly Campground, "Green Holly Campground," Goshen, New Jersey.

Hack's Canoe Retreat, "Hack's Canoe Retreat," Rancocas Creek, New Jersey.

Hidden Acres Campground, "Hidden Acres Campground," Clermont, New Jersey, 1980.

Historic Towne of Smithville, "Historic Towne of Smithville".

Jersey Central Power and Light, "Explore the World of Energy".

KOA Campground, "Atlantic City Casino KOA - Closest KOA to Casinos," Pleasantville, New Jersey.

Leaming Run Botanical Garden, "Leaming Run Botanical Garden," Cape May County Court House, New Jersey.

- Liggett, Barbara, Ph.D. and Budd Wilson, "Historic Archaeological and Architectural Report," prepared for the Pine Barrens Commission, 1980.
- Lenape Park, "Lenape Park," Mays Landing, New Jersey.
- Little Oaks Campground, "Little Oaks Campground," South Seaville, New Jersey.
- Martin, William E., "An Unspoiled Bit of Atlantic Coast," Bulletin 11, New Jersey State Museum, Trenton, February 1970.
- Michalsky, Barbara V., "Whitesbog, An Historical Sketch," October 1978.
- Mick's Canoe Rental and Sales, "Mick's Canoe Rental and Sales," Chatsworth, New Jersey.
- Monahan, Charles P., New Jersey Department of Transportation, personal correspondence to Thomas Comitta, Comitta Frederick Associates, re: Rest Areas and Picnic Tables in New Jersey, May 29, 1980.
- Mullica River Boat Basin, "Mullica River Boat Basin," Egg Harbor, New Jersey.
- Mullica River Marina, "Mullica River Marina," Sweetwater, New Jersey.
- Mc Cormick, Jack, "The Pine Barrens - A Preliminary Ecological Inventory," Report No. 2, New Jersey State Museum, Trenton, December 1970.
- New Jersey American Revolution Bicentennial Celebration Commission, "New Jersey: Crossroads of the Revolution".
- New Jersey Department of Community Affairs, Division of State and Regional Planning, "PT-1, New Jersey County and Municipal Work Sheets," January 1976.
- "PT-3, State-Owned Real Property in New Jersey".
- "PT-4, Federal-Owned Real Property in New Jersey," July 1976.
- "PT-5, County-Owned Real Property in New Jersey," January 1974.
- New Jersey Department of Conservation and Economic Development, Bureau of Maps and Publications, "Know Your State, A Factual Outline of New Jersey," 1966.
- New Jersey Department of Conservation and Economic Development, Bureau of Recreation, "Surfing and Water Skiing in New Jersey".
- New Jersey Department of Conservation and Economic Development, Division of Fish and Game, "The Ballantine Hunting Guide of New Jersey".
- New Jersey Department of Environmental Protection, Division of Coastal Resources, "The Jersey Coast," No. 13, January 1980.
- "The Jersey Coast," No. 14, April-May 1980.
- "The Jersey Coast," No. 14, May-June 1980.

New Jersey Department of Environmental Protection, Division of Fish, Game and Shellfisheries,  
 "Summary of New Jersey's Recreationally Oriented Shellfishing Laws and Regulations".

"The Fish and Wildlife Financial Crisis in New Jersey," 1979.

New Jersey Department of Environmental Protection, Division of Fish, Game and Shellfisheries, Bureau of Wildlife Management, "1979 - New Jersey Deer Guide".

New Jersey Department of Environmental Protection, Division of Marine Services,  
 "A Guide to New Jersey Beaches, 1979".

"Clam Handbook," May 1979

New Jersey Department of Environmental Protection, Division of Parks and Forestry,  
 "Aeolium Visitor Center - Island Beach State Park," November 1974.

"Attendance - State Forests, Fiscal Year 1979".

"Attendance - State Parks, Fiscal Year 1979".

"Bass River State Forest Cabin Information".

"Bass River State Forest, Camp Shelter Information," May 1, 1976.

"Batona Trail," 1979.

"Breeding Birds of the Wharton Tract".

"Helpful Rules for Canoeists to Follow; Maxims for Canoeists".

"Historic Batsto".

"Historic Sites - Income and Attendance, Fiscal Year 1979".

"Income - State Forests, Fiscal Year 1978".

"Income - State Forests, Fiscal Year 1979".

"Income - State Parks, Fiscal Year 1978".

"Income - State Parks, Fiscal Year 1979".

"Information Concerning East Creek Lodge Facilities, Belleplain State Forest".

"Information for Group Tours, Batsto Village and Nature Area".

"Island Beach State Park Beach Shuttle".

"Island Beach State Park, Information and Procedures," January 1980.

"Island Beach State Park, Rules and Regulations".

"Lebanon State Forest, Cabin Information," May 22, 1976.

"Mammals of the Pine Barren".

"Nature's Paintbrush Colors New Jersey Beautiful," September 1978.

"Plant Life of Island Beach State Park," April 1975.

"Plant Life of Wharton State Forest," 1979.

"State Forests and Parks Campgrounds".

"Welcome to Bass River State Forest".

"Welcome to Lebanon State Forest," March 1979.

"Wharton State Forest Cabin Information".

"Wharton State Forest Facilities," June 30, 1977.

New Jersey Department of Environmental Protection, Green Acres and Recreation Program, "Applications by Local Governments - Submitted and Approved as of November 8, 1979," Green Acres Local Assistance Program.

New Jersey Department of Labor and Industry, Division of Travel and Tourism, "A Listing of New Jersey Associations and Executive Officers," November 1974.

"A Listing of New Jersey Associations and Executive Officers, Room 103, State House Annex".

"A Listing of New Jersey Campsites," May 1978.

"A Listing of New Jersey Chamber of Commerce Offices and Executive Officers," September 1977.

"A Listing of Some Commercial Picnic Areas in New Jersey," January 1978.

"An Invitation to Visit New Jersey".

"Canoe Runs in New Jersey".

"New Jersey's Got It! In the Springtime ... and Year 'Round!"

"New Jersey's Got It! Your 1980's Vacation Guide".

"Tours Are Yours in New Jersey," 1979.

New Jersey Department of Transportation,

"Checkpoints - A Guide to Services and Information," February 1980.

"Scenic and Historic Tours of New Jersey, Crossroads of the Revolution," April 1979.

New Jersey Department of Transportation, Highway Authority,  
"Garden State Parkway, Directory of Exits," June 1978.

"Regulations Governing Use of the Garden State Parkway".

New Jersey Geological Survey, "List of Maps and Publications Available," April 1980.

New Jersey Private Campgrounds Association, "1980 Directory".

New Jersey Trappers' Association, Inc., "Constitution; and Aims and Purposes,"  
established October 1961.

North American Game Breeders Association, "State by State Listings of Shooting  
Preserves in Your Region," reprint from Outdoor Life, September 1976.

Northfield, Department of Parks and Recreation, "Birch Grove Park," Northfield,  
New Jersey.

Oak Ridge Campground, "Oak Ridge Campground," Marmora, New Jersey.

Paradise Lakes, "Paradise Lakes Canoe Rentals," Hammonton, New Jersey.

Paradise Lakes Campground, "Paradise Lake Campground," Hammonton, New Jersey.

Parnes, Robert, Canoeing the Jersey Pine Barrens, The East Woods Press, Inc:  
Charlotte, North Carolina, 1978.

Pine Barrens Canoe Rental, "Pine Barrens Canoe Rental," Chatsworth, New Jersey.

Pine Haven Campground, "Pine Haven Campground," Ocean View, New Jersey, 1980.

Pineland Canoes, Inc., "Pineland Canoes, Inc.," Jackson, New Jersey.

Ponderosa Camp Ground, "Ponderosa Camp Ground," Swainton, New Jersey, 1980.

Poor, Harold L., Bicycling in New Jersey, 30 Tours, Ridley Enslow Publishers:  
Short Hills, New Jersey, 1978.

Porcella, Santiago, III, "List of New Jersey's Biggest Trees".

Pyle, A. Bruce, "Report on Fishery Resources of the Pinelands," personal memor-  
andum to Pete McClain, January 21, 1980.

Renault Winery, "Historic Renault Winery," Egg Harbor City, New Jersey.

Shady Pines Campground, "Shady Pines Campground," Absecon Highlands, New Jersey.

Travel Trade Publications, Inc., "1980 New Jersey Sales Guide," December 31, 1979.

United States Department of Agriculture, Soil Conservation Service, "Maintenance  
Tips for Recreation Trails and Walkways," August 1976.

United States Department of Commerce, "Approved Tracts, Cape May County, New  
Jersey".

United States Department of the Interior, Geological Survey, "Brigantine National Wildlife Refuge," Refuge Leaflet 40-R5, May 1963.

United States Department of the Interior, Heritage Conservation and Recreation Service,

"Recreation Rivers Study," draft of Preliminary List of Rivers Under Evaluation, January 1980.

"Wild and Scenic Rivers System Study," final list of Potential National Wild and Scenic Rivers, January 1979.

Urban Suburban Environments, "Summer at the Wildcat Mountain Wilderness Center, Project USE 1980".

Wading Pines Campground, "Wading Pines Campground," Chatsworth, New Jersey, 1976.

Wardle, Eric,

"Old Stagecoach Campground".

"Surf and Stream Campground".

"Tamerlane Campground," 1975.

"Timberline Lake Camping Resort," 1979.

Winding River Campground, "Winding River Campground, Finest Casino Camping," Mays Landing, New Jersey.

Sources: Directories

Cape May County Campground Association, "Map and Directory of Private Campgrounds on the New Jersey Cape," 1980.

Cape May County Human Services Coalition, "The People's Guide to Service," 1979.

Coastline Advertising, "New Jersey Camping - Directory and Map to the Garden State's Finest Privately Owned Campgrounds," 1975.

County of Burlington, "Department Directory".

County of Burlington, Board of Freeholders, "Directory of County, City, Borough and Township Offices," Print World: Bordentown, New Jersey, 1980.

County of Camden, Parks Eco-Center, "Environmental Directory: Organizations, Agencies and Institutions Serving Camden, Burlington and Gloucester Counties," May 29, 1975.

County of Camden, Planning Department, "Directory of Camden County Federal, State, County and Municipal Officials," Summer 1979.

County of Cape May, Chamber of Commerce,  
"Classified Membership Directory," 1979.

"1977 Directory of Clubs and Organizations".

County of Cape May, New Jersey, "Directory of County and Municipal Officials," 1979.

County of Cumberland, Board of Chosen Freeholders, "Cumberland County, New Jersey 1980 Official Directory".

County of Gloucester, Board of Chosen Freeholders,  
"Gloucester Board of Chosen Freeholders," 1979.

"Official Directory of Gloucester County, New Jersey," 1979.

"Official Directory of Gloucester County, New Jersey," 1980.

County of Ocean, Office on Aging, "Fact Book for Senior Citizens," County Printing Department: Toms River, New Jersey, 1979.

County of Ocean, Office of Public Information, "Ocean County Government Directory, 1980".

County of Ocean, Office of Tourism Advisory,  
"Ocean County Government Directory, 1980".

"The Yacht Clubs of Ocean County," News Release, April 22, 1980.

New Jersey County Planner's Association, "Directory".

New Jersey Department of Agriculture, "1977 Directory, New Jersey Agricultural Organizations".



Ross, William H., III and Rosemary T. DaGrossa, 'Manuals of the County of Atlantic, 1979'.

South Jersey Tourism Council, 'Visitor Services'.

Sources: Maps

- All Year Club of Southern New Jersey, 'Your All Year Sight Map of Southern New Jersey,' 1978.
- County of Atlantic, Planning Board, 'Composite Zoning Map'.
- County of Burlington, Board of Freeholders, 'Road Map of Burlington County, New Jersey,' 1977.
- County of Camden, Board of Freeholders, 'Camden County Map and Guide'.
- County of Camden, Planning Department,  
     'Composite Zoning, Camden County,' 1975.
- 'Comprehensive Plan, Camden County,' 1972.
- 'Future Land Use Plan, Camden County,' 1971.
- 'Generalized Land Use, Camden County,' 1971
- County of Cape May, Chamber of Commerce, 'Official Map of Cape May County,' 1977.
- County of Cape May, Planning Board,  
     'Campsite Zoning Map'.
- 'Cape May County Comprehensive Plan,' Plate XIX, December 1977.
- 'Cape May County, New Jersey,' 1972.
- 'Cape May County, New Jersey, Official Map'.
- County of Cumberland, Board of Chosen Freeholders, 'Map of Cumberland County, New Jersey,' 1977.
- County of Cumberland, New Jersey, Tourist Information Center, Inc., 'Cumberland County, New Jersey'.
- County of Cumberland, Planning Board, 'Historic Sites of Cumberland County, New Jersey,' September 1973.
- County of Gloucester, Board of Chosen Freeholders, 'Map of Gloucester County, New Jersey,' 1976.
- County of Gloucester, Planning and Engineering Departments, 'Official County Map, Gloucester County, New Jersey,' 1978.
- County of Ocean, Planning Board,  
     'County Plan Alternative,' June 1977.
- 'Developed Land Areas,' base map prepared November 1978.
- 'Existing Zoning,' base map prepared February 1976.

"Local Plan Alternative," June 1977.

"1980 Functional Classification of Roads," 1980.

"1977 Existing Land Use," 1977.

"Summary of Environmentally Sensitive Areas," base map prepared February 1976.

Delaware Valley Regional Planning Commission, "Year 2000 Land Use and Open Space Plan," draft, October 1978.

Greater Toms River Chamber of Commerce, "Map and Visitors Guide," 1979.

Hagstrom Company, Inc.,

"Hagstrom Map of Ocean County, New Jersey," 1980.

"Ocean County -- Always in Season," 1980.

New Jersey Department of Community Affairs, Division of State and Regional Planning, "Political Subdivisions of New Jersey," 1976.

New Jersey Department of Environmental Protection,  
"Bass River State Forest".

"Canoe Campsite Map of the West Branch of the Wading River, Wharton State Forest," 1975.

"Hiking Trails in New Jersey," 1970.

"Major Public Open Space and Recreation Areas in New Jersey as of November 1977".

New Jersey Department of Environmental Protection, Division of Parks and Forestry,  
"Atsion Lake Family Campsites, Wharton State Forest".

"Belleplain State Forest," 1976.

"Bodine Field Campsite".

"Godfrey Bridge Family Camping Area, Wharton State Forest".

"Goshen Pond Camping Area," 1977.

"Island Beach State Park".

"Lebanon State Forest".

"Lebanon State Forest Camping Area," 1974.

"Lower Forge Wilderness Area".

"Mullica River Wilderness Area".

"Wharton State Forest".

New Jersey Department of Environmental Protection, Division of Water Resources,  
 "New Jersey Surface Water Classifications Map," December 1976.

New Jersey Department of Transportation, "Rest Areas and Overlooks," 1968.

New Jersey Department of Transportation, Division of Comprehensive Transportation  
 Planning, "Railroad Service Map, State of New Jersey," 1976.

New Jersey Department of Transportation, Division of Planning,  
 "Base Map, Burlington County, New Jersey," Sheets 1, 2, 3, 4, 5, 6, 7, 8,  
 9, 1967.

"Base Map, Ocean County, New Jersey," Sheets 1, 2, 3, 4, 5, 6, 7, 8, 9, 1967.

"General Highway Map, Cumberland County, New Jersey," Sheets 1, 3, 5, 7, 1971.

"General Highway Map, Gloucester County, New Jersey," Sheets 1, 2, 1970.

"General Highway Map, Passaic County, New Jersey," Sheets 1, 2, 4, 1964.

New Jersey Expressway Authority, "Atlantic City Expressway Route Map".

New Jersey Pinelands Commission,  
 "New Jersey Pinelands," March 1980.

"Pinelands of New Jersey," October 19, 1979.

Quinn and Associates, "Gloucester County, New Jersey," used in conjunction with  
 lists of Park and Recreation Inventory, Gloucester County, New Jersey.

Shenley, C., "Horse Trails, Penn State Forest," March 17, 1976.

Township of Middle, "Zoning Map," County of Cape May, New Jersey.

United States Department of the Interior, Geological Survey,  
 "Map of Cape May County, New Jersey," 1966.

"New Jersey Base Map with Highways and Contours," 1975.

"New Jersey Satellite Image Mosaic," 1972.

"New Jersey Shaded Relief," 1971.

"State of New Jersey, Base Map," 1975.

United States Department of the Interior, Geological Survey and the National  
 Ocean Survey, "Wilmington NJ 18-2, Topographic-Bathymetric Series," 1972.

United States Department of the Interior, Heritage Conservation and Recreation  
 Service, "Wild and Scenic Rivers System Study Map," October 1978.

United States Topographic Command (TPC),  
 "Newark," No. NK18-11, Series V501, Edition 3, 1969.

"Salisbury," NJ18-5, Series V501, Edition 4, 1969.

Widmer, Kimble, State Geologist,

"Land Use Overlay, Sheet 28," prepared for New Jersey Department of Environmental Protection, 1977.

"Land Use Overlay, Sheet 29," prepared for New Jersey Department of Environmental Protection, 1977.

"Land Use Overlay, Sheet 31," prepared for New Jersey Department of Environmental Protection, 1978.

"Land Use Overlay, Sheet 32," prepared for New Jersey Department of Environmental Protection, 1978.

"Land Use Overlay, Sheet 33," prepared for New Jersey Department of Environmental Protection, 1977.

"Land Use Overlay, Sheet 35," prepared for New Jersey Department of Environmental Protection, 1978.

"Land Use Overlay, Sheet 36(37)," prepared for New Jersey Department of Environmental Protection, 1977.

Winding River Campground, "River Route Map," Mays Landing, New Jersey.