SOUTH FLORIDA RESEARCH CENTER

Report T-619
Fire History and Fire Records for Everglades National Park 1948–1979

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FIRE HISTORY AND FIRE RECORDS

for

EVERGLADES NATIONAL PARK

1948-1979

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INTRODUCTION

Fire records are necessary to document fire frequency, seasonal occurrence, size, cause, location, conditions under which habitat types burn, manpower requirements, management techniques, and other factors. Traditional fire history information (Arno and Sneck, 1977) is less available for south Florida than for other areas within the U.S. because burned areas revegetate rapidly, and fire scarred trees either do not have annual rings or else the rings are difficult to interpret (Taylor, in press). Good fire records are extremely important as they represent almost the only valid data on fire history. Even so, Robertson (1953) states south Florida is perhaps unique in that it has had more fires and kept less account of them than any other section of the country.

The purpose of this report is to review fire history and actions that led to current fire management alternatives, to organize and tabulate fire records from 1948 through 1979 drawn together from scattered sources, and to review changes in causes of fires that have occurred during the 32-year period of record. (Fire history for years prior to establishment of Everglades as a park are reviewed by Robertson (1953) and are included in this report as Appendix III.) Objectives of current fire management activities are reviewed.

Everglades National Park files have been searched for letters, memorandums, and reports that deal with fire history within the park. All individual fire reports that could be located have been placed in a permanent file in the Resources Management office at Pine Island near park headquarters.

Fire records showed cause of fire to be from lightning, by man, or from prescribed fire. Man-caused fires included unauthorized fires set by man or by activities of man such as farming operations, hunting, and lumbering. Lightning fires include any ignition known to have resulted from a lightning strike. Prescribed fires are those fires set by managers for a specified purpose. Wildfire, as used in the records and in this report, indicates any man-caused or lightning-caused fire that was not a prescribed fire.

Available records were used to tabulate data on fires from 1948, the first full year for Everglades as a National Park, through 1979 (Appendix I). Records summarizing routine prescribed burns are included as Appendix II. Fire numbers referred to in this report reflect the year the fire occurred and the fire number for the year. For example, 6906 refers to 1969 fire 6. Appendix I shows 6906 to be the Bad News fire of April 24, 1969. Not all records were located, however, as shown by data for 1971 and 1972. Klukas (1972) states 13,500 acres were control burned in 1971. Our records show only 11,361 acres control burned and a total of 13,825 acres burned during the year. For 1972 our records show 74 total fires, both inside and outside the park, but Bancroft (January 5, 1972 memorandum to the Superintendent) totaled 105 fires for the year, 30 wildfires and 74 prescribed fires. The difference in numbers is usually due to a casual method of record keeping for prescribed fires during the first years of prescribed burning. No formal method for reporting prescribed burns was available until a prescribed burning procedures manual was written in 1973 (Bancroft, 1973). Currently, all known fires from all causes are recorded.

Boundary lines for Everglades National Park have expanded since the park was established and most private inholdings inside the park have been purchased. All fires that occurred inside the 1979 Everglades National Park boundary, even those on former private lands, have been included as "inside" the park. Records for fires that occurred outside the 1979 park boundary, the Everglades Fire Protection Zone, have been separated from Everglades National Park fire statistics and listed as a separate unit, "Fires Outside the Park" (Table 3, and indicated by * in Appendix I).

The 1948-1979 period covered in this report is for a time when south Florida was undergoing a population boom (35% increase between 1960 and 1970), the water table was dropping, the hydroperiod was being drastically shortened, and several exotic plant species became established that have the potential for expansion into disturbed areas (Wade, et al., 1980). Robertson (1953) stated that wildfires gained a new importance under the radically altered conditions of lowered water tables. Fires destroyed organic soils and destroyed hardwood hammocks.

SUBTROPICAL FIRES

Fires in the subtropical Everglades differ from fires that occur in other national parks areas. For example, the narrative for fire 6906 states:

> "Park personnel, because of frequent transfer, suffer from a lack of knowledge of adequate experience in fires occurring in sub-tropical types. Greater knowledge must be obtained by fire fighters to effectively understand local fuel and weather conditions influencing fires in this area."

During the critique on the Shark Valley fire (fire 6222) Mr. Fred Arnold, Regional Forester, spoke about the knowledge gained by crews on the fire, but that it was actually the same knowledge gained ten years ago on other large fires in the Everglades. He lamented the knowledge was lost through transfer.

Fuel and substrate vary from understory hardwoods and grass on rock in the pinelands, to soft marl soil and short grass fuel in prairies, to deep muck soils often supporting six foot tall sawgrass and saltmarsh species. Weather conditions vary from extreme drought to flood. Burning conditions under these varying situations are illustrated by notes from the following two individual fire reports:

Fire 4929, November 11, 1949, burned 16.8 acres:

> "The individual fire report becomes pitifully inadequate in trying to describe this fire and our amazement as we swing fire flaps, each swing splashing us from head to foot, walking in water sometimes halfway to our knees with minnows darting ahead of us. The grass was dense and about two feet high and apparently quite dry above the water line. At times the fire was too hot to reach with flaps and we were forced to wait until it subsided. Most of the time, however, the flaps coupled with the showers they produced were very effective. Little difficulty was encountered in controlling the fire."

Fire 7436 occurred between May 4 and July 3, 1974, and burned 13,005 acres under drought conditions. The narrative report states:

> . . ."the fire started on May 4, 3/4 to 1 mile west of the park boundary and about 2½ miles south of State Road 94 . . . The fire was started away from any trail or road on a WSW wind of about 10 mph which would carry the head fire into a narrow strip of unburned area on the boundary. All the park boundary, from 5 miles south to State Road 94, had earlier been prescribed burned, but this one narrow 150 ft. wide strip had not burned-out due to moisture at that time . . . The area is open prairie grass with small, scattered bay heads. Average height of the grass was 3 feet and the area was extremely dry. The actual water table was about 3½ to 4 feet below ground in the lower sloughs within fire range . . ."

The fire was fought by backfiring along the park boundary, and by scouting from the park airplane and helicopter, but the fire burned into the park. On May 5, action was taken to protect power poles and to keep the fire from jumping the road near 40-Mile Bend. A wind of 15-20 mph drove the fire over 3 airboat trails and across a 1 year-old burn. Houses along the Miccosukee strip were being protected by backfiring along the strip and by wetting down thatch-roofed chickees. The fire jumped the road at 40-Mile Bend. Tram operations at the Shark Valley interpretative area were closed down because the fire burned toward the parking lot and threatened to cross the Shark Valley road. Fire trucks were used to patrol the roads and the Thiokol was used in patrol along the park boundary.

Concern for the Miccosukee burial site at Hammock 55 led to a crew being sent via helicopter to put in a hand line around the hammock. This was done by digging 1½ feet deep to dig out burning peat beds. Backfires were set around the north side with fires closest to the hammock being put out. A three-man crew dug a hole to water and set up a drafting operation for hose line lays. When the fire finally approached the unprotected side of the hammock on May 19, the fire line was hosed down and flooded with water to drown out ground fires. The area of Hammock #55 that was unprotected was burned severely with the loss of up to 4 feet of soil and hundreds of hardwoods up to 24 inches in diameter. In large areas, all that remained was the rock shelf of the hammock itself with no live vegetation. Muck fires continued to burn throughout the area until June 12 when they began to go out. Rain on June 13 apparently extinguished the fire and it was declared out July 3.

These two fire conditions in Everglades National Park illustrate many of the problems park managers have faced through the years. For example, National Park Service policy of 1949 dictated fire 4929 be put out when water was so plentiful. On the other hand, fire 7436 illustrates problems faced during drought, problems with structures needing protection, confined use of heavy equipment, use of planes and helicopters, problems with the emerging fire management plan, and ineffectiveness of some boundary burns in containing fire. Each of these factors has a historical base in Everglades National Park and will be reviewed.

NATIONAL PARK SERVICE FIRE MANAGEMENT PHILOSOPHY AND POLICY

Before the National Park Service was created, early superintendents in Yellowstone expressed fear that the forest would be blackened and destroyed without constant vigilance and protection from fires (Langford 1872; Harris, 1886; Wear,

1885; and Conger, 1882). The object was fire protection to preserve. Aggressive fire suppression was National Park Service policy from creation of the National Park Service in 1916 until changed to allow prescribed fires in Everglades National Park in 1958 (discussed below). The Everglades change was specific for one park.

National Park Service policy adhered to the "10 a.m. rule" that all efforts be devoted to control of every fire during the first burning period, and failing that objective, every effort must be made daily to obtain control before the burning period of the following day (Cook, ca 1950). National Park Service Assistant Chief Forester Cook (ca 1950) stated:

> "Effective fire control is one of the most important bridges between preservation of the park areas in their natural state and intensive public use. We cannot afford to permit that bridge to be weakened or broken by relaxed vigilance and action against fire."

According to Kilgore (1976) the document of greatest significance to present National Park Service fire policy was the "Leopold Report" (Leopold, et al., 1963) on wildlife management in national parks presented in 1963. The Leopold Report recognized that:

> "Habitat is not a fixed or stable entity that can be set aside and preserved behind a fence, like a cliff dwelling or petrified tree. Biotic communities change through natural stages of succession . . . active manipulation of habitat is being tested, as for example in the Everglades where controlled burning is now used experimentally to maintain the open glades and piney woods with their interesting plant and animal life."

A February 13, 1967 memorandum from the Assistant Director to the Washington Office and to all field offices reiterated National Park Service policy regarding fire as stated in "NPS Administrative Manual," Organization Volume, Part 5. The policy stated:

> "All fires threatening the natural and cultural resources (historical, recreational) area shall be controlled and extinguished."

The memorandum continued:

> "Historically, fire, whether originating from human carelessness or from natural causes, has been considered to constitute the greatest menace to areas of the National Park System and fire suppression has taken precedence over all other park activities except the safeguarding or saving of human life. All fires burning within an area of the National Park System shall be considered a threat to the natural and cultural resources and shall be controlled and promptly extinguished."

The memorandum made reference to the Leopold, et al. (1963) report and stated that policy statements and guidelines would be forthcoming which would provide the necessary framework for structuring a fire plan for each area. The Leopold Report was largely adopted as National Park Service policy in 1968 (Kilgore 1976).

The 1970 National Park Service administrative policies for natural areas recognized that fire in vegetation is a natural phenomena which may be allowed to run its course when such burning can be contained within predetermined fire management units and when such burning will contribute to the accomplishment of approved vegetation and/or wildlife management objectives.

National Park Service fire management has evolved to the NPS-18 Fire Management Guideline of August 23, 1979. This policy statement recognizes lightning-caused fires as phenomena which must be permitted to continue to influence the ecosystem if truly natural systems are to be perpetuated. Management fires, including both prescribed natural fires (lightning-caused) and prescribed burns are permitted to burn providing they meet objectives and predetermined prescriptions defined in an approved Fire Management Plan. Prescribed natural fire is the preferred means to achieve the prescriptions in natural zones. All fires not classed as management fires are "wildfires" and must be suppressed. Human-caused fires will be controlled to prevent damage and to eliminate impact on the park ecosystems. The fire suppression methods used in parks should be those causing the least resource damage.

FIRE MANAGEMENT IN EVERGLADES NATIONAL PARK

Fire management in Everglades National Park has been at the forefront of National Park Service policy development since the park was established. The park was the first unit where prescribed fire was allowed, and currently, in contrast to official policy, man-caused fires are allowed to burn if they meet defined prescriptions in the approved fire management plan. In addition, Everglades was one of the first parks to implement a fire management plan.

The reason for these developments is that fire is a pervading force in the south Florida environment. Beard (1938) states, "Someone has said Florida burns off twice a year, and that is hardly an exaggeration." Robertson (1953) states, "over and over one hears such statements as, 'This country always has burned and always will. Anyway fires don't hurt anything here'."

During the few short years of a typical park employee's tour of duty in the Everglades, one is able to observe pre-fire vegetation, watch it burn, and (usually) see it recover to the original condition. This short fire cycle is one factor that placed Everglades National Park fire management ahead of western parks where the normal life span of individuals is insufficient to see the entire fire cycle completed, let alone observe it during a brief tour with the National Park Service.

Fire fighting in the Everglades has gone through an evolution of dependence on heavy equipment transported across the glades and oolite rock, fighting fires at night, use of aerial tactics, direct attack, indirect attack, and "observation" of fires. Robertson (1953) stated the first five years of fire fighting (1948-1952) absorbed much productive energy of the Everglades park staff, but inspired no feeling more robust than reserved optimism. Much was learned and a high degree of fire fighting skill attained, but he felt that unless additional water was received through normal sheet flow the best efforts of fire detection and suppression would provide only local victories in a lost war.

Backfiring

One of the most useful and often used methods for fighting fire has been indirect attack by backfiring from a road or natural barrier. Early use of the method is described in fire 4809:

> "The Dade County Fire Control arrived first and possessing only road equipment proceeded to backfire from a road west of the fire. This road is 0.3 miles within the park boundary which accounts for a large part of the fire within the park. It has been a policy in the past for Dade County Fire Control to simply backfire from the nearest road, almost disregarding distance from the fire, due to lack of manpower and equipment."

The writer of the fire report, a National Park Service employee new to the region, felt the fire could have been controlled more efficiently by direct attack with heavy equipment. His recommendations resulted, in part, in a long history of heavy equipment development and use which will be discussed below.

Backfiring was used routinely on pineland prescribed fires. Documentation of use on wildfires is best illustrated by use on the 15,260 acre Phantom Fire in 1972 (fire 7207). Because favorable soil and fuel moisture conditions existed and because of surface damage caused by tracked vehicles, it was decided to control the fire within predetermined boundaries by backfiring from the main park road and to spot fire through use of a helicopter to burn out fuel and reduce the run of head fires. These methods were judged successful and they were recommended for use on future wildfires and prescribed burns.

Equipment

Light equipment, which included back-pack pumps, flaps, rakes, brooms, and other tools have been used since establishment of the park. "Wet water" (Unox) was used as early as 1949 (fire 4932). During early years fires were fought day and night, with fighting continued at night because humidity was high and fires did not spread so rapidly. However, on fire 6906, increased danger from working around solution holes and pinnacle rock at night was recognized and safety considerations dictated fire control operations be stopped at night. Fire fighters are now routinely removed from fires before darkness, but monitors are left to patrol roads in the burn area.

Heavy equipment included tracked vehicles such as D-2, D-7, D-8 bulldozers; Bombardiers; Thiokol; and "weasels" (lighter weight tracked vehicle); tractors; glades buggies; and jeeps. This equipment was used to bulldoze fire lines, to pull a disc (used more frequently in the Fire Control Unit), to pull a 200 or 250 gallon tank and pumper with large tires, or to haul men and equipment. A 250 gallon tank and pumper was first used in 1948, the tractor and glades buggy in 1949, and bulldozers in 1950. Early enthusiasm for heavy equipment use on fires soon faded and by 1956 bulldozers could no longer be used on grassland fires (Everglades National Park Fire Control Plan for 1956). By 1974, the Fire Mangement Plan restricted all vehicles to established roads or to the park boundary (Everglades National Park Fire Management Plan, 1974). Vehicles used on fires frequently broke down, got stuck, or made deep tracks. Bulldozer lines scarred the landscape and are still visible today, 30 years later. A brief chronological history will illustrate the problems encountered by use of heavy equipment and the progressive change in attitude toward the value of heavy equipment on fires.

On fire 4809 indirect attack was started by the Dade County Fire Control unit, but the fire was later attacked directly by National Park Service personnel aided by Florida prison labor. The fire report states "It is believed most of these fires can be suppressed by direct attack, particularly when motorized equipment is available for travel through the glades." The same fire boss felt fire 4909, which burned 5600 acres, could not have been controlled without the use of heavy equipment. Mr. D. Tower, owner of some of the equipment used, and a native of Homestead, stated that this was the first fire he had ever known to be put out in the Everglades, e.g. a fire which was running in the open glades (Fire 4909 narrative report). On fires 4922 and 5002 a tractor and glades buggy were effective in transporting men, equipment and water to the fires. On fire 4931 the trailer pumper, with large dual tires, literally plowed through the muck, and soil rolling up in front of the wheels failed to stop or even stall the buggy. But the following report was more typical (5003):

> "The performance of the buggy was amazing as it towed the trailer through muck with mud piling up in front of the trailer's dual wheels. A point was reached, however, where the trailer-pumper simply sank in the mud and could not be moved . . . . The following day it took the combined efforts of two buggies with long cables to more firm ground to pull the trailer out."

Equipment broke and required repair on fires 5011, 5104*, 5106*, 5124*, 5125*, 5126*, 5408, 5505*, 6201*, 6214*, 6402, 6605, and 7115*. A broken-down Thiokol was damaged by fire on fire 7115*. Equipment was mired in mud on fires 5003, 5006, 5219, 6123, 6604, 7115* and probably others. Frustration with heavy equipment was expressed in fire report 5408:

> "Considerable difficulty was experienced with the equipment in rough terrain in the pine woods. Three tractors had to be pulled off the fire line for repairs and one pumper was damaged. Several hours of valuable time were lost because equipment had to be moved from the fire line. This fire points out our equipment is not suited to the suppression of fires in the pine woods."

Equipment heavy enough to withstand rough terrain in the pine woods sank in muck or marl soils in the prairies.

Tracked bulldozers were used to construct fire lines on fires 5011, 5013, 5015*, 5108, 5112, 5503, 5518*, 5519, 5701, 6219*, 6222, 6312*, 6314*, 6505*, 7115*, and 7116*. The number used varied from one to five dozers working at any one time. On fire 5518* near Pinecrest, outside the park, a bulldozer was used to cut a fire line through a hammock to isolate a spot of burning duff that could not be reached with a tractor-pumper. Even though bulldozers worked better in constructing fire lines in the open glades than in rough pinnacle rock, by 1956 they were determined to be damaging to the resource and were not to be used unless no other means was possible to control a fire (Everglades Fire Control Plan, 1956). In 1957 this plan was tested when, during construction of the main park road, a bulldozer from the construction site was used to encircle a fire (5701) near Mahogany Hammock. The bulldozer was recalled, due to the park policy, but later, four bulldozers were used to make a line for backfiring. Bulldozer use was justified because Mahogany Hammock was to be spared at any cost.

*Denotes fires in the Everglades Protection Zone outside the park.

An end to bulldozer use was coming however, because owners would rather contract out for land clearing than risk breakdown and damage on fires. Because bulldozers scarred the landscape, and were difficult to use on rough pinnacle rock, Superintendent Beard requested a road system be built in the pinelands to stop wasting funds on fireline construction that could not be maintained (Beard, memo to Regional Director, July 27, 1954). The road system was constructed in 1957 (see pinelands section), and bulldozer use was stopped inside the park after 1957 but was continued in the Everglades Protection Zone.

Experience with heavy equipment can be summed up by quoting the following letter (Acting Assistant Regional Director, Operations Southeast Region to Director, August 31, 1965):

> "Although a certain degree of effectiveness has been realized from the small mechanized crew units, under gradual development during the past 15 years, . . . the units continue to get hung-up in the rough rockland, bogged down in the muck, or mechanically broken down. As a result of these mishaps fire fighting in the glades, particularly at night, has often led to frustrating delays in suppression action, costly wasted effort, time-consuming retrieving missions, and grounded equipment pending repairs."

Airplanes have been used to scout fires and to map fires since 1949 (fire 4927). While dropping a message during fire 5013, a plane crashed, injuring the pilot and biologist passenger. Crop dusting planes were used to make water drops on fires 6222 and 6509 without definitive results. An aerial tanker was used for retardant drops on fires 6222, 6316, and 6317. The tanker was stationed at the Opa Locka Airport for about two years, but the operation was not considered successful. Helicopters, first used on fire 6201, are used to scout and map fires, to drop ignition devices, and to transport personnel and equipment.

Ignition Devices

Methods of igniting prescribed fires include the conventional drip torch, homemade longhandled ignitors for use from airboats and aerially dispensed ignitors. Napalm canisters tossed from a helicopter and incendiary shells fired from a 12-gauge shotgun have also been tried experimentally. The use of delayed action ignition devices (DAIDS) is generally preferred for reasons outlined by Wade et al. (1980). DAIDS were fabricated specifically for Everglades National Park conditions by the Southern Forest Fire Laboratory (Sackett 1975).

Fire Management Plan

Everglades National Park had a Fire Control Plan from 1956 until it was replaced by a Fire Management Plan in 1973. The Fire Control Plan defined areas to be protected and gave specifics on how to accomplish the task. It was revised periodically. The shift from fire control to fire management was brought about by an inability to control fire with heavy equipment, inability to reach some mangrove zone fires, work by Robertson (1953) indicating prescribed fire was needed, and a changed National Park Service philosophy (Kilgore, 1976).

Prescribed fire became a part of the Everglades fire picture in 1958 when use was approved for the pinelands ecosystem (see pinelands section p. 16). Prescription fires were begun in the sawgrass prairies in 1969 (Klukas 1973) (see prairies section p. 12). The University of Miami received a grant to assess the fire management

needs of Everglades National Park. The final report (Hofstetter 1973) contained numerous recommendations including:

- taking an inventory of biotic communities and determining status of each
- defining the nature of pinelands desired
- establishing a team devoted entirely to prescription burning
- expanding the fire-danger surveillance of the park and buffer perimeter
- making fuel, water level, and soil moisture measurements
- developing and maintaining a map with fire potential conditions
- establishing in advance where fires will be permitted to burn if started
- listing areas to be protected, and establishing methods of protection
- before drought, burning a mosaic of communities to break fuel levels and so reduce possibilities of a holocaust
- areas with a record of high fire frequencies should be burned under proper conditions rather than risk unexpected wildfires under poor conditions
- providing education for the public on fire ecology and prescribed burning
- burning pinelands in summer or early winter to simulate natural fires
- use backing fires, and random spot ignitions to simulate lightning, and permit a mosaic to develop
- staggering dates of burns
- burning pine areas on a 3-7 year interval
- do not attempt to achieve uniform plant conditions throughout the pinelands at any one time
- attempting to burn glades at 10-year intervals to control hardwood invasion
- attempting to prescribe burn the glades during months when natural fires would normally occur
- burning glades with spot fire rather than with long lines of strip fire.

Many of these recommendations have been adopted and are a part of the Fire Management Plan.

The Fire Management Plan is a subsection of the Resources Management Plan and defines the overall fire management objectives for a park area (NPS 18, 1979). It is revised annually. Objectives of the current Everglades prescribed fire program are to (Fire Management Plan, 1979):

- utilize prescribed burning to perpetuate fire subclimax communities where wildfires cannot penetrate the community

- use prescribed burning to control or manage exotic vegetation where feasible

- use prescribed burning for fuel reduction along park boundaries to prevent fires from leaving or entering the park

- use prescribed burning as an experimental tool to reclaim abandoned farmland

The plan identifies three management actions-suppression, containment, and observation (Fire Management Plan, 1979):

> Suppression is an aggressive attack on a fire, including all conventional means of fire suppression, except that vehicles will be kept on established roads or on the park boundary;
>
> Containment is the confinement of a wildfire to a predetermined area within a fire management unit or subunit;
>
> Observation fires are manned by a fire boss and a fire behavior officer and monitored on at least a daily basis.

These actions are based primarily upon soil moisture conditions and drought index (described by Keetch and Byram, 1968) incorporated in a drought condition report.

Soil moisture conditions determine whether organic soils will burn in hammocks.* Craighead (March 7, 1960 memorandum to Chief Ranger, Everglades National Park) felt moisture in the duff of hammocks may be the key to successful burns on Long Pine Key. Craighead (May 20, 1966 memorandum to Chief Ranger, Everglades National Park) stated hammocks with 67% or more soil moisture will not burn. He listed 13 hammocks that should be intensively protected from fire because of the rare plants growing in them. Craighead felt that too many hammocks had burned. Even though Robertson (1953) listed 10 hammocks requiring protection, the 1956 Fire Control Plan directed fires not be be fought in hammocks. If a fire could not be kept out of a hammock, it was felt best to burn around the hammock from a safe line to confine the fire to the hammock. The 1966 Fire Control Plan adhered to this policy, but added that time and manpower used in fighting fires within hammocks may be better used elsewhere. Now, however, all hammocks within the park are to be protected, when practical, by various techniques such as prescribed burning for fuel reduction, hose lays, and aerial firing during wildfires (Fire Management Plan, Everglades National Park, 1979). All fires burning near hammocks are to be closely monitored and action taken to prevent soil from burning. Sixteen hammocks are listed that require special attention, but the list contains only seven of the hammocks mentioned by Craighead (above).

*Hammock, as used in this paper, is the tropical hammock forest island stands composed of a variety of predominantly West Indian hardwoods which is the presumed climax vegetation on all sufficiently elevated sites in south Florida (Robertson, 1953).

Everglades National Park has been divided into three fire management units: Unit 1-coastal prairie/mangrove swamp/estuarine marsh, Unit 2-Everglades prairie, and Unit 3-pineland. Fire management actions for each unit are identified on a drought condition report (Fire Management Plan, 1979). Lightning-caused and human-caused fires are allowed to burn under predetermined fire prescriptions. Fires burning outside prescriptions, or not meeting management objectives, are contained or suppressed. All fires are to be contained within the predetermined fire management units, but under proper prescriptions may be allowed to cross boundaries. Prescribed fire may be used in those areas where natural fire has not occurred with the proper frequency. Each of the fire management units has had its own history and a review of these factors is important to understanding the unit.

Unit 1 - Coastal Prairie/Mangrove Swamp/Estuarine Marsh. The unit is comprised of an estimated 328,427 acres. The mangrove zone, 230,000 acres in size, is not a fire type, but the 75,427 acres of estuarine marshes and 23,000 acres of coastal prairie are considered fire type vegetation (Fire Management Plan, 1979). Fire is an important ecological factor in maintaining the ecotone, acting to check encroachment by Rhizophora and Laguncularia into adjacent herbaceous communities (Robertson 1956, letter to H. H. Bartlett). Craighead (1971) reported that frequent coastal prairie fires kept these areas free of invading Conocarpus. However, Werner (1977) believes occasional hard frosts are an effective hardwood control mechanism.

It has been a traditional policy ("house rule" in the words of Superintendent Beard, July 16, 1956, memorandum to Regional Director) not to suppress fires which burn within the mangrove line (Fire Control Plans, 1956-1966). Fires in the area have been difficult to reach until advent of helicopters. Only fires 4927, 6317, and 6507 show records of suppression attempts within the mangrove zone. The soft muck soils make walking difficult as illustrated by the following narrative report from fire 6317 for May 6, 1963, during the peak of a dry season:

> "Fire control aids and equipment were flown to Big Lostman's Bay to rendezvous with a Ranger in a boat from Everglades City. The fire fighting crew proceeded by boat through Rogers Creek. The boat was propelled by motor until extremely shallow water was encountered. The crew then propelled the 16' boat with push poles to a point from which they could proceed no farther. The crew then walked one mile over the burned area, sinking ankle deep to knee caps in soft muck. Deep footprints would partially fill with water."

Fires within the mangrove line are mostly caused by lightning, however, a few fires set by poachers of deer and alligator (4910, 4911 are examples) or by boaters/campers have occurred. Fire 4927, an incendiary fire, led to the decision to establish a patrol station at Lostman's River.

Lightning strikes in the mangroves kill a few trees resulting in a small circular opening in the forest. Such areas normally occur at infrequent intervals, however, 40 openings created at various times, were present within ¼ mile of the Everglades City Ranger Station on June 4, 1979. Lightning-caused fires in the saltmarshes can burn for three or four days, although the rate of spread is quite slow (W. B. Robertson letter to H. H. Bartlett, July 31, 1956). Fires 6507 and 7918 which burned 1,280 and 1,392 acres respectively, are examples. Most fires burn up to a few hundred acres on the day they start and go out over night.

Even though fires within the mangrove line have been difficult to reach and almost impossible to do anything about once located, the Regional Director, Southeast Region, was sent a memorandum by the Assistant Director, Operations, Washington Office, critical of the failure to take immediate and aggressive action on the June 24, 1965 East Rogers Fire, fire 6507. In a long critical letter, the Regional Director was directed to take prompt and aggressive suppression action on all nonprescribed fires (Assistant Director, Operations, Washington D.C. letter to Regional Director, Southeast Region dated August 23, 1965). The letter demonstrated that the Washington office was backing the Fire Management Policy in effect at that time, but the response from the Acting Assistant Regional Director, Southeast Region, to the Director (letter dated August 31, 1965) showed that realities in the field were not conducive to total aggressive suppression. The response pointed out difficulties in fighting glade fires, problems of fuel accumulation as a result of partial fire exclusion since the advent of park protection, drying-up of the glades due to drainage, and argued for recognition of wildfire in its natural season as being benign and not destructive to the grassland ecology. Discussions of this type undoubtedly sped the change in National Park Service policy from fire suppression to fire management.

Prescribed burns (fires 7319 and 7705) set for research documentation in the Broad River area have been described by Werner (1977) and Taylor (1979). Prescribed fires set for control of the exotic Australian pine (Casuarina equisetifolia) in Unit I are listed in Appendix II. Three prescribed fires were set in an attempt to improve habitat of the Cape Sable Seaside Sparrow in the Spartina marshes near Fox Lakes (Fires 7241, 7363, and 7405).

Unit 2 - Everglades Prairie. The everglades prairies are a large, shallow, freshwater area with numerous tree islands. The Fire Management Plan (1973-1979) has the prairies divided into the Shark River Slough (dominated by sawgrass strands, spikerush communities, and hardwood hammocks and bayheads; 91,520 acres), high prairie (dominated by muhly grass, Muhlenbergia filipes; 58,560 acres), and low prairie (dominated by sawgrass; 206,731 acres), all of which are major fire types.

Sawgrass strands are scattered throughout the Shark River Slough. Historically, the strands burned due to individual lightning strikes, for example fire 7804, or during extreme drought when large, several thousand acre fires have occurred. Examples are the Shark Valley fire (6222) that burned a total of 184,544 acres, the Binky fire (7428) that burned 63,727 acres, and the Gator Den fire (7436) that burned 13,005 acres. See p. 13 for additional examples. Approval was sought (Klukas, November 27, 1967 memorandum to Superintendent, and Superintendent December 20, 1967 memorandum to Regional Director, Southeast Region) for control burn experiments in coastal grasslands "to restore stagnant grasslands and to determine use of fire in controlling the exotic Australian pine." Use of fire in the glades began in 1969 to determine effects of fire on marsh prairie. The program was expanded in 1971 to include fuel hazard reduction in the Shark River Slough when 5,500 acres of sawgrass were burned (Klukas 1971). Recommendations for burning during the natural (lightning-caused) fire season (Hofstetter 1973, see p. 9 of this report) or very early in the dry season (Fire Management Plan, 1979) have been poorly followed by fire managers. Twenty-two prescribed fires were attempted in sawgrass strands, and only one, fire 7917, occurred during the summer wet season when natural fires occur (Appendix II). Four strands were burned in October during the early dry season, and the remainder were burned from late November through April.

Many sawgrass strands were in apparent "poor health" from 1972 through 1976. Alexander and Crook (1974) and Hofstetter (1974) felt that deterioration was due to the exclusion of fire. Hofstetter and Parsons (1975) pointed out that factors such as high salt levels, insect feeding, fungal infection, and nutrition imbalance could also have contributed to the condition. Lugo, et al. (1971) found sawgrass responds favorably on fire cycles of 8-10 years. Hofstetter (1974) felt that a 10-year burning interval would allow sawgrass condition to deteriorate in Shark Slough, and he suggested burning sawgrass communities on a 2-5 year cycle. Since the Shark Valley sawgrass strands had not burned in 12 years they were considered past their optimum fire cycle and several sawgrass strands were burned from 1973 through 1975 (see Apprendix II for a list). Results from this experimental study (Werner 1975) were inconclusive as to the effect of fire. By winter of 1977-1978 sawgrass condition had improved to normal in both burned and unburned plots (observation by this author).

High and low prairie units are areas where large, fast-moving fires are common (Appendix I). Fires that burned more than 10,000 acres include 6222, 7428, and 7436 listed above and 5012 (24,000 a.), 5019* (60,000 a.), 5117 (30,720 a.), 7115* (43,150 a.), 7431* (35,000 a.), 7523 (32,920 a.), 7529 (28,286 a.). Fires of 5,000 to 10,000 acres are common in these communities, and several fires of 500 to 5,000 acres in size may occur during a given year (Appendix I).

Prescribed fires have been set in high and low prairies for the following reasons (Fire Management Plan 1979):

1. Reduce heavy fuel accumulation around certain hammocks.

The use of prescribed fire around seven hammocks is scheduled for fuel hazard reduction (Fire Management Plans 1974-1979). The hammocks are Paradise Hammock, Otter Cave Hammock, Hammock #55, Binky Hammock, Cactus Mound, Large Hammock below Binky, and Mahagony Hammock because they are the largest and most diverse, or contain archaeological sites (Klukas, December 28, 1970 memorandum to Superintendent).

In 1972 a program to begin a continuing 3-year cycle of fuel reduction around the hammocks was recommended with fires to be set during the lightning season from May to October (Bancroft July 28, 1972 memorandum). The 1979 Fire Management Plan shows eight fires to have occurred around the seven hammocks, but none were set during the lightning season. Dates these fires occurred as given in the Fire Management Plan do not match with any prescribed fire records in the vicinity. However, fires 7306, 7327, 7422 correspond to boundary burns, and 7436 and 7428 correspond to large wildfires near or within the hammocks. No record is available for the March 25, 1976 fire shown to have occurred at Otter Cave. The 1979 Fire Management Plan shows the seven hammock environs to be on a two to four-year fuel reduction burning cycle.

2. Institute a fuel management program along the park boundary to prevent fires from leaving the park and unwanted fires from entering the park.

Boundary burns are conducted on 59 miles of boundary on the east, north, and west sides of the park to prevent fires from entering or leaving the park. To date, 22 fires have crossed the park boundary, burning a total of 360,217

acres (Table 1). Most fires that have crossed the boundary have been man-caused (86%) and most of the acreage burned by these fires has been due to man-caused fires (98%) (Table 1). Years of highest acreage burned by fires crossing the boundary were 1962, 1974, and 1975. Prescribed boundary burns, summarized through 1979 (Appendix II), include 14 burns on the east boundary, four on the north boundary and 11 on the west boundary. No prescribed boundary burns are recorded as having been conducted during the summer wet season. Some boundary burns are large, for example, fire 7422 burned 8,500 acres, and fires 7309, 7401, and 7719 were all larger than 1,000 acres. Fire 7719 burned 3,877 acres during one afternoon.

Boundary burning began in 1971 following a discussion of methods to reduce fire hazard from an impending drought, so as to reduce damage such as occurred during the 1962 Shark Valley fire (fire 6222) (Peterson, December 7, 1970 memorandum to Superintendent). On December 21, 1970, the first experimental burn was conducted ½ mile west of the Shark Valley Tower (Klukas, December 28, 1970 memorandum to Superintendent). The fire burned 120 acres and went out over night. (No other record of this fire was located). Based on this fire, it was concluded that it is safe to conduct control burns in flooded sawgrass areas during the winter period of long cool nights in December, January and February. Klukas recommended a "black line" from the Lostman's River headwaters boundary area to the Ten Mile Corner and then northward to the Tamiami Trail, south from L-67 to below the Aerojet plant, burning out of sawgrass strands from L-67 to the Shark River headwaters, and a blackline in an area in lower Taylor Slough below the big bend in the old Ingraham Highway. With the exception of the lower Taylor Slough burn, all recommendations continue to be followed. In addition, the north boundary, including the Miccosukee Strip, is burned. The 1979 Fire Management Plan recommends boundary burning be done annually, by aerially ignited spot fires, to create a fuel mosaic.

3. Continue research burns in plant communities to further expand our knowledge of fire and its effects.

Effects of fire on prairie ecosystems has been studied since 1971 (Hofstetter, 1973, 1974; and Hofstetter and Parsons, 1975). Studies designed to measure the effect of frequency and season of boundary burns on high prairie were begun in 1979 and are detailed in Appendix C of the 1979 Fire Management Plan as well as the 1979 Annual Research Plan for Everglades National Park.

Unit 3 - Pinelands. The south Florida slash pine, Pinus elliottii var. densa, once occupied an extensive area along a limestone ridge on the southeastern coast of Florida. Housing and other developments have almost totally destroyed all but the small remnant of 19,840 acres of second growth pine inside Everglades National Park on Long Pine Key. The pineland is a plant association unique to southern Florida (Craighead, July, 1956 letter to Regional Director, Region One). An estimated 40 endemic herbaceous species occur in the understory. Without periodic fire, the pineland would become a hardwood forest in 15-25 years (Robertson 1953) and most of the endemic plants would be lost. The forest contains approximately 125 tropical hardwood hammocks.

Work by Robertson (1953) in this plant community, stimulated development of the first prescribed fire program in the National Park Service. Before prescribed fire

as allowed, Beard (July 11, 1956 memorandum to Regional Director, Region One) escribed the Everglades as:

> "being in an intransigent situation wherein our protection job is creating unnatural conditions . . . Dr. Robertson's studies point out the fact that hammock vegetation is rapidly dominating the rockland areas because we are preventing fires there. Since time immemorial, this type of country has supported pineland with scattered hammocks.
>
> "Our experiences with fires on Long Pine Key show that direct attack is usually futile---I would say 'impossible' once the fire gains headway under good burning conditions. So, we have cut fire lines with bulldozers and burned-out or backfired to limit the spread of conflagrations.
>
> "We have done rather well of late and extensive areas of Long Pine Key have not burned in many years. The eastern section of this key appears to have escaped fire for at least ten years. As a result, broad leafed hammock vegetation has spread, especially along all northerly or pinnacle rock and wetter sections. In some places it is now a solid mass of understory averaging twenty feet in height.
>
> "One of the great dangers seems to be that if a fire occurs in places it will be a calamitous one, perhaps killing pine as well as understory. It would seem that once the hammock is dominant, fire danger would be much less because hammocks are relatively fire proof."

Superintendent Beard again petitioned the Regional Director in November, 1956 (memorandum of November 14, 1956) and discussed the importance of fire in the Everglades ecosystems. He stated it was evident that the advance of hardwood succession will ultimately result in the extinction of south Florida slash pine and other endemic species of pineland plants, and result in the loss to the park of many land birds and other animals found only in the pine forest habitat. He felt it extremely important that Long Pine Key be protected as pineland. Beard felt the fire control policy was the chief threat to the pine forest and that alternatives were crystal clear. The Regional Forester, Region One responded (memorandum December 10, 1956 to Regional Director, Region One) to the memorandum with three alternatives:

1. Continue efforts to exclude fire in accordance with established Service policy.

2. Permit fires of lightning origin to burn on Long Pine Key.

3. Substitute controlled burning for lightning fires as a quasi-natural means of maintaining the forest type.

These alternatives were sent to the Director (memorandum from Regional Director, Region One to Director, December 13, 1956) with support expressed for alternative 3. The Director authorized preparation of a specific management plan to carry out the proposed prescribed burning plan (memorandum from Director to Regional Director, Region One, December 18, 1956). The program, at the start, was to be restricted to the smallest area of the park to maintain a representative

sample of the pine type. Approval by the Director was required and interested conservationists were to be informed. A prescribed burning plan for Long Pine Key was completed in June 1957 (memorandum from Superintendent to Regional Director June 21, 1957). Objectives of the plan were stated as follows:

> "The nature of the problem has been set forth in several communications from this office including, in particular our memorandum of November 14, 1956, to you. We wish to clarify and stress one point with regard to the plan's objective.
>
> "We feel that our earlier comments may have unduly emphasized preservation of the pine type per se. As we see it, the true objective of the plan and its only justification is preservation of natural landscape in the Long Pine Key area; that is, a tract of open pine woods embracing tropical hardwood hammocks and areas of everglades vegetation. It would, of course, be a relatively simple matter to maintain a few relict areas of pineland by burning, but this seems to dodge the problem. The plan proposes to maintain a natural landscape of which pineland is an integral part, rather than a pineland museum."

The plan proposed eleven burning blocks, A-K which remain today. No burning was proposed for blocks D and K, but future burns were proposed for K to make the Pine Island residential area more habitable. The proposal called for one round of burning with careful evaluation of results and methods used to justify a continuation of the program. Burning was to be done into the wind (backfires), with severe burning conditions used (head fires burning with the wind) where hardwood succession was more advanced. Hammocks were to be protected. Dry season headfires were rejected as a means of obtaining the objective because of potential damage to hammocks, and possibly to pines. Wildfires were to be controlled, but summer wildfires would be permitted to spread. All available information suggested that summer (June-August) was the best time to burn, but for budget and personnel reasons an earlier burning period was chosen. (Seasonal employees would have to be held over into the summer if summer burns were conducted). The proposal was approved by the Service Director on October 9, 1957, with the exception that block K was to be removed from the plan as burning there was to make the area more habitable for residents rather than maintain a pine landscape. A proposal specific for block K was requested.

During 1957, 20 miles of roads were constructed on Long Pine Key (memorandum from Superintendent to Regional Director, Region One dated January 6, 1958). Block B was burned April 25, 1958, representing the first prescribed fire in a national park area, an historical landmark in National Park Service fire management.

No evidence was found to indicate that a plan was developed for block K, the Pine Island block. Apparently block K included what is now blocks K-Y, in the Pine Island area. Blocks R and S were burned as early as 1962, and T, V and W by 1968. Appendix II summarizes burns for the Pine Island pine blocks, Long Pine Key pine blocks and other pineland areas.

Between 1958 and 1973 (15 years) 49 prescribed fires were set in pine blocks A-Y (Appendix II). The remaining 52 prescribed fires were set between 1973 through 1979 (7 years). Thirteen fires (13%) were set from June through September. Eight

of the thirteen summer burns were 30 acres or less in size, and only two, fires 7561 (503 acres) and 7125 (690 acres) were over 500 acres. Hofstetter (1973, see p. 9) recommended burning pinelands in summer or early winter. However, the Fire Management Plans for 1973 and 1974, which incorporate most of Hofstetter's recommendations state, "burning in pine areas will be accomplished between October and January after the passage of a cold front. Summer prescription burning will be kept to a minimum because of possibility of disturbance to animal reproduction." Time of year restrictions for burning were removed from Fire Management Plans beginning in 1976.

The original prescribed burning plan (see p. 16) recommended burning be done into the wind, with severe burning by headfires used where hardwood succession was more advanced. Craighead (March 4, 1960 memorandum to the Chief Ranger) and Hofstetter (1973, see p. 9) also recommended backing fires. Robertson's 1968 Annual Progress Report (RSP: EVER-N-3, 1968) concludes that light backing fires develop sufficient heat to kill most hardwoods up to 3/4 inch basal stem diameter, but backing fires were considered impractical for large areas because of the time required. Short-running head fire was recommended as the best burning method. Records, although not complete, indicate backing fires were used on some early fires, but almost all pineland prescribed fires from 1973-1978 were fires that burned with the wind (strip head fires). Head fires have been the method of choice because hardwood succession was advanced and more intense fire was necessary to penetrate vegetation, and because the burns could be completed in less time than it takes for backing fires. Backing fires were used on most 1979 prescribed pineland fires.

The original objective for prescribed fire in the pinelands (see p. 16) was preservation of the natural landscape in Long Pine Key. Fire Management Plans for 1975-79 have as a management objective reclamation of the pinelands from hardwood advancement. These plans give dates pinelands have been burned and plans for future burns to complete reclamation. Reclaimed pinelands are to be burned every 4-7 years to control hardwood invasion and to facilitate pine regeneration. However, reclamation is not defined. Hofstetter (1973) recommends defining the nature of pinelands desired from results of prescribed burning.

REVIEW OF FIRE RECORDS FOR EVERGLADES NATIONAL PARK

Fires Outside the Park

Fire records reveal that much of the park's fire fighting energy and time has been consumed by fires outside Everglades National Park. A cooperative agreement has been in existence from 1948 through 1979 detailing the park's responsibility in fighting fires in the Everglades Fire Protection Zone, an area not more than 12 miles from the nearest park boundary. Records reveal that 251 fires burned 480,080 acres in the Everglades Fire Protection Zone (Table 3). This constitutes 28% of the individual fire reports and 52% of all acreage burned. Fire Protection Zone records have been separated from Everglades National Park records to give a better picture of acreage burned within the park (Fig. 1), and to give a more accurate ratio of man-caused versus lightning-caused fires within the park boundary (Tables 2 and 3). Almost all fire starts within the Everglades Fire Protection Zone were attributed to activities of man. Beginning with the 1975 agreement, fire suppression responsibilities for the Everglades Fire Protection Zone were transferred to Dade County and the Florida Division of Forestry.

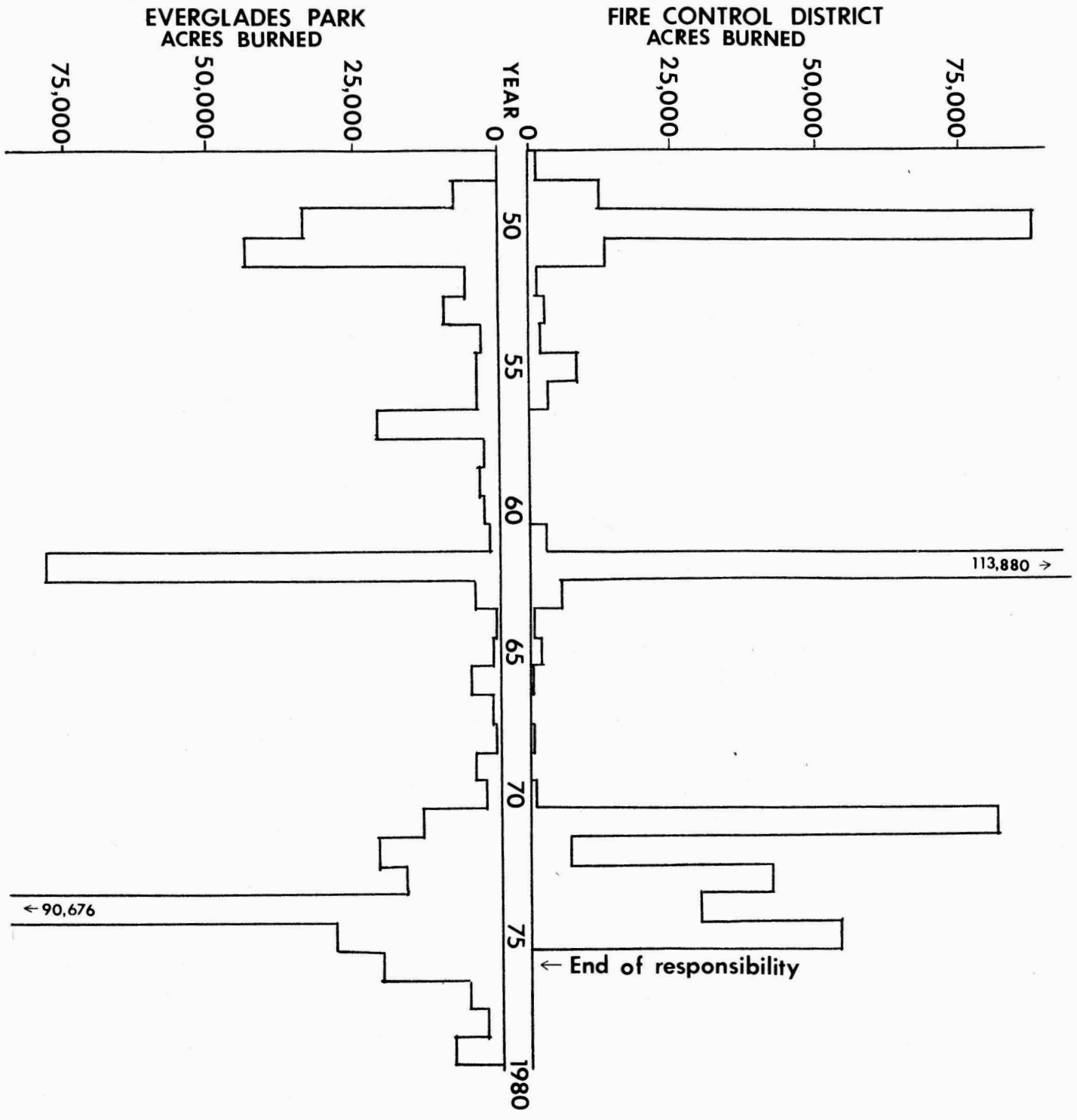


Figure 1. Acreage burned each year in the Everglades Fire Protection Zone and Everglades National Park.

Everglades National Park responds to fires in the area only when assistance is requested. Points of origin of all fires in the records have been mapped (see insert).

For this report, Everglades National Park fire records have been divided into lightning-caused, man-caused, and prescribed management fires.

Lightning-caused fires. The number of lightning fires and monthly distribution of stikes has important implications for restoration of natural fire to the ecosystem. Robertson (1953, see p. 112 Appendix III) stated that until the early 1950's there was a strong belief that lightning fires did not occur in south Florida, and he quoted several authors who felt natural fire was rare or absent.

Records show the number of lightning fires may be in proportion to the effort spent in finding them. High numbers recorded for 1972, 1973 and 1974 are due in part to helicopter surveys and to increased ground level surveillance (Table 2). From 1972-1974, 58 lightning strikes were recorded compared to 8 from 1952-1954 and 10 from 1962-1964. These data infer that lightning fires have been underestimated, especially for early years of park records, and that minimal acreage burned by lightning has been recorded. Table 2 shows that the change in percentage of fires attributed to lightning has changed with time.

Lightning fires account for 28% of all recorded fires and 18% of all acreage burned (Table 3). No lightning fires were recorded during 1948, 1950, and 1969, but during an average year 2,540 acres can be expected to burn as a result of lightning strikes. During 1951, nine lightning-caused fires burned 43,155 acres which constitutes 53% of acreage burned due to lightning and 10% of all acreage burned for the period of record. The lightning fire season is May through August when 87% of all lightning-caused fires occur (Table 4). Lightning-caused fires have been recorded for all months but January and February. June is the month when most acreage burns (77.2%), and the month when largest lightning-caused fires occur (Table 4). Muck and hammock soil fires were caused by lightning during four months of the year (Tables 7 and 8). Most muck and hammock soil fires caused by lightning occurred during 1951 when large acreages burned under dry conditions.

Man-caused fires. Man-caused fires have been important in the Everglades since records have been kept (Table 2 and Appendix I). Fires have been set by poachers to improve both access for man and habitat for deer and alligators; by careless actions of visitors and residents; and during lumbering, farming, and construction operations. Comparisons are made in the kinds of man-caused fires for five year periods from 1950 through 1979 (Table 5). Cause of fire has fluctuated considerably through time. Fewer fires have been caused by smoking during the past decade, but this statistic may simply have reflected a change in recording methods for cause (Table 5). Point of origin for all man-caused fires has been mapped (see insert).

Man-caused fires accounted for 36% of all fires and 62% of acreage burned in Everglades National Park (Table 2). Man-caused fires have occurred every month of the year; however, fires during July and September have typically burned few acres (Table 6). The man-caused fire season is generally from November through May, with January through May being months when most fires occur (76%) and when most acres burn (96%). The largest average size fire and most acreage

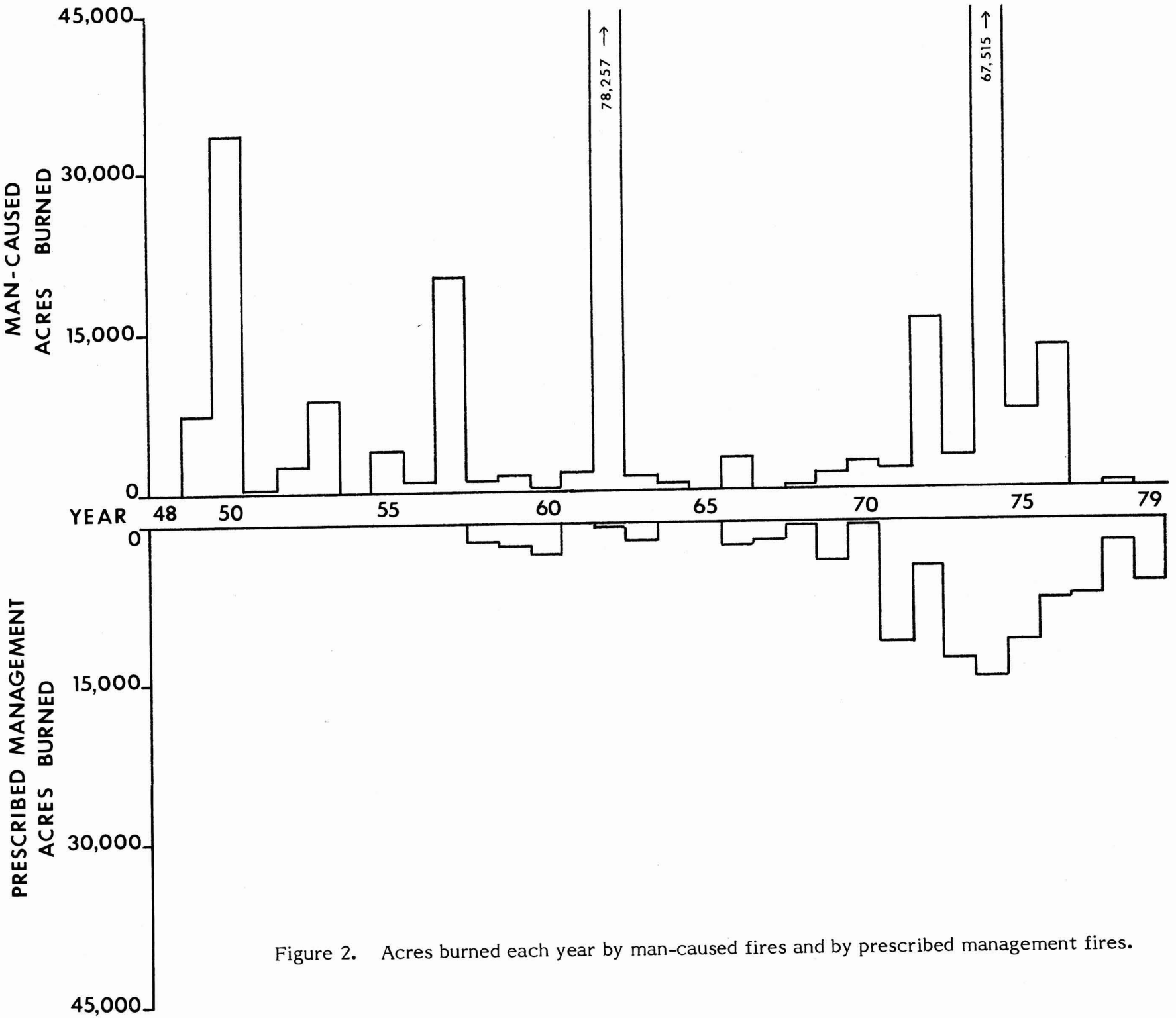


Figure 2. Acres burned each year by man-caused fires and by prescribed management fires.

burned (46%) occurred during May (Table 6). Man-caused fires are important in causing muck fires from February through May. Hammocks burned from man-caused fires December through June (Table 7 and 8). Man-caused fires in areas around campgrounds and high visitor use locations are undoubtedly reduced by prescribed fire because fuel levels are lowered. However, the total acreage burned by man-caused fires appears to be unaffected by prescribed fire (Fig. 2).

Prescribed management fires. Prescribed management fires have been set to control Australian Pine, to improve Cape Sable Sparrow habitat, to reduce fuel on park boundaries, to control hardwoods in pinelands, for vista clearing, and for experimental purposes such as determining effect of fire on sawgrass and Muhlenbergia plant communities. These aspects have been discussed (p. 12 to 14) and will not be reiterated here. Records for areas burned routinely are listed in Appendix II.

Prescribed management fires were first set in 1958. Since then, 246 known prescribed fires have been set, burning 89,167 acres. These totals account for 36% of all fires and 20% of all acreage burned (Table 2). Average size of a prescribed management fire was 362 acres. Most fires (88%) have been set from October through April, burning 95% of acreage burned by prescribed fire. March, January, and December, are months when highest acreages have been burned (Table 9).

The difference between months when prescribed fires have taken place and months when lightning fires occur is striking (Fig. 3; Tables 4 and 9). The data show that prescribed fires have been set at times when few lightning-caused fires occur. Recommendations for burning during the summer wet season have been listed (p. 9), and some reasons why these recommendations have not been followed are discussed (p. 17). In addition, some early attempts to set summer fires apparently were unsuccessful. More recently, attempts to conduct prescribed burns during the summer wet season have been successful, for example, fires 7812, 7915, and 7917; and more attention is now being given the practice (Taylor 1980).

Prescribed fires have been important in causing muck and hammock soil fires from December through April (Tables 7 and 8). Prescribed fires were a major cause of muck and hammock soil fires that occurred from 1971 through 1979 (Table 7 and 8 and Fig. 4). Prescribed fires have had a sudden impact on the Everglades with 90% of all prescribed fires and 85% of all acreage burned having occurred in the past 10 years (Table 2).

IMPACT OF WATER LEVELS AND PRECIPITATION ON FIRES

Several factors that could have affected the south Florida fire regime have been considered. Lightning fires have been shown to occur almost exclusively during the wet season, are usually fairly small in size, and only occasionally cause muck or hammock soil fires (Tables 7 and 8). The exception was June 1951 when the wet season was late in arriving, water levels were low, and several lightning-caused fires burned 43,155 acres. This exception in modern records may have been the rule in pre-man times in south Florida when lightning was the only (or the major) ignition source. Lightning fires are not now a management problem in Everglades National Park, and will not be considered further.

Man-caused fires are a management problem in that they occur during the dry season, have the potential for becoming large, burn across boundaries (Table 1),

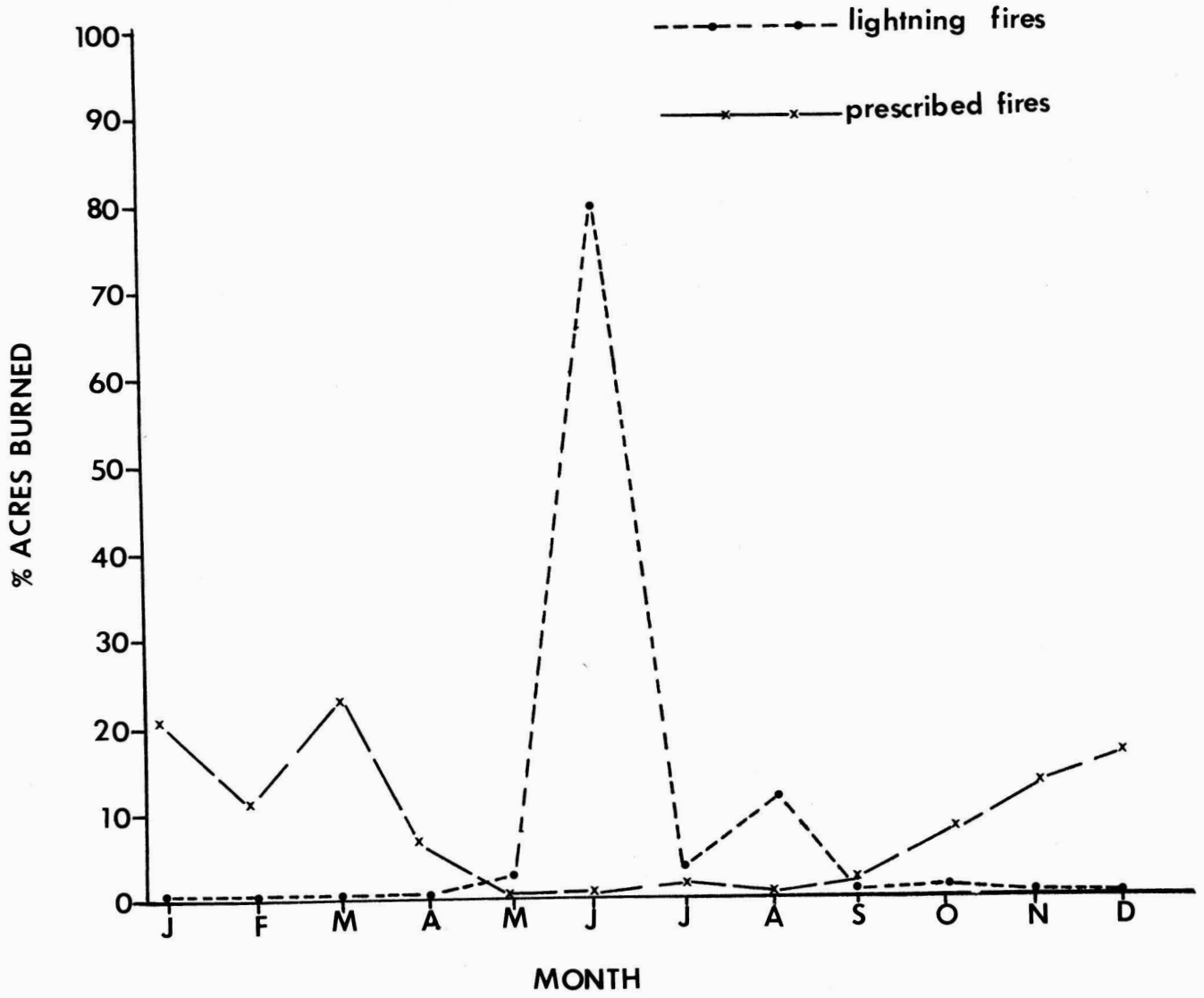


Figure 3. Percent of acres burned each month by prescribed fire and by lightning fire in Everglades National Park.

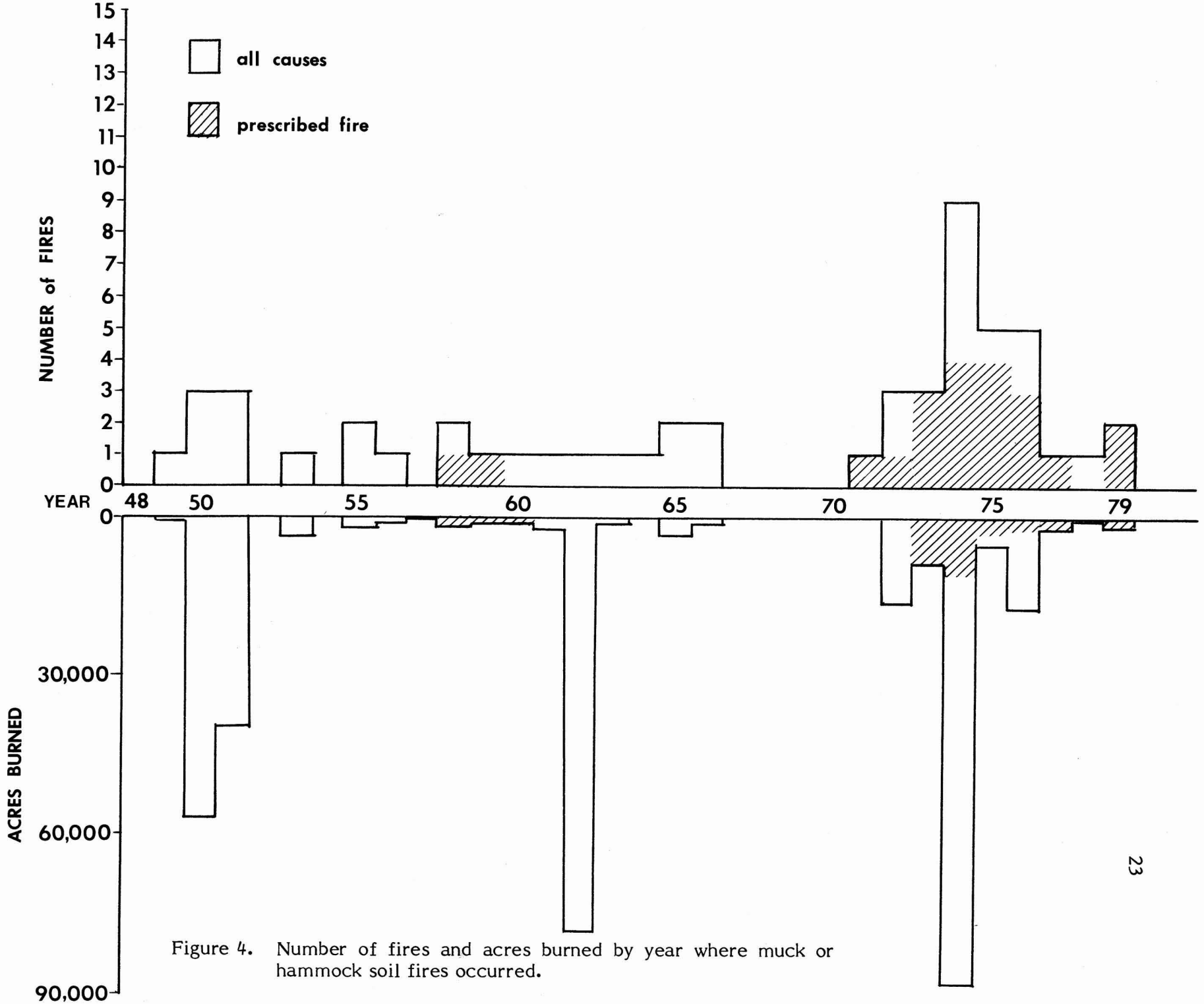


Figure 4. Number of fires and acres burned by year where muck or hammock soil fires occurred.

may prepare a seedbed for exotics, and frequently cause muck and hammock soil fires (Tables 7 and 8). In an attempt to isolate under what conditions most man-caused fires occur, a linear regression model was constructed that showed correlation between several factors and the number of fires or acres burned (Table 10).

High numbers of park visitors have little impact on the number of man-caused fires or on acres burned (Table 10). Official travel statistics show a minimum visitation of 94,927 park visitors in 1949 and a maximum of 1,773,302 in 1972. Average visitation was 747,992 persons per year. Low correlations resulted between numbers of visitors and numbers of fires, and between numbers of visitors and acres burned by man-caused fires. These data indicate ecological conditions are more important than numbers of people. Many woods-burners are probably local citizens who have historically set fires. Doolittle and Lightsey (1979) describe active woods-burners in southern states as young, white males whose activities are supported by their peers. They state an older, less active group has probably retired from active participation but act as patriarchs of the burning community.

Total number of fires and total acres burned, which include lightning, man-caused, and prescribed fires, showed low correlations with water levels and with precipitation (Table 10). Poor correlations occurred between the number of acres burned and all factors tested (Table 10), apparently because number of acres burned is influenced by winds, relative humidity, short-term weather patterns, roads, canals, and other factors.

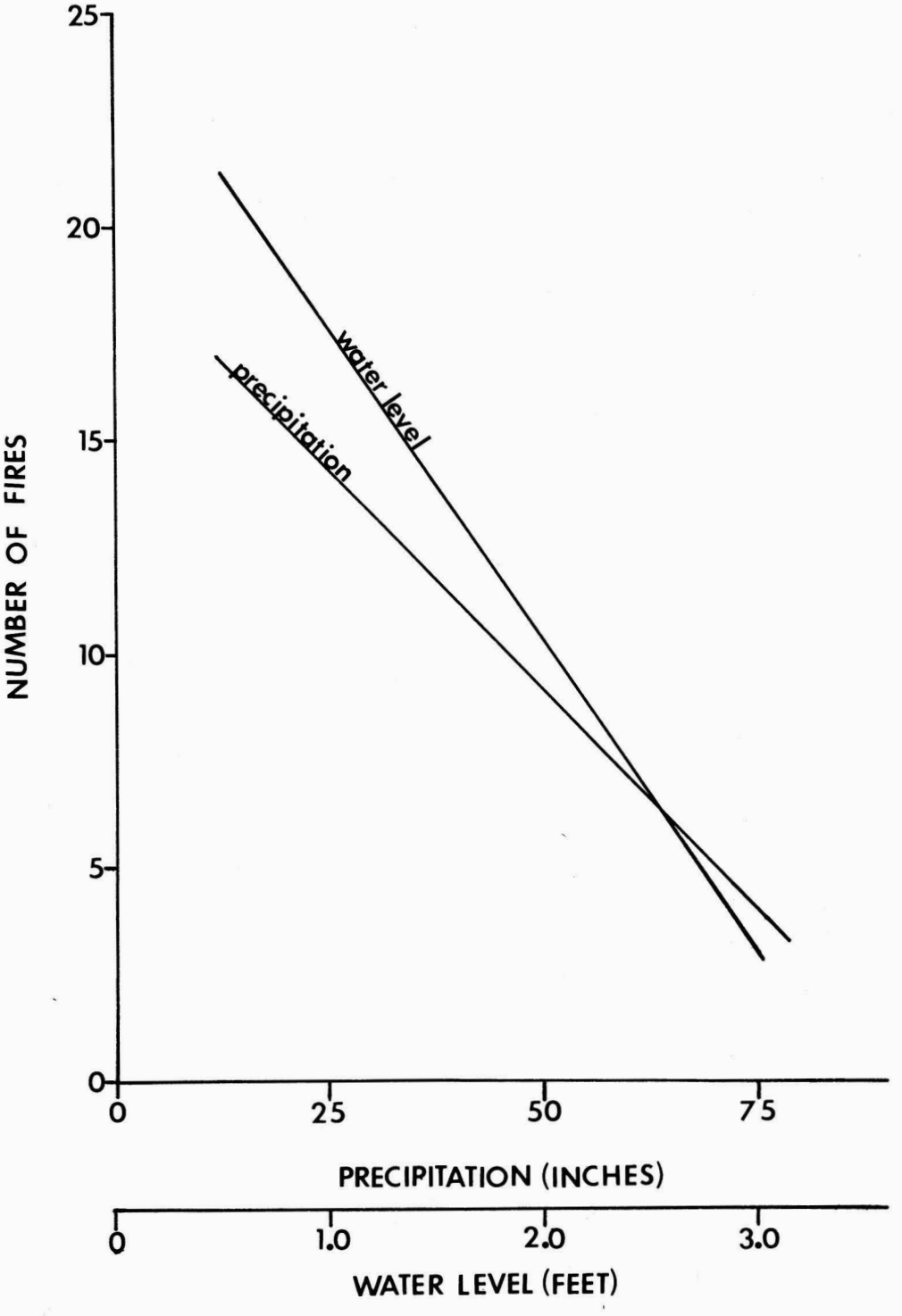
Highest correlations occurred between water levels and number of man-caused fires, and between precipitation and number of fires. Correlations for June through May were higher than for the calendar year (Table 10). June through May corresponds to the hydrologic year, approximately from the beginning of one rainy season to the beginning of the next. Robertson (1953) pointed out that data based on the hydrologic year gives a much clearer picture of fire danger than does the calendar year.

Regression equations, based on hydrologic year precipitation at Royal Palm or water levels at Taylor Slough Bridge, were used to estimate numbers of man-caused fires (Table 11 and Fig. 5). Estimated values did not differ significantly from observed values (Table 11), thus, numbers of fires in future years can be predicted under given hydrologic conditions, and past fire numbers can be estimated.

In order to document fire frequency, records of fires are needed, but our data only goes back to 1948. Precipitation records for Royal Palm date to 1952 and water level records for Taylor Slough Bridge began in 1962. A longer record dating to 1934 was found for a United States Geological Survey maintained well, S-196, located near Homestead (T 56S, R 38E, SW¼ SE¼ sec. 35). Water levels at S-196 and Taylor Slough Bridge were found to be highly correlated ($r = .912$ for 1962 to 1978; $r = .946$ for 1962 to 1969; $r = .906$ for 1970 to 1978).

Because of the high correlation of S-196 with Taylor Slough Bridge water levels, the S-196 data was used to develop another equation and the number of man-caused fires were estimated from 1934 through 1979, extending the record by 15 years (Table 11). Resulting estimates were not significantly different from

Figure 5. Relationship of June-May water levels (feet mean sea level) at Taylor Slough Bridge and June-May precipitation (inches) at Royal Palm to number of man-caused fires.



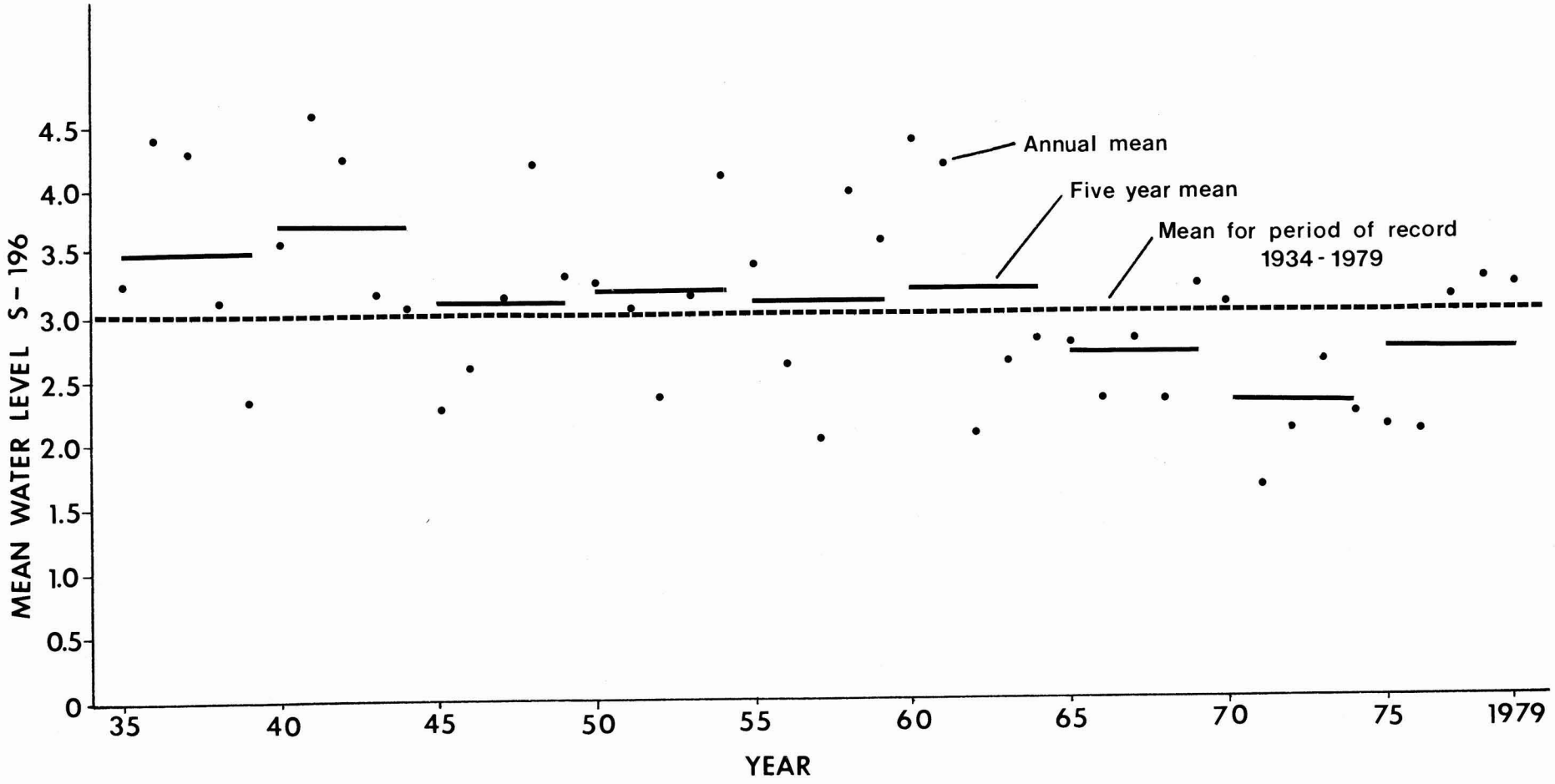


Figure 6. Water levels at S-196. Period of record is 1934 through 1979.

observed number of man-caused fires for 1948 through 1979 (Table 11), but the model based on S-196 data gives a poorer fit than precipitation at Royal or water level at Taylor Slough Bridge.

Even though number of fires estimated by S-196 regression and observed number do not differ statistically, examination of the data reveal an unusual number of "no-fire year" from 1934 through 1961, implying water levels must have been higher during that time (Table 11).

The water level at well S-196 was lowered in 1962 by construction of levee 29 and associated S-structures which were completed in December 1962 (Rosendahl, 1980, personal communication). No other major canal construction occurred during this time period. Mean water level changes at S-196 are shown on Fig. 6. Even though precipitation for the 1962 hydrologic year was the lowest on record, annual mean water levels and five-year mean water levels are consistently lower following 1960 than they were during the earlier period of record (Fig. 6). Construction of levee 29 stopped sheet flow to the south toward well S-196. Point releases through S-structures have been required by congressional mandate since 1970 (Rosendahl, 1980, personal communication), but they apparently do not substitute for sheet flow, and water levels at S-196 generally remain below average (Fig. 6).

Canal and levee L-31(N) and L-31(W) were completed in 1967 and 1968 respectively. L-31(W) is between Taylor Slough Bridge and well S-196. The canal must have affected both areas in a similar manner as correlations between the two areas remained about the same before and after construction. Rose, et al., (in press) analyzed effects of L-31(W) on water levels at Taylor Slough Bridge. They show mean annual discharge through the bridge was reduced by 40% following canal construction. Number of "no flow" days increased from 167 days to 191 days. Surface water conditions declined 20% during the wet season, and lower monthly extremes were noted following canal construction. Rainfall did not change between 1960-1968 and 1969-1978 (Rose, et al., in press).

The impact of lowered water levels on number of fires and acreage burned is difficult to assess. There has not been a dramatic increase in number of extreme fire years (Tables 2). Mean number of acres burned by all fires (Fig. 8) and by man-caused fires (Fig. 7) on an annual and 5-year basis do not reveal an increase in acres burned. Part of the problem may be the high acreage burned by prescribed fire from 1971 through 1977 which may have masked any change (Table 2 and Fig. 2).

A shorter hydroperiod and reduced water levels would allow more fires to occur each month, and would permit more fires to burn at the transition from dry to wet or wet to dry seasons. Rose et al., (in press) report highest mean water level was during October before construction of L-31(W). After L-31(W) canal construction, highest water level was during September, with the October mean showing a decrease of 0.58 feet. November water level decreased 0.69 feet compared to pre-construction. The greatest overall decrease however, occurred during June, when mean surface water levels were decreased by 1.03 feet. Overland sheet flow, reduced from 80% of the time to 59% of the time, and lowered water levels, which occurred every month except April and May (when water levels are already below the soil surface) would allow more fires to burn more acres each month of the year.

FIRE FREQUENCY

Fire frequency was estimated by attempting to determine periods between extreme fire years and periods between moderate fire years. An extreme fire year was defined as a year when, before fire records, fire conditions received considerable discussion in the popular press, or when fire records showed unusually large numbers of fires and/or acres burned (20,000 to 100,000 acres).

Frequency between extreme fire years was estimated from several sources. (1) A list of extreme years from 1910 to 1953 was gleaned from newspaper accounts (Robertson, 1953; see Table 12); (2) The total number of acres burned each year in Everglades National Park from 1948 through 1979 (Table 2); (3) The number of fires that burned each year in Everglades National Park from 1948 through 1979 (Table 2); (4) A regression equation, based on the relationship of man-caused fires to water levels and precipitation, was used to estimate number of fires from 1933 to 1947 (Table 11, Fig. 5); (5) By counting the number of years when the annual mean acreage burned by man-caused fires, and the annual mean total acres burned exceeded the five-year mean that had exceeded the mean for the period of record (Figs. 7 and 8). These methods resulted in an estimated 5.8 to 7.5 years between extreme fire years.

Moderate fire frequency was estimated by counting the number of years when total acres burned exceeded the mean for the period of record or when 10,000 to 20,000 acres burned. A moderate fire season will occur every 3.3 years if total acres burned are used in the calculations, or 4.3 years if only number of man-caused fires is used (Table 2). Moderate fire frequency estimated from total acres burned is higher due to the influence of prescribed management fires.

Unfortunately, fire records do not serve as a measure for fire impact. Fires that occur during the wet season are usually benign, and are usually caused by lightning. Dry season fires, on the other hand are mostly man-caused. They often destroy hammocks and organic soil while burning large acreages. With lowered water levels, fires now have the potential of being more consumptive of soils and hammocks than did fires before drainage. As early as 1953, Robertson (1953) stated restoration of water levels on the glades would change the necessities of fire control, and should bring about a situation in which only areas of special interest need be guarded from fire.

As a poor alternative to restoration of water levels, prescribed management fires have been used to break up fuel continuity and to burn around areas needing protection when burning conditions are less severe. Use of winter prescribed management fires may be counter-productive, however, as they may encourage invasion by the exotic Schinus (Taylor, 1980).

By experience, it is now known that prescribed fires can be set in the summer wet season, thereby, avoiding muck and hammock soil fires and preparation of a seed-bed for exotics. It would appear that without restoration of historic water levels prescribed management fires will continue to be required to prevent unnatural impact from winter man-caused fires.

SUMMARY

Thirty-two years of fire records for Everglades National Park, from 1948 through 1979, form the basis for this report. The records contain 913 fire reports of which 682 reports cover 451,082 burned acres in Everglades National Park, and 251 reports cover 480,080 burned acres in the Everglades Fire Protection Zone outside the park. A listing of all recorded fires giving date, locations, size, and cause is given. Park records and Fire Protection Zone records are separated and only park records are considered in detail.

Fire fighting methods and equipment, as described in the records, are reviewed. Fire management actions, history and philosophy of actions, and objectives are reviewed for the coastal prairie, and pineland fire management zones. A discussion of history and philosophy of boundary burning is presented. Number of fires and acres burned by fires that crossed the park boundary are tabulated by year.

The recorded fires are categorized as man-caused, lightning-caused, or prescribed management fires. Total acres burned by each fire type are presented by year and month of occurrence. The number of man-caused fires was found to be highly correlated with water levels at Taylor Slough Bridge and with precipitation at Royal Palm. Extreme fire years, when 20,000 to 100,000 acres may burn, follow an average interval of 6 to 8 years; moderate to severe fire years, when 10,000 to 20,000 acres may burn, occur on a 3.2 to 4.3 year interval.

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Table 1. Number of fires and acres burned by lightning fires, man-caused and prescribed fires that crossed the boundary of Everglades National Park, 1948-1979.

	LIGHTNING FIRES			MAN-CAUSED			PRESCRIBED FIRES			TOTAL FIRES			
		Acres Burned			Acres Burned			Acres Burned			Acres Burned		Total
Year	No.	Inside	Outside	No.	Inside	Outside	No.	Inside	Outside	No.	Inside	Outside	Acres
1948				1	60	1,040				1	60	1,040	1,100
1949				1	1,280	4,320				1	1,280	4,320	5,600
1950				1	1	3				1	1	3	4
1951	1	2,560	3,840	1	20	60				2	2,580	3,900	6,480
1952				3	670	1,326				3	670	1,326	1,996
1953										0			0
1954										0			0
1955				1	1,000	350				1	1,000	350	1,350
1956										0			0
1957										0			0
1958				1	250	250				1	250	250	500
1959										0			0
1960										0			0
1961										0			0
1962				4	78,077	111,408				4	78,077	111,408	189,485
1963										0			0
1964				1	3	3				1	3	3	6
1965										0			0
1966										0			0
1967										0			0
1968										0			0
1969										0			0
1970										0			0
1971										0			0
1972										0			0
1973										0			0
1974				3	64,162	26,596	1	1,264	421	4	65,426	27,017	92,443
1975				2	7,092	54,114	1	28	19	3	7,120	54,133	61,253
1976										0			0
1977										0			0
1978										0			0
1979										0			0
Totals	1	2,560	3,840	19	152,615	199,470	2	1,292	440	22	156,467	203,750	360,217

Table 2. Number of fires and acres burned by lightning fires, prescribed fires, man-caused, and all fires by year within Everglades National Park, 1948-1979. Includes portions of boundary fires that burned within the park (Table 1).

	LIGHTNING FIRES		MAN-CAUSED		PRESCRIBED FIRES		TOTAL FIRES	
Year	No.	Acres	No.	Acres	No.	Acres	No.	Acres
1948	0	0	7	176	0	0	7	176
1949	1	1	15	7,652	0	0	16	7,652
1950	0	0	14	33,520	0	0	14	33,520
1951	9	43,155	7	785	0	0	16	43,840
1952	4	3,023	13	2,845	0	0	17	5,868
1953	1	110	7	8,971	0	0	8	9,081
1954	3	3,247	3	10	0	0	6	3,257
1955	2	127	9	3,604	0	0	11	3,731
1956	7	2,201	11	1,556	0	0	18	3,757
1957	7	1,132	4	20,082	0	0	11	21,214
1958	3	305	3	750	1	1,500	7	2,555
1959	4	480	13	836	2	1,950	19	3,266
1960	5	75	6	182	3	2,395	14	2,652
1961	3	54	10	1,861	0	0	13	1,915
1962	2	33	15	78,257	1	28	18	78,318
1963	7	1,236	12	1,367	2	1,530	21	4,133
1964	1	4	7	745	0	0	8	749
1965	2	1,289	1	1	0	0	3	1,290
1966	2	15	2	2,846	1	2,250	5	5,111
1967	2	9	5	4	3	1,564	10	1,577
1968	5	434	6	432	4	130	15	996
1969	0	0	2	1,415	7	3,155	9	4,570
1970	1	30	3	2,702	2	39	6	2,771
1971	1	300	15	2,164	19	11,361	35	13,825
1972	29	1,261	7	16,104	26	3,718	62	21,083
1973	17	1,009	11	3,008	50	13,607	78	16,624
1974	12	8,412	15	67,515	35	14,749	62	90,676
1975	27	9,724	12	7,698	36	11,497	75	28,919
1976	5	92	2	13,485	19	6,961	26	20,538
1977	6	373	4	9	9	6,078	19	6,460
1978	9	926	2	121	7	1,680	18	2,727
1979	13	2,236	3	19	19	5,975	35	8,230
Totals	190	81,293	246	280,622	246	89,167	682	451,082
% of Total	28	18	36	62	36	20		

Table 3. Number of fires and acres burned by lightning fires, man-caused fires, and all fires by year outside Everglades National Park but within the Everglades Fire Protection Zone, 1948-1979. Includes portions of boundary fires that burned outside the park (Table 1).

	LIGHTNING FIRES		MAN-CAUSED		PRESCRIBED FIRES		TOTAL FIRES	
Year	No.	Acres	No.	Acres	No.	Acres	No.	Acres
1948	0	0	6	1,780			6	1,780
1949	0	0	18	13,341			18	13,341
1950	0	0	10	87,796			10	87,796
1951	4	11,529	11	2,372			15	13,901
1952	1	35	6	1,422			7	1,457
1953	0	0	5	2,690			5	2,690
1954	0	0	6	2,340			6	2,340
1955	1	1	16	8,660			17	8,661
1956	0	0	16	3,631			16	3,631
1957	1	200	4	18			5	218
1958	0	0	2	325			2	325
1959	2	124	2	5			4	129
1960	0	0	6	9			6	9
1961	0	0	18	3,506			18	3,506
1962	2	57	24	113,823			24	113,880
1963	1	5	10	6,483			11	6,488
1964	0	0	4	918			4	918
1965	0	0	8	2,132			8	2,132
1966	0	0	1	700			1	700
1967	0	0	5	137			5	137
1968	1	356	8	466			9	822
1969	0	0	3	188			3	188
1970	0	0	4	829			4	829
1971	1	9	13	81,588			14	81,797
1972	2	103	10	6,883			12	6,986
1973	1	4	12	42,018			13	42,022
1974	0	0	4	29,043	1	421	5	29,464
1975	0	0	2	54,114	1	19	3	54,133
1976	0	0	0	0	0	0	0	0
1977	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	0	0
1979	0	0	0	0	0	0	0	0
Totals	17	12,423	234	467,217	2	440	251	480,080

Table 4. Number of lightning fires and acres burned by month in Everglades National Park for period of record 1948-1979.

	Lightning Fires				
Month	Number	% by Month	Acres Burned by Month	% Burned by Month	Average Size
January	0	0	0	0	0
February	0	0	0	0	0
March	1	0.5	2	0	2
April	1	0.5	620	0.8	620
May	21	11.1	2,887	3.6	137
June	56	29.5	62,941	77.2	1171
July	38	20.0	3,354	4.2	88
August	50	26.3	10,046	12.5	201
September	12	6.3	699	0.9	58
October	8	4.2	539	0.7	67
November	2	1.1	201	0.2	101
December	1	0.5	4	0	4
Totals	190	100	81,293	100.1	430

Table 5. Categories of man-caused fires.

MAN-CAUSED FIRES

Year	Smoking	Camper	Fisherman-Hunter	Farming	Debris Burn	Incendiary	Other	Total
1948	0	1	1	1	0	4	0	7
1949	4	1	0	2	2	6	0	15
Total	4	2	1	3	2	10	0	22
1950	4	5	1	2	0	2	0	14
1951	5	0	1	0	1	0	0	7
1952	7	3	2	1	0	0	0	13
1953	1	1	0	1	0	4	0	7
1954	0	2	0	0	0	0	1	3
5-year Total (%)	17(39)	11(25)	4(9)	4(9)	1(2)	6(14)	1(2)	44
1955	2	2	0	0	0	4	1	9
1956	1	0	0	5	1	0	4	11
1957	2	0	0	0	0	1	1	4
1958	0	1	0	0	0	2	0	3
1959	3	0	1	1	0	6	2	13
5-year Total (%)	8(20	3(8)	1(3)	6(15)	1(3)	13(33)	8(20)	40
1960	2	1	0	0	0	20	1	6
1961	3	0	0	1	0	6	0	10
1962	3	0	0	2	1	6	3	15
1963	1	3	0	0	0	7	1	12
1964	2	0	0	1	1	3	0	7
5-year Total (%)	11(22)	4(8)	0(0)	4(8)	2(5)	24(60)	5(13)	50
1965	0	0	0	0	0	1	0	1
1966	2	0	0	0	0	0	0	2
1967	3	0	1	0	0	1	0	5
1968	3	0	0	0	1	2	0	6
1969	0	0	0	0	0	2	0	2
5-year Total (%)	8(50)	0(0)	1(6)	0(0)	1(6)	6(38)	0(0)	16
1970	0	0	0	1	0	2	0	3
1971	0	0	0	0	0	12	3	15
1972	0	0	0	0	0	7	0	7
1973	0	0	0	0	1	10	0	11
1974	0	1	1	1	0	8	4	15
5-year Total (%)	0(0)	1(2)	1(2)	2(4)	1(2)	39(77)	7(14)	51
1975	0	1	0	0	0	3	8	12
1976	0	0	0	0	1	0	1	2
1977	1	0	0	0	0	2	1	4
1978	0	0	0	0	0	1	1	2
1979	0	1	0	0	0	1	1	3
5-year Total (%)	1(4)	2(9)	0(0)	0(0)	1(4)	7(30)	12(52)	23
Totals and (%)	49(20)	23(9)	8(3)	19(8)	9(4)	105(43)	33(13)	246

Table 6. Number of man-caused fires and acres burned by month in Everglades National Park for period of record 1948-1979.

Month	Number	% by Month	Acres Burned by Month	% Burned by Month	Average Size
January	25	10.2	22,187	7.9	887
February	27	11.0	21,446	7.6	794
March	46	18.7	21,644	7.7	471
April	52	21.1	74,987	26.7	1442
May	37	15.0	128,998	46.0	3846
June	7	2.8	293	0.1	42
July	1	0.4	1	0	1
August	2	0.8	995	0.4	498
September	4	1.6	58	0	15
October	4	1.6	531	0.2	133
November	18	7.3	5,173	1.8	287
December	23	9.3	4,309	1.5	187
Totals	246	99.8	280,622	99.9	1141

Table 7. Number of acres burned by month where muck or hammock soil fires were recorded (at times both kinds of fires occurred on the same fire) in Everglades National Park and in the Everglades Protection Zone outside the park, 1948-1979.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Muck Fires-Acres Burned													
Total													
(inside)	3,895	2,288	13,643	59,947	147,949	35,954	0	0	0	0	6	155	263,837
(outside)	0	0	40,842	6,650	1,733	3,187	0	0	0	0	0	0	52,409
Lightning-caused													
(inside)	0	0	0	0	0	35,954	0	0	0	0	0	0	35,954
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0
Man-caused													
(inside)	0	575	13,477	59,147	135,944	0	0	0	0	0	6	0	208,149
(outside)	0	0	40,842	6,650	1,733	0	0	0	0	0	0	0	49,225
Prescribed													
(inside)	3,895	1,713	166	800	0	0	0	0	0	0	0	155	2,834
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hammock Fires-Acres Burned													
Total													
(inside)	6,134	17,940	31,179	64,384	152,487	40,680	0	105	0	492	1,253	2,344	316,998
(outside)	3,671	125	48,982	9,858	43,869	3,187	0	0	0	0	2,568	1,102	113,362
Lightning-caused													
(inside)	0	0	0	0	125	38,400	0	105	0	492	0	0	39,122
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0
Man-caused													
(inside)	0	15,260	15,423	62,084	130,755	2,040	0	0	0	0	0	1,410	226,972
(outside)	3,671	125	48,982	9,858	43,869	3,187	0	0	0	0	2,568	1,102	113,362
Prescribed													
(inside)	6,134	2,680	15,756	2,300	7	240	0	0	0	0	1,253	934	29,304
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 8. Number of fires by month where muck or hammock soil fires were recorded (sometimes both kinds of fires occurred on the same fire) in Everglades National Park and in the Everglades Protection Zone 1948-1979.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Muck Fires -Number													
Total													
(inside)	1	3	2	5	4	2	0	0	0	0	1	1	19
(outside)	0	0	5	3	4	1	0	0	0	0	0	0	13
Lightning-caused													
(inside)	0	0	0	0	0	2	0	0	0	0	0	0	2
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0
Man-caused													
(inside)	0	1	1	4	4	0	0	0	0	0	1	0	11
(outside)	0	0	5	3	4	1	0	0	0	0	0	0	13
Prescribed													
(inside)	1	2	1	1	0	0	0	0	0	0	0	1	6
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0
Hammock Fires-Number													
Total													
(inside)	4	6	7	8	11	5	0	1	0	1	3	4	50
(outside)	3	1	8	10	10	1	0	0	0	0	1	2	36
Lightning-caused													
(inside)	0	0	0	0	1	3	0	1	0	0	0	0	5
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0
Man-caused													
(inside)	0	1	4	6	9	1	0	0	0	0	0	2	23
(outside)	3	1	8	10	10	1	0	0	0	0	1	2	36
Prescribed													
(inside)	4	5	3	2	1	1	0	0	0	1	3	2	22
(outside)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 9. Number of prescribed management fires and acres burned by month in Everglades National Park 1948-1979.

	Prescribed Management Fires				
Month	Number	% by Month	Acres Burned by Month	% Burned by Month	Average Size
January	35	14.2	18,188	20.4	520
February	33	13.4	9,567	10.7	290
March	26	10.6	20,705	23.2	796
April	23	9.3	5,771	6.5	251
May	9	3.7	649	0.7	72
June	3	1.2	272	0.3	91
July	6	2.4	1,225	1.4	204
August	3	1.2	401	0.5	134
September	9	3.7	1,635	1.8	182
October	27	11.0	5,634	6.3	209
November	38	15.4	10,838	12.2	285
December	34	13.8	14,282	16.0	420
Totals	246	99.9	89,158	100	362

Table 10. Relationship between water levels/precipitation and the number of fires/acres burned in Everglades National Park.

	Number of Fires			Number of Acres Burned		
	Slope	y - Intercept	Correlation Coefficient	Slope	y - Intercept	Correlation Coefficient
Total Fires January-December						
1. January-December Precipitation	-.285	38.4	-.187	-357.9	33781.7	-.229
Total Fires June-May						
1. June-May Precipitation	-.335	40.8	-.203	-882.2	64545.5	-.499
2. June-May Water Levels	-.037	25.7	-.034	-27154.6	81526.4	-.561
Man-Caused Fires - May						
1. May Precipitation	-.104	1.8	-.312	-766.5	8181.4	-.252
2. April and May Precipitation	-.093	2.0	-.296	-811.2	10613.4	-.255
Man-Caused Fires January-May						
1. Water Levels January-May	-3.44	9.97	-.699	-13085.0	28429.6	-.434
2. Precipitation January-May	-.238	8.69	-.414			
Man-Caused Fires January-December						
1. Precipitation January-May	-.376	12.77	-.534	-719.2	19241.4	-.248
2. Water Level January-December	-5.4	20.4	-.606	-12502.2	41372.1	-.298
3. Precipitation January-December	-.152	16.1	-.458	-279.2	24852.5	-.204
4. Visitation January-December	-.000003	10.0	-.273	-.001	10403.7	-.034
Man-Caused Fires June-May						
1. Water Level June-May	-7.29	24.7	-.760	-22621.2	65441.3	-.511
2. Precipitation June-May	-.217	19.8	-.618	-684.7	47209.9	-.447
3. Water Levels January-May	-4.44	13.4	-.716	-13025.7	29036.0	-.454

Period of Record: Water levels (ft mean sea level/month) at Taylor Slough Bridge, 1961 to Present
Precipitation (inches/month) at Royal Palm, 1948 to Present
Fires for Everglades National Park, 1948 to Present

Table 11. The number of man-caused fires from fire records and the predicted number of man-caused fires from water levels at the Taylor Slough Bridge, well S-196, and Royal Palm precipitation (Based on June-May hydrologic year).

Year	Number of fires Recorded	Predicted Number of Fires		
		Royal Palm Precipitation	Taylor Slough Bridge	Well S-196
1979	3			2.8
1978	2	6.2	3.6	1.6
1977	4	6.7	5.3	3.4
1976	3	7.4	9.8	10.7
1975	15	8.6	12.1	10.5
1974	12	8.3	11.2	9.8
1973	12	8.7	6.9	6.8
1972	11	8.8	8.9	10.7
1971	12	12.2	12.7	13.7
1970	1	3.0	1	3.7
1969	1	2.7	0	2.8
1968	7	2.8	8.5	9.1
1967	4	5.8	4.3	5.4
1966	3	7.0	9.1	9.0
1965	4	7.6	7.4	5.8
1964	6	7.4	5.5	5.6
1963	13	8.1	8.3	6.8
1962	16	12.8	12.5	10.8
1961	5	5.2	End	(0)
1960	7	3.7		(0)
1959	13	5.5		0.4
1958	4	7.7		(0)
1957	6	7.0		11.2
1956	9	10.8		7.0
1955	9	9.7		1.4
1954	3	4.5		(0)
1953	9	9.1		3.1
1952	11	10.5		8.6

Table 11 (cont)

Year	Number of fires Recorded	Predicted Number of Fires: Royal Palm Precipitation	Taylor Slough Bridge	Well S-196
1951	6	End		3.8
1950	14			2.3
1949	14			2.0
1948	(Incomplete)			(0)
1947	End			3.3
1946				7.1
1945				9.3
1944				3.8
1943				3.0
1942				(0)
1941				(0)
1940				3
1939				8.9
1938				3.3
1937				(0)
1936				(0)
1935				2.3
1934				(0)

Model for: Royal Palm precipitation: $Y = 19.8-.217$ (precipitation)
Taylor Slough Bridge water level: $Y = 24.7-7.29$ (water level)
S-196: $Y - 25.26-6.98$ (water level)

where $Y = a - bx$; Y = number of fires, a = Y intercept, b = slope of line, and x = precipitation (inches) or water level. (feet mean sea level).

A Chi-square test for differences between observed number of fires and calculated number of fires resulted in the following:

Royal Palm precipitation: $X^2 = 11.4$; $X^2_{.05,26df} = 38.9$ not significant

Taylor Slough Bridge: $X^2 = 11.6$; $X^2_{.05,\ 16\ df} = 26.3$ not significant

Well S-196
1970 to 1979 $X^2 = 13.6$; $X^2_{.05,\ 9\ df} = 16.9$ ns
1960 to 1979 $X^2 = 17.3$; $X^2_{.05,\ 18\ df} = 28.9$, not significant
1948 to 1979 $X^2 = 31.4$; $X^2_{.05,\ 29\ df} = 42.6$, not significant

Table 12. Chronological list of years when extreme fire activity occurred in South Florida.

1909 Robertson (1953) quotes Small's observations of fires in hammocks.

1916-1917 Robertson (1953) quotes Small's observation near Madeira Bay and Cape Sable, 1916, and Royal Palm Hammock and Long Pine Key, 1917. A historic freeze occurred in February 1917.

1921 Robertson (1953) states William McKinley Osceola, Seminole patriarch, observed the first big over-all fires in the lower glades occurred in 1921, which was a dry year with the effects of glade drainage just beginning to be felt. Many of the garden hammocks of the Seminoles were destroyed. Small (1923) recorded a protracted drought.

1926 Robertson (1953) quotes Dovell (1942) as stating, "dry weather through winter witnessed an unprecedented series of grass and muck fires."

1931-1932 Robertson (1953) quotes Dovell (1942) "Unusually low water levels in Lake Okeechobee and the Everglades in 1931 and 1932 found many grass and muck fires throughout the glades."

1938-1939 (Robertson (1953) quotes Beard (1938) as stating the Everglades area was badly burned during the winter of 1937-38. About one-half of the piney woods in the park area were burned, about 80% of the Everglades prairie, approximately 30% of the coastal prairie, probably 5% or less of the Ten Thousand Island coast, and about the same amount of cypress."

1945 Robertson (1953) quotes Winte as stating "there was no water to be found anywhere in the glades, Taylor Slough and the canals around Paradise Key. The Tamiami Canal was almost dry." Fires burned until at least June 21.

1950 - 33,520 acres burned (Table 2)

1951 - 43,840 acres burned (Table 2)

1962 - 78,318 acres burned (Table 2)

1971 - Hydrologic records indicate extreme year.

1974 - 90,676 acres burned (Table 2).

APPENDIX I

Chronological Listing of Individual Fire Reports

1948 - 1979

1948

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	4801	Flamingo #1	61S-34E-5	1	2/8	6	I
	4802	Lostman's River	56S-32E-26	2	3/1	25	I
	4803	Broad Creek Headwaters	(not available)	3	3/12	5	I
*	4804	County #1	58S-38E-5	5	3/19	9.5	I
*	4805	County #2	58S-38E-4	6	3/20	133	I
	4806	Cement Bridge	59S-35E-14	4	3/23	.25	I
	4807	Flamingo #2	61S-34E-7	7	4/1	4	I
	4808	Little Fox Lake	60S-33E-20	8	4/7	75	I
B	4809	East Boundary	58S-37E-12	9	4/28	1100	I
*	4810	Osteen	58S-37E-5	10	11/22	247	I
*	4811	Plummer Dump	56/58-?-28	11	12/21	350	I

* Designates a fire outside the 1979 park boundary in the Everglades Fire Protection Zone.
B Designates a fire that crossed the park boundary.
NA or not available

Cause: I - Designates all man-caused fires.
P - Prescribed
L - Lightning

1949

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	4901	Musselwhite	58S-37E-12	1	1/5	7	I
	4902	Brendenberg	58S-37E-13	2	1/14	4.2	I
	4903	Frederico	58S-37E-16	3	1/20	32.8	I
	4904	Middle Cape	60S-32E-31	7	1/23	450	I
*	4905	No Name	58S-37E-12	4	2/3	.04	I
*	4906	Krome Ave & Tamiami Trail	55S-38E-1	5	2/5	18.9	I
*	4907	Karrup	56S-38E-2	6	2/5	155.2	I
*	4908	Loveland #1	57S-38E-29	8	2/11	134.4	I
B	4909	MacDonell	55S-37E-3	9	2/12	5600	I
	4910	Rodgers River	56S-33E-32	10	2/14	110	I
	4911	Harney River	58S-33E-17	11	2/17	800	I
	4912	Rodgers Bay	56S-33E-32	12	3/1	100	I
	4913	Broad Creek Headwaters	57S-33E-32	13	3/1	75	I
	4914	Seven Palm Lake	60S-36E-18	14	3/1	5	I
*	4915	Loveland #2	57S-38E-17	15	3/6	1	I
*	4916	Grossman Dr.	55S-38E-1	16	3/9	1500	I
*	4917	Lucille Dr.	57S-38E-4	(none)	3/11	2560	I
*	4918	Loveland #3	58S-38E-8	17	3/15	425	I
	4919	Cement Bridge	59S-35E-14	18	3/15	1.5	I
	4920	Frederico #2	58S-37E-21	19	3/17	4.5	I
*	4921	Krome #2	54S-38E-24	20	3/17	95	I
*	4922	Krome #3	54S-38E-13	21	3/19	1500	I

1949 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	4923	Tamiami Tr. #1	54S-38E-2	22	3/22	96	I
*	4924	Loveland #4	57S-38E-31	23	3/27	2500	I
	4925	Concrete Bridge #2	59S-35E-14	24	3/28	.25	I
*	4926	Hainlin Mill #1	56S-38E-14	25	4/3	1.7	I
	4927	Alligator Bay	55S-32E-8	27	4/22	4480	I
	4928	Glades View	58S-37E-14	28	7/8	1	L
	4929	Jenning's Estate #1	59S-36E-16	29	11/1	16.8	I
*	4930	Loveland #5	57S-38E-32	31	11/12	.54	I
*	4931	Eichenberg	57S-38E-20	30	11/28	6.4	I
*	4932	Stepladder #1	58S-38E-7	32	12/11	18.45	I
	4933	Lostman Bay	56S-32E-12	26	4/22	290	I

1950

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5001	USDA	61S-34E-8	1	1/30	3	I
*	5002	Grossman's #1	55S-38E-33	2	2/19	45.9	I
	5003	Krome #1	54S-36E-25	3	2/22	330.05	I
*	5004	Grossman #2	56S-38E-3	4	2/25	26.6	I
	5005	Long Pine Key #1	58S-37E-hiatus	5	3/6	100.25	I
	5006	Tamiami #1	54S-36E-22	6	3/10	72	I
	5007	No Name	61S-32/33E-?	7	3/15	3	I
B	5008	Tamiami #2	54S-35E-24	8	4/10	4	I
*	5009	Krome #2	54S-38E-34	10	4/22	800	I
	5010	Long Pine Key #2	58S-36E-25	11	4/24	256	I
	5011	Long Pine Key #3	58S-36E-23	12	4/25	480	I
*	5012	Tamiami Trail #3	54S-38E-?	13	5/6	24000	I
	5013	Long Pine Key #4	58S-35E-2	14	5/8	32240	I
	5014	East Cape Canal	61S-32E-11	17	5/9	.01	I
*	5015	Mowry	57S-38E-17	15	5/10	2560	I
*	5016	Bamboo Hammock	55S-38E-1	20	5/11	310	I
	5017	Loop Road #2	54S-35E-21	18	5/13	1	I
	5018	East Cape Canal #2	61S-32E-11	19	5/15	.01	I
*	5019	Loop Road	54S-33E-19	16	5/20	60000	I
	5020	Andrews	61S-34E-5	21	11/28	4	I
*	5021	West Boundary #1	54S-35E-31	22	12/15	not given	I
*	5022	Lucille Drive	57S-38E-31	23	12/18	50	I
	5023	Flamingo Flats	61S-34E-5	9	4/12	.5	I

1951

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5101	Roberts	61S-34E-7	1	2/27	9.5	I
*	5102	Loveland #1	58S-38E-5	2	3/16	.23	I
	5103	Tamiami Trail #1	54S-35E-35	3	3/17	2.25	I
*	5104	Highway #27 #1	58S-38E-5	4	3/18	25	I
	5105	Flamingo #1	61S-33E-9	5	3/22	26	I
*	5106	Loveland Rd. #2	57S-38E-29	6	3/25	80	I
	5107	Tamiami Trail #2	54S-36E-21	7	4/26	2	I
B	5108	Route #27 #2	58S-38E-18	8	5/2	80	I
*	5109	Krome Avenue #1	54S-38E-25	9	5/3	1040	I
*	5110	Route #27 #3	58S-38E-12	10	5/4	1	I
*	5111	Rock Pit #1	58S-38E-12	11	5/26	.25	I
B	5112	Pine Key #1	58S-36E-22	12	6/7	6400	L
	5113	Avocado Creek	58S-34E-19	13	6/7	700	L
*	5114	Tamiami Trail #3	54S-37E-9	14A	6/12	7680	L
*	5115	Highway #27 #4	58 1/2S-36E-20	14B	6/14	1	L
	5116	Rt. #27 #5	58S-37E-23	15	6/16	.25	L
	5117	Pot Hammock	55S-35E-11	16	6/22	30720	L
	5118	Rock Reef	57S-35E-34	17	6/24	6400	L
	5119	Shark Valley	57S-38E-20	18	6/24	2040	I
*	5120	Tamiami #5	55S-37E-5	NS2	8/5	8	L
	5121	Long Pine Key #2	58S-37E-19	19	8/10	240	L

1951 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5122	Taylor Slough #2	58S-37E-3	20	8/10	220	L
	5123	Avocado Creek	58S-34E-16	21	8/30	275	L
*	5124	Grossman #1	55S-37E-25	22	11/25	35	I
*	5125	Loveland #3	58S-38E-5	23	12/3	40	I
*	5126	Plummer Dr.	58S-38E-27	24	12/6	1040	I
	5127	Barnes Farm	58S-37E-16	25	12/14	310	I
	5128	Chaney's Camp	58S-37E-7	26	12/29	315	I
*	5129	Tamiami Trail #6	55S-38E-7	27	12/29	90	I

1952

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
B	5201	Boundary Line	55S-34E-2	1	1/3	700	I
	5202	Trail Roadside #1	54S-36½E-	2	1/24	1	I
	5203	Cloninger Farm	58S-37E-17	3	2/28	1080	I
	5204	Tamiami Trial #2	54S-36E-24	4	4/7	.25	I
B	5205	Lucille Drive	57S-38E-31	6	4/9	1066	I
	5206	Tamiami Trail #1	54S-36E-24	7	4/10	160	I
	5207	Tarpon Creek	60S-34E-17	8	4/16	.1	I
*	5208	Grossman	55S-37E-25	9	4/20	40	I
	5209	Canal	59S-35E-34	10	5/6	.1	I
	5210	Middle Glade Lightning	57S-36E-22	11	6/11	2250	L
	5211	Tamiami Trail #4	54S-36E-24	12	6/19	3	I
	5212	Camp Lonesome	57S-33E-23	13	6/19	620	L
*	5213	Taylor Slough	58S-38E-10	14	6/22	35	L
	5214	Rocky Creek	56S-33E-19	15	6/22	150	L
*	5215	Lucille #2	57S-37E-25	16	9/8	50	I
	5216	Long Pine Key #1	58S-36E-35	17	11/23	860	I
B	5217	Ten Mile Corner	56S-34E-2	18	11/29	230	I
*	5218	Green Fuel	57S-38E-36	19	12/7	6	I
	5219	Two Spot	58S-36E-35	20	12/11	.3	I
	5220	Buggy	58S-37E-19	21	12/27	72	I
	5221	Rowdy Bend	60S-34E-26	5	4/8	.5	I

1953

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	5301	Four Crew	58S-38E-19	1	1/17	1080	I
*	5302	Tower Road	57S-38E-33	2	1/25	1300	I
*	5303	Plummer Drive Dump	56S-38E-28	3	3/21	2	I
	5304	Picnic Area	58S-37E-15	4	3/30	.01	I
*	5305	Coconut Palm	56S-38E-21	5	4/4	1	I
*	5306	Bauer-Epmore	56S-38E-29	6	4/11	307	I
	5307	Broad River	57S-33E-16	7	4/30	50	I
	5308	Wood River	57S-33E-27	8	5/1	300	I
	5309	Two Eye Bay	56S-32E-5	9	5/3	5760	I
	5310	Lewis	59S-35E-2	10	5/14	2704	I
	5311	Johnston	57S-33E-32	11	6/21	110	L
	5312	Carpenter Farm1	57S-37E-31	12	11/4	154	I
	5313	Lower Arsnicker Key	(not available)	13	12/29	1.6	I

1954

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5401	Jenning's Estate	59S-36E-14	1	4/3	620	L
	5402	Jimmie's Hammock	56S-31E-28	2	4/10	1	I
*	5403	Dike	55S-38E-21	3	4/15	780	I
*	5404	Lost Smoke	57S-37E-14	4	5/3	5	I
*	5405	Mother's Day	56S-37E-33	5	5/9	161	I
*	5406	Try Again	56S-37E-25	6	5/11	1377	I
	5407	Big Rain	58S-35E-14	7	5/22	125	L
	5408	Double Lightning	58S-36E-10	8	6/11	2502	L
*	5409	No Name	57S-38E-5	NS-1	12/2	3750 sq. ft.	Unknown
*	5410	N-S	55S-38E-27	NS-2	12/8	16	I
	5411	No name	60S-38E-17	NS-3	12/11	1	I
	5412	No name	55S-32E-19	NS-4	12/29	8.5	I

1955

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	5501	Long Finger Fire	57S-37E-13	1	1/16	150	I
*	5502	Cowboy's Fire	57S-38E-32	NS-2	1/21	.5	I
	5503	Glades Buggy	59S-36E-13	2	1/23	1870	I
*	5504	Panama Pump	57S-38E-8	3	1/31	.2	I
*	5505	Hot Pants	57S-37E-1	4	2/1	2604.8	I
	5506	Real Estate	59S-36E-16	5	2/10	460	I
*	5507	Muddy Acres	55S-38E-22	6	2/20	192	I
*	5508	Tomato Patch	57S-38E-30	7	2/24	25	I
*	5509	Three Report	55S-37E-25	NS-4	3/5	1	I
*	5510	Little Mystery	57S-37E-25	8	3/10	4	I
*	5511	Devenport	57S-38E-21	9	3/20	2386	I
	5512	Boy Scout	58S-37E-6	10	3/26	220	I
	5513	Near Bridge	54S-36E-21	11	4/4	1	I
	5514	Road Shoulder	54S-36E-22	12	4/4	1	I
*	5515	Camp Crackup	55S-34E-28	NS-5	4/17	75	I
	5516	Cane Patch	58S-34E-20	NS-6	4/24	.1	I
B	5517	Buggy Exhaust	55S-35E-5	13	4/24	1350	I
*	5518	Road Jump	54S-34E-16	14	4/27	760	I
	5519	Rock Reef	58S-36E-16	15	5/6	1.5	L
	5520	Night Glow	56S-34E-13	16	5/6	125	L
*	5521	Flapper	55S-38E-15	17	5/23	5	I

1955 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5522	Roger's Creek	56S-33E-34	NS-7	6/5	.1	I
	5523	Indian Camp Creek	56S-33E-35	18	6/5	50	I
*	5524	Cooperstown	54S-38E-8	19	6/8	2	I
*	5525	Wet Strike	55S-34E-2	NS-8	6/22	.5	L
*	5526	Grossman Drive	55S-38E-33	20	12/13	1925	I
*	5527	Sullivan	55S-38E-26	21	12/26	177.6	I

1956

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	5601	West Wind	56S-38E-27	1	1/10	380	I
*	5602	Navy Pumping Sta.	57S-38E-27	NS-1	1/10	428	I
	5603	Hayes Field	58S-37E-19	2	1/15	.73	I
	5604	Pops Points	58S-38E-7	3	1/17	.05	I
*	5605	Porter	55S-38E-34	4	1/27	2.5	I
	5606	Davis	58S-37E-18	5	2/4	16	I
*	5607	Dr. Tiger Hammock	55S-34E-4	6	2/19	132	I
*	5608	Bucknall	56S-38E-17	7	2/21	538	I
*	5609	Half Dollar	56S-38E-2	NS-2	about 3/1	.01	I
	5610	Neely	58S-37E-19	NS-3	3/9	n/a	I
	5611	Tamiami Trail	54S-36E-24	8	3/25	1360	I
	5612	Flamingo	60S-34E-33	9	3/27	.25	I
*	5613	One Jump	55S-38E-23	10	4/8	50	I
	5614	Pulpcutter	58S-36E-25	11	4/17	3.33	I
	5615	Jeep Exhaust	54S-36E-19	12	4/23	132	I
*	5616	Sunday Driver	54S-38E-10	13	5/13	135	I
*	5617	Monroe Co. Line	54S-34E-24	14	5/13	32	I
*	5618	Wishart	57S-37E-14	15	5/24	870	I
*	5619	Interior	554S-37E-20	16	5/24	.03	I
	5620	Iori Root Burn	58S-36E-25	17	6/1	9	I
*	5621	Grossman Hammock	55S-37E-25	18	6/9	200	I

1956 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5622	Airplane	56S-35E-12	19	6/15	2.4	I
	5623	Shark-Broad	57S-34E-31	NS-5	6/20	35	L
	5624	Little Lightning	57S-36E-13	NS-6	6/26	2.5	L
	5625	Seven Palms Lake	60S-36E-15	NS-7	6/27	150	L
	5626	End-O-Season	56S-35E-1	20	6/29	8	L
	5627	Airplane Crash	56S-37E-10	NS-8	7/16	1	I
	5628	Bise	57S-37E-22	21	8/26	1600	L
	5629	Lucille Drive	57S-37E-26	22	8/28	25	L
	5630	Two Trip	58S-36E-10	23	8/29	380	L
	5631	Iori Fertilizer Sack	58S-37E-25	24	10/22	31	I
*	5632	Palm Drive	57S-38E-29	25	12/15	860	I
*	5633	Lost Boys	56S-37E-4	NS-10	12/26	.5	I
*	5634	Walk-in	55S-37E-23	26	12/26	3	I

1957

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	5701	Mills (Block A)	58S-36E-1	1	1/16	18870	I
*	5702	Radio Tower	55S-38E-34	NS-1	1/28	1.6	I
*	5703	Photographer's	57S-38E-5	2	2/16	1.4	I
	5704	Park Corner	54S-36E-24	3	2/17	512	I
*	5705	Rain Shower	57S-38E-31	4	3/5	2	I
	5706	Three Strike	55S-35E-35	NS-2	3/15	1.5	L
*	5707	Wysong	57S-38E-31	5	5/8	12	I
	5708	Shark Valley	57S-35E-21	NS-3	6/14	30	L
*	5709	Night Call	57S-38E-6	6	7/7	200	L
	5710	Otter Creek	58S-34E-5	NS-4	8/3	600	L
	5711	Adside	58S-37E-18	7	8/10	75	L
	5712	Block I	58S-37E-7	8	8/11	695	I
	5713	Lone Snag	59S-36E-22	NS-5	8/12	175	L
	5714	Nine Mile Bend	59½S-36E-S. hiatus	NS-6	8/20	200	L
	5715	Five Strike	57S-33E-25	NS-7	9/25	50	L
	5716	First Day	58S-36½E-hiatus	9	11/10	5	I

1958

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
B	5801	Myrtle Ridge	58S-33E-17	NS-1	4/16	500	I
	5802	Block B	58S-36E-12	no #	4/21	1500	P
	5803	Onion Key Bay	56S-32E-9	NS-2	5/8	200	I
	5804	Block C	58S-36E-10	NS-3	6/20	75	L
	5805	Squawk Creek	58S-33E-25	NS-4	8/6	30	L
	5806	N.W. Cape	60S-31E-2	NS-5	8/27	300	I
	5807	Second Bay	56S-31E-24	NS-6	10/8	200	L
*	5808	Hamilton Lake	55S-32E-27	NS-7	10/18	75	I

1959

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	5901	Richmond & Richard	55S-38E-24	1	1/8	1	I
	5902	Block E	58S-37E-1	No #	1/18	1150	P
	5903	Tom's Creek	56S-32E-32	NS-1	4/3	5	I
	5904	Jump Fire (Blks G & F)	58S-37E-6	No #	4/8	800	P
	5905	Roadside Table	54S-36E-20	2	4/14	.02	I
	5906	Windy	54S-35E-22	3	4/14	.04	I
*	5907	Late Date	57S-37E-36	4	4/15	3.5	I
	5908	Wood Key Cove	56S-31E-22	NS-3	4/19	3	I
	5909	Flare Fire	54S-35E-23	5	4/21	.02	I
	5910	Cabbage Bay	56S-32E-1	NS-4	4/23	295	I
	5911	Dust Devil	58S-36E-29	6	4/27	.1	I
	5912	Indian Fire	54S-36E-21	7	5/3	.24	I
	5913	Alligator Bay	55S-32E-17	NS-5	5/4	190	I
	5914	Hot Fire	54S-36E-23	8	5/5	.24	I
	5915	Chevelier Bay	54S-31E-25	NS-6	5/9	290	I
	5916	Chatham Headwaters	54S-31E-34	NS-7	5/28	20	I
	5917	Otter Creek	57S-34E-33	NS-8	6/29	320	L
	5918	Willy-Willy	56S-33E-19	NS-9	7/3	105	L
*	5919	Moyer's Cabin Fire	54S-34E-28	NS-10	7/3	69	L
*	5920	South Pine Crest	54S-34E-29	NS-11	7/8	55	L
	5921	Green Flare	58S-33E-4	NS-12	9/12	30	I
	5922	Fox Lake	60S-33E-20	NS-13	10/2	5	L
	5923	Marsh Grass	56S-32E-7	NS-14	10/2	50	L

1960

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	6001	Block H	57S-37E-4	No #	2/10	850	P
	6002	James Byrnes Bus	57S-36E-9	1	2/24	1	I
	6003	Block J	58S-37E-9	No #	2/24	715	P
*	6004	Merris Truck	54S-38E-12	NS-2	3/5	1	I
*	6005	Darkies Fire	53S-36E-16	NS-1	3/5	1	I
	6006	Block I	58S-37E-8	No #	3/17	830	P
*	6007	Paper Bag Fire	57S-38E-8	NS-3	3/23	4	I
	6008	Hayes Rd.	58S-37E-17	2	3/27	175	I
	6009	Telephone Co.	54S-36E-23	3	5/14	2.30	I
	6010	Hamilton Place	57S-31E-10	NS-4	5/18	2	I
	6011	Old Pole	54S-36E-21	4	5/19	1	I
	6012	Sandy Key	62S-33E-16	NS-5	5/21	1	I
*	6013	Oceolas	54S-37E-7	5	5/22	1	I
	6014	Cross Bay	53S-30E-28	NS-6	5/24	5	L
	6015	East Cape	61S-32E-14	6	5/28	14.6	L
	6016	Middle Glade	56S-36E-19	7	6/3	2.25	L
*	6017	Sunday Picnic	54S-37E-5	8	6/12	.01	I
	6018	Broad River	57S-32E-24	NS-7	7/16	50	L
	6019	Gate Six	58S-36E-15	NS-9	8/25	2	L
*	6020	Lost Township	56S-37E-8	NS-10	12/9	.1	I

1961

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6101	Loveland & Lucille	57S-38E-29	1	2/7	1.5	I
*	6102	Loveland-Lucille #2	57S-38E-29	2	2/14	1.5	I
	6103	Madeira Corner	58S-37E-32	3	3/12	1	I
	6104	Tan Truck	58S-37E-9	NS-1	3/17	2	I
	6105	Paper Bag	58S-36E-36	4	3/22	.5	I
	6106	Halfway Creek	53S-30E-19	NS-2	4/1	75	I
*	6107	West Mowry	56S-38E-18	5	4/7	3.57	I
*	6108	Twin (Double) Set	57S-38E-7	6	4/9	200	I
*	6109	Dike Fire	55S-38E-14	7	4/11	240	I
*	6110	Range	56S-37E-12	8	4/24	300	I
	6111	Turner River Mounds	53S-29E-29	NS-4	4/26	22	I
*	6112	Tall Tower	55S-38E-31	9	4/27	80	I
*	6113	End of Lucille	57S-37E-25	NS-3	4/28	.08	I
*	6114	Dawal Ditch	58S-38E-9	10	4/30	40	I
*	6115	South Glade	58S-38E-32	11	4/30	90	I
*	6116	Mayday	57S-37E-18	12	5/1	2000	I
*	6117	Farewell	57S-37E-25	13	5/5	24	I
*	6118	Blister	55S-38E-31	14	5/16	40	I
	6119	4th of July	55S-36E-2	15	7/3	36	L
	6120	New Boots	58S-37E-25	16	8/2	3	L
	6121	New Plane	56S-36E-8	17	8/8	15	L

1961 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	6122	Dream Land	59S-36E-13	18	11/24	3	I
	6123	Cypress	59S-37E-6	19	11/24	200	I
*	6124	Airboat Trail	55S-34E-16	20	12/3	242	I
*	6125	West Lostman's Pine	54S-32E-36	22	12/3	175	I
*	6126	East Lostman's Pine	55S-33E-21	21	12/7	10	I
*	6127	North Lostman's Pine	54S-32E-25	23	12/10	55	I
*	6128	Suppertime	58S-38E-7	24	12/17	1.5	I
	6129	Lunchtime	58S-37E-11	25	12/19	.2	I
	6130	Indian Camp Creek	57S-33E-3	NS-5	12/29	150	I
	6131	Dr. Tiger Hammock	54S-34E-33	26	12/30	1408	I

1962

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6201	Ten Mile Corner	56S-35E-5	1	1/3	250	I
*	6202	Duck Camp	55S-37E-2	2	1/6	4	I
*	6203	N. Richard Rd.	55S-38E-15	3	1/6	2	I
*	6204	Lucille Glades	57S-38E-29	4	1/10	7	I
	6205	Iori Farm	58S-36E-25	5	1/17	.5	I
	6206	Brandenberg	58S-37E-17	6	1/17	2.5	I
B	6207	Boundary Survey	not available	NS-1	1/28	56	I
	6208	Taylor Slough Spot	58S-37E-11	7	2/15	1	I
*	6209	Coconut Palm	56S-38E-20	9	3/7	160	I
*	6210	Spoilbank	54S-37E-10	8	3/8	1	I
*	6211	Trail-Dike	54S-38E-10	10	3/19	500	I
*	6212	Silver Palm Glades	56S-37E-14	11	3/28	640	I
*	6213	Airboat Association	54S-37E-10	12	4/1	90	I
*	6214	Hainlin Glade	56S-38E-18	13	4/3	120	I
	6215	Picnic	58S-37E-7	14	4/8	.5	I
*	6216	Glader Park	54S-37E-12	15	4/25	2.25	I
B	6217	Pinecrest	54S-34E-21	16	4/26	1835	I
*	6218	Pine Strip	not available	NS-2	5/2	.25	I
*	6219	Trail	54S-37E-12	17	5/7	232	I
B	6220	Aerojet	58S-37E-25	18	5/9	3050	I
*	6221	Bauer Dr. Glade	not available	NS-3	5/9	2.5	I
B	6222	Shark Valley Fire	54S-32E-25	19	5/15	184544	I

1962 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	6223	Fairchild Hammock Set	58S-37E-4	20	5/21	1	I
	6224	Panther Glade Set	57S-37E-31	21	5/21	1	I
	6225	Tower Rd. Spot	54S-36E-19	22	5/29	.04	I
	6226	Overlook	58S-35E-13	23	7/2	30	L
*	6227	Valley Center	not available	NS-4	7/19	5	L
*	6228	Grossman	55S-37E-25	24	7/29	2	I
	6229	7 Mile Road	55S-36E-30	25	8/7	3	L
*	6230	Otter Creek	not available	NS-5	8/28	50	L
	6231	Blocks R & S	58S-37E-1	No #	9/10	28	P
	6232	Sam Willie Camp Fire	54S-35E-23	26	9/26	3	I
*	6233	Coconut Palm Glade	56S-38E-19	27	11/25	35	I
*	6234	Richmond Road	55S-38E-22	28	11/29	15	I
	6235	Gate 7	58S-36E-28	29	12/1	35	I
	6236	Iori Pines	58S-36E-26	30	12/9	130	I
	6237	Big Thick	59S-37E-9	31	12/15	5	I
*	6238	Missing Links	58S-38E-3	32	12/17	1	I
*	6239	Arvida	56S-38E-2	33	12/18	50	I
*	6240	Five Break Road	57S-37E-25	34	12/25	300	I

1963

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6301	Avocado Farm	57S-38E-5	1	1/6	5	I
*	6302	E. Boundary Buggy Trail	57S-37E-13	2	1/6	3	I
*	6303	Park Entrance	58S-38E-7	3	1/25	1	I
	6304	Mahogany Pinewood	58S-35E-9	4	1/28	60	I
	6305	Long Sound	60S-38E-11	NS-1	2/3	5	I
	6306	Block I	58S-37E-8	No #	2/6	830	P
	6307	Cloninger Field	58S-37E-17	5	2/11	1.1	I
	6308	Aerojet Rd.	58S-37E-31	6	3/17	1	I
	6309	Wreckage Searcher	56S-35E-18	7	3/21	1	I
	6310	Charcoal Picnic	58S-37E-7	8	3/24	1	I
*	6311	Aerojet Rd. #2	58S-38E-19	9	4/12	1.25	I
*	6312	Grossman Willow Strand	55S-37E-25	10	4/14	90	I
*	6313	Missile Range	57S-38E-32	11	4/14	58	I
*	6314	Grossman Chain	55S-37E-25	12	4/21	100	I
	6315	South Fire Break Rd.	57S-37E-35	13	4/21	800	I
*	6316	East Glade	56S-37E-13	14	4/29	6000	I
	6317	Rodger's Creek	56S-33E-21	15	5/6	300	I
	6318	Captain Tony Strand	56S-36E-3	16	5/26	190	I
*	6319	Lucky Rain Strike	57S-37E-8	NS-2	6/2	5	L
	6320	Rock Reef Strike	57S-36E-33	NS-3	6/5	5	L
	6321	Fire Gate #9	58S-36E-12	17	6/6	.25	L
	6322	Block A	58S-36E-21	NS-4	7/28	10	L

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	6323	Rock Reef Glades	57S-36E-33	18	7/28	100	L
	6324	Sawgrass Stand	55S-36E-29	NS-5	7/30	20	L
	6325	Ingraham Hwy.	59S-36E-7	19	8/22	750	L
	6326	Donut Pines	58S-36E-34	20	8/25	350	L
	6327	LPK Campsite #40	58S-37E-7	NS-6	11/29	1	I
	6328	Bick Thick #2	59S-37E-8	NS-7	12/1	.5	I
	6329	Old Farmfield	58S-36E-35	21	12/8	6	I
	6330	Block C	58S-36E-15	No #	12/16	700	P
*	6331	Batt. "B" Nike	57S-38E-31	22	12/21	205	I
*	6332	Southwest Transmitter	55S-38E-22	23	12/28	19	I

1964

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	6401	Barnes Field	58S-37E-16	1	1/10	9	I
	6402	Hiatus (or Southeast)	58S-36E-36	2	2/8	635.41	I
*	6403	Palm Dr. Glade	57S-38E-19	3	2/26	25	I
*	6404	Hainlin Dr. Sack Fire	56S-38E-10	4	3/2	340	I
*	6405	Mowry Glade (Or Grudge)	57S-38E-12	5	5/10	550	I
B	6406	Taylor Slough	57S-37E-28	6	5/21	6	I
	6407	Pineland Trail	58S-36E-12	7	9/12	1	I
	6408	Strano Field	58S-37E-18	8	11/8	90	I
	6409	Five Mile	55S-36E-12	9	12/5	4	L
	6410	Narrowhead	54S-36E-24	10	12/12	.2	I
	6411	Big Thick	59S-37E-17	11	12/26	2	I

1965

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6501	Mowry Dr.	57S-38E-18	1	1/4	90	I
*	6502	West Silver Palm	56S-37E-21	2	4/9	3	I
*	6503	Hainlin Farm	56S-38E-16	3	5/6	1600	I
*	6504	N.W. Grossman	56S-37E-23	4	5/11	1	I
*	6505	Entrance Firebreak	58S-38E-12	5	5/21	15	I
*	6506	West Bauer Bust	56S-38E-31	6	5/22	410	I
	6507	East Rodgers	57S-34E-11	7	6/24	1280	L
	6508	Evening Lightning	55S-35E-33	8	7/16	9	L
*	6509	Power Line	56S-37E-14	9	8/29	3	I
*	6510	Campbell Field	56S-38E-20	10	9/1	10	I
	6511	Dwarf Cypress	58S-36E-18	11	12/9	1	I

1966

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	6601	Block A	58S-36E-21	(None given)	1/17	2250	P
	6602	April Fool's	58S-37E-4	1	4/1	2100	I
*	6603	South Consol	56S-38E-18	2	4/22	700	I
	6604	Sisal Pond Fire	58S-35E-24	3	5/5	746	I
	6605	Fire Gate II	57S-37E-30	4	5/16	6	L
	6606	6 Mile Lightning Strike	56S-36E-?	5	5/21	9	L

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6701	Bee Hive	58S-38E-7	1	3/21	8	I
*	6702	Suburban Acres	55S-38E-16	2	3/25	28	I
*	6703	Coopertown	54S-38S-9	3	4/1	35	I
	6704	Hayes Road	58S-37E-22	4	4/27	1	I
*	6705	J. D. Barnes	57S-37E-9	5	5/10	1	I
	6706	Arson #1	58S-37E-11	6	5/22	1	I
	6707	Australian Pine	54S-36E-24	7	5/22	1	I
	6708	The Pillow Fire	58S-35E-4	8	5/28	.001	I
*	6709	Coopertown #2	54S-38E-9	9	5/30	65	L
	6710	S-12-D Lightning	54S-36E-24	10	5/31	1	L
	6711	LPK Campground and Picnic Area	58S-37E-7	No #	6/27	30.3	P
	6712	Pine Island	58S-37E-?	No #	7/21	34.4	P
	6713	Sisal Pond	58S-36E-30	11	8/26	8	L
	6714	Block B	58S-37E-7	No #	12/10	1500	P
	6715	Tower Roadside	58S-37E-7	12	12/22	1	I

1968

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6801	Raul Quires Uncontrolled Burn	55S-38E-15	1	1/1	5	I
*	6802	Marvin Shaw Refuse Burn	55S-37E-18	2	1/29	1	I
*	6803	Suburban Acres #2	55S-38E-21	3	2/3	84	I
	6804	Heartburn	58S-37E-1	4	2/16	29	I
	6805	Headache	58S-37E-12	5	2/28	150	I
*	6806	Suburban Acres #3	55S-38E-21	6	3/17	1	I
	6807	Rocky Creek	56S-33E-20	7	3/23	200	I
*	6808	Broiled Chicken	55S-38E-14	8	3/24	70	I
	6809	Indian Camp Creek	56S-33E-36	9	3/25	40	I
	6810	Basket	58S-36E-26	10	4/29	.001	I
	6811	Whitney's Fire	58S-37E-18	11	4/29	13	I
*	6812	Broiled Chicken #2	55S-38E-14	12	5/17	45	I
*	6813	Mickey Mouse	57S-38E-31	13	6/14	356	L
	6814	Lower Taylor Slough	60S-36E-12	17	7/29	200	L
	6815	Upper Broad River	57S-33E-20	18	8/12	225	L
*	6816	Kacer's Welcome	55S-38E-32	19	11/29	250	I
	6817	Blocks V & W	58S-37E-13	No #	12/4	66	P
	6818	Block P	58S-37E-13	Y-14	12/6	3	P
*	6819	Sportsman Fire # 1	NA	20	12/8	10	I
	6820	Blocks T, T_I	58S-37E-13	No #	12/17	33	P
	6821	Blocks R & S	58S-37E-13	No #	12/18	28	P
	6822	Dew Drop	NA	14	6/26	1	L
	6823	No Sweat	NA	15	6/29	1	L
	6824	No Name	NA	16	6/30 est.	7	L

1969

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	6901	Suburban Mud	55S-38E-11	1	1/19	3	I
*	6902	Surprise	57S-38E-32	2	2/2	150	I
*	6903	Amacha Acres	55S- -21	5	4/18	35	I
	6904	Block F	58S-37E-7	No #	4/23	875	P
	6905	Block E	58S-37E-5	No #	4/24	1050	P
	6906	Bad News Fire	57S-37E-30	6	4/24	765	I
	6907	Block T_{II}	58S-37E-13	No #	12/2	25	P
	6908	Blks. K, L, M, N, O	58S-37E-1	No #	12/4	368	P
	6909	Block G	58S-37E-6	No #	12/10	800	P
	6910	Block Y	58S-37E-12	No #	12/12	37	P
	6911	No Name	NA[1]	No #	12/15	Unknown	P
	6912	Green Banana Fire (Block I)	58S-37E-7	8	12/23	650	I

[1]Record is poor but it does show:

"15th grass east of Taylor Slough-south of main park road"
"16th grass east of Taylor Slough-north of main park road"
"17th grass west of Taylor Slough-south of main park road."

1970

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	7001	Devil's Tower	57S-38E-7	1	5/17	671	I
	7002	Alligator Bay	55S-32E-19	2	6/13	110	I
	7003	Otter Creek	58S-33E-1	3	7/6	30	L
	7004	Block U	58S-37E-12	No #	7/28	17	P
*	7005	John Chisum	57S-38E-12	4	8/2	.1	I
	7006	Barnes Booboo	58S-37E-?	5	9/3	24	I
	7007	Block V_I	58S-37E-12	No #	11/12	22	P
	7008	Fried Tomato	58S-37E-36	8	11/18	2568	I
*	7009	Paul Revere	54S-37E-7	9	11/24	120	I
*	7010	Haskell's Surprise	55S-38E-18	10	12/19	37	I
		Prescribed fire in sawgrass west of Shark Valley (Memo from Klukas to Superintendent).			12/21	120	P

1971

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7101	Last Day Fire	58S-36E-33	1	1/3	120	I
*	7102	Phil's Folly	55S-38E-11	2	1/9	26	I
	7103	N. 1/3 Shark Valley Slough	NA	No #	2/17	26	I
	7104	Iron Pot to 40 mi Bend	NA	No #	2/?	2400	P
*	7105	Smool Joe Fire	56S-37E-7	5	2/11	2100	I
*	7106	Last Chance Fire	56S-37E-?	6	est 2/16	1600	I
	7107	Middle 1/3 Shark Valley Slough	NA	No #	3/?	3 strands	P
*	7108	Polack's Fire	NA	7	3/14	25	I
*	7109	Trainee	55S-38E-21	9	3/18	390	I
*	7110	Powder Keg	54S-38E-10	10	3/23	25	I
*	7111	Old Kentucky	55S-38E-33	11	3/27	69	I
*	7112	Hawk Site Fire	NA	C-1	3/27	320	I
*	7113	Coopertown Pair Fire	54S-38E-11	12	4/3	360	I
*	7114	Bad Luck Fire	54S-34E-20	13	4/8	1850	I
*	7115	Gotcha Fire	54S-37E-?	14	4/11	43150	I
*	7116	Tamiami Tr.-Krome Ave.	54S-37E-?	C-2	4/30	31365	Unknown
	7117	Scorched Donut	58S-36E-25	17	5/10	100	I
	7118	Hair Fire	58S-35E-24	18	5/13	300	L
	7119	Cape Sable	NA	71-1	6/8	240	P
	7120	Block U	58S-37E-12	P-1-71	7/28	17	P
	7121	Blocks V & X	58S-37E-12	P-2-71	8/18	62	P
	7122	Roadside	NA	G-1-71	9/9	Unk.	P
	7123	Block C	58S-36E-15	P-3-71	9/10	300	P
	7124	Royal Palm 71-1	NA	G-1	9/24	50	P

1971 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7125	Block Q	58S-37E-13	P-4-Q	9/27	690	P
	7126	Wildfire #1	58S-36E-29	No #	10/1	2	I
	7127	Wildfire #2	59S-36E-18	No #	10/1	200-300	I
	7128	Shark Valley '71	NA	G-3	10/6	245	P
	7129	Block A	58S-36E-21	P-5-71	10/7	2250	P
	7130	Block Y	59S-37E-12	P-6-71	10/14	27	P
	7131	Wildfire #3	NA	No #	10/20	250	I
	7132	Payhayokee	58S-35E-1	G-5-71	10/29	187	P
	7133	LPK Campground	58S-37E-7	P-7-71	11/5	20	P
	7134	East Boundary Burn	NA	G-8-71	11/8	2530	P
	7135	Blocks R & S	58S-37E-13	P-8-71	11/11	32	P
	7136	Block J	58S-37E-9	P-9-71	11/18	800	P
	7137	Rosie	58S-37E-18	21	11/21	205	I
	7138	Missile Base, Unit 2	NA	G-9-71	11/24	10-15	P
*	7139	Frambo Trail	57S-37E-8	22	11/27	300	I
	7140	L-67 to L-31W	NA	No #	12/7	1500	P
	7141	The Chief	58½S-36E-3	24	12/19	1200	I
	7142	(no name given)	NA	3	1/30	.5	I
	7143	(no name given)	NA	4	2/5	.5	I
	7144	(no name given)	NA	8	3/17	3	I
	7145	(no name given)	NA	15	4/26	1	I
	7146	(no name given)	NA	16	5/4	1	I
	7147	(no name given)	NA	19	5/18	1	I
*	7148	(no name given)	NA	20	6/3	9	L
	7149	(no name given)	NA	23	12/2	7	I

1972

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	7201	Big John	58S-38E-19	1	1/11	981	I
*	7202	Big John Fire #2	58S-38E-30	2	1/21	2600	I
	7203	Park Line	58S-36E-29	3	1/31	45	I
	7204	E. Boundary	NA	G-2-72	2/11	44	P
	7205	Blocks T, T_I	58S-37E-13	P-1-72	2/14	44	P
*	7206	Iron Grate	55S-37E-18	4	2/19	370	I
	7207	Phantom	58S-35E-24	5	2/20	15260	I
	7208	Seven Eleven	58S-37E-28	6	2/26	575	I
*	7209	W. Boundary	54S-34E-30	7	2/28	125	I
	7210	Pa-Hay-Okee	NA	8	2/28	4	I
	7211	Block G	58S-37E-11	No #	3/1	627	P
*	7212	Forest Service	55S-38E-15	9	3/2	250	I
*	7213	Hay Stack	55S-38E-21	10	3/4	20	I
*	7214	Plummer	NA	11	3/13	8	I
	7215	Camp Lonesome	57S-33E-23	12	3/18	20	I
	7216	Blocks N & O	58S-37E-10	No #	3/20	40	P
*	7217	Iron Grate #2	NA	13	3/20	9	I
*	7218	Trash	55S-38E-16	14	3/28	390	I
*	7219	High Noon	54S-38E-33	15	3/29	2130	I
	7220	Farmland Iori's, Unit 2	58S-37E-15	72-1	4/21	45	P
	7221	A. Pine	59S-38E-29	72-1	5/3	7	P
	7222	A Pine	61S-32E-5	72-2	5/9	5	P
	7223	A Pine	59S-39E-3	72-3	5/17	2	P

1972 (cont)

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7224	A Pine	57S-31E-15	72-4	5/18	5	P
7225	Leaping Lawrence	58S-34E-17	16 & 6 L	6/15	61	L
7226	Block SI	58S-37E-13	No #	9/21	11	P
7227	Block T III	58S-37E-14	No #	9/29	15	P
7228	Block G, Taylor Slough	58S-37E-14	# 2	10/6	65	P
7229	Block T II	58S-37E-13	No #	10/9	25	P
7230	Block Y	58S-37E-12	No #	10/10	37	P
7231	Block K	58S-37E-11	No #	10/11	5	P
7232	Middle 1/3 SV Slough	NA	No #	10/15	1 strand	P
7233	Block M	58S-37E-1	#3-5	10/27	20	P
7234	Block G, Taylor Slough West	58S-37E-14	No #	11/1	245	P
7235	(Rodger's River) Headwater Marsh	56S-33E-34	72-1	11/2	400	P
7236	End of L-67	55S-36½E-36	No #	11/3	1	P
7237	Block H	58S-37E-4	No #	11/16	750	P
7238	Block P	58S-37E-13	No #	12/1	3.5	P
7239	Block B	58S-36E-14	No #	12/7	1300	P
7240	Block S II	38S-37E-13	No #	12/10	6	P
7241	Fox Lake	60S-33E-20	72-1	12/13	12	P
7242	Block K, N of Ent. Sta.	58S-37E-12	No #	12/20	3	P

1972 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
Note: There are 31 fires on an overlay map and in a 1972 Wildfire Summary for which no fire report was found (7243 through 7273).							
	7243	L-67 Canal	54S-36½E-?	72-1L	5/28	33	L
	7244	L-67	54S-36½E-?	72-2L	5/28	22	L
	7245	L-67	54S-36½E-?	72-3l	5/28	17	L
	7246	L-67	54S-36½E-?	72-4L	5/28	75	L
	7247	Roger's River Camp	56S-33E-34	72-5L	6/13	27.5	L
	7248	W. Boundary	NA	72-7L	6/14	39	L
	7249	1/2 mi. N of HQ	57S-37E-28	72-8L	7/3	1	L
	7250	Cypress	NA	72-9L	6/30	1	L
	7251	NW end of Blk H	NA	72-10L	6/30	1	L
	7252	Otter Creek	NA	72-11L	7/6	330	L
	7253	Rodgers Riv.	57S-33E-23	72-12L	7/6	110	L
	7254	No Name	NA	72-13L	7/6	15	L
	7255	Block H 1/4 mi. S. of Osteen	57S-37E-4	72-14L	7/11	1	L
	7256	Block I	58S-37E-8	72-15L	7/12	1	L
	7257	1-1/2 mi. E. of #12L	57S-33E-24	72-16L	7/6	.5	L
	7258	10 Mile Corner	55S-35E-6	72-17L	8/17	4	L
*	7259	E. Boundary	57S-37E-16	72-18L	8/17	3	L
*	7260	E. Boundary #2	57S-37E-4	72-19L	8/17	100	L
	7261	11 Mi. Rd.	58S-36E-12	72-20L	8/19	25	L
	7262	Hole-in-Donut	59S-36E-33	72-21L	9/15	50	L
	7263	Ingraham Hwy.	58S-36E-?	72-22L	9/15	175	L

1972 (cont)

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7264	9-Mile Pond	59S-35E-?	72-23L	9/22	62	L
7265	W. Lake, N. of Cuthbert	59S-35E-?	72-24L	9/22	44	L
7266	W. of SV Tower	55S-35E-?	72-25L	9/23	40	L
7267	4 Mi. So. of #22L	59S-35E-?	72-26L	9/13	21	L
7268	Indian Camp Creek	NA	No #	11/10	100	L
7269	W. Boundary	NA	No #	11/18	100	I
7270	N of MPR on L-31W	58S-37E-?	72-27L	8/?	1	L
7271	LPK C'Ground	58S-37E-7	72-28L	8/?	1	L
7272	Pine Blocks	58S-36E-?	72-29L	8/?	1	L
7273	Pine Blocks	NA	72-30L	9/?	1	L
7274	Sawgrass	55S-35E-19	17	11/18	100	I

1973

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7301	SG #5	54S-36E-19	73-1	1/3	20	P
	7302	Boy Scout Camp	58S-37E-17	No #	1/5	100	P
	7303	West Boundary	54S-35E-27	2a-4	1/10	75	P
	7304	West Boundary	54S-35E-27	2a-6	1/16	100	P
	7305	SG #6	55S-36E-31	73-1	1/18	25	P
	7306	West Boundary	54S-35E-27	2a-8	1/19	75	P
	7307	West Boundary	54S-35E-27	2a-9	1/23	250	P
	7308	West Boundary	54S-35E-27	2a-10 & 2a-11	1/27	175	P
	7309	West Boundary	54S-35E-27	2a-13	1/30	1500	P
	7310	Farmland-Ioris, Unit 2	58S-36E-26	73-1	1/30	25	P
	7311	Headwater Marsh (Cp. Lonesome)	57S-33E-23	73-1	1/30	22	P
	7312	A. Pine (Highland Beach)	57S-31E-3	73-1	1/31	50	P
	7313	Farmland Ioris, Unit 2	58S-36E-26	73-2	2/4	10	P
	7314	Missile Base, Unit 2	NA	73-1	2/6	270	P
	7315	SG #7	55S-36E-29	73-1	2/7	100	P
	7316	Shark Valley Rd. to L-67	NA	No #	2/9	450	P
	7317	Farmland Ioris, Unit 2	58S-36E-26	73-3	2/11	20	P
	7318	Missile Base	58S-36E-25	73-3	2/13	138	P
	7319	Headwater Marsh (Broad River)	57S-32E-19	73-2	2/20	28	P
	7320	Missile Base, Unit 2	58S-36E-25	73-3	2/28	20	P
	7321	West Boundary	54S-35E-20	2a-15	3/2	240	P
	7322	A. Pine	59S-38E-29	73-2	3/4	15	P
*	7323	S. Council Tower #1	56S-37E-24	4	3/11	407	I

1973 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
*	7324	S. Council Lower #2	56S-38E-31	5	3/13	110	I
	7325	A. Pine	59S-39E-?	73-3	3/14	60	P
	7326	Missile Base, Unit 2	58S-36E-26	73-4	3/15	5	P
	7327	West Boundary fm P34 to Iron Pot	55S-34E-?	2a-16	3/18	6468	P
*	7328	Grossman at Council Tower	NA	7	3/19	800	I
	7329	Royal Palm	58S-37E-15	73-1	3/19	12	P
	7330	Missile Base, Unit 2	58S-36E-26	73-5	3/29	200	P
	7331	South of the Donut	NA	9	3/30	2900	I
	7332	Missile Base, Unit 2	58S-36E-26	73-6	4/5	25	P
	7333	Missile Base, Unit 2	58S-36E-26	73-7	4/11	900	P
	7334	Shark Valley	55S-36E-19	73-1	4/17	35	P
	7335	Flamingo #1	60S-34E-5	73-1	4/23	28	P
	7336	SG #9b	55S-36E-31	No #	4/25	2	P
	7337	Flamingo #2	60S-34E-5	73-2	5/2	5	P
*	7338	Council Rd. West, East L-67	55S-37E-2	15	5/6	1000	I
	7339	A. Pine, (Indian Key Pass)	NA	73-4	5/7	20	P
*	7340	County Line	54S-35E-19	16	5/12	1500	I
*	7341	Coopertown	54S-37E-7	17	5/14	35000	I
	7342	John Willie's	54S-35E-20	18	5/22	70	I
	7343	A. Pine (Highland Beach, South End)	57S-31E-26	73-5	5/29	35	P
	7344	Taylor Slough	59S-37E-9	19 (L-1)	6/7	16	L
*	7345	S. Council Tower #3	56S-37E-?	20	6/12	3187	I
	7346	Cattail Lake	60S-32E-14	21 (L-2)	6/14	22	L

1973 (cont)

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7347	Shark Valley Tower	55S-36E-31	30 (L-5)	7/7	.2	L
7348	Hell's Bay Fire	60S-35E-7	27 (L-4)	7/10	22	L
7349	L-67 No. 1	54S-36E-?	28 (L-3)	7/11	38	L
7350	L-67 No. 2	54S-36E-36	29 (L-6)	7/14	17	L
7351	Lostman's Slough	56S-31E-36	25 (L-8)	7/19	104	L
7352	Rodger's River	57S-32E-20	26 (L-7)	7/19	311	L
7353	Broad River South	57S-32E-29	31 (L-9)	7/26	38	L
7354	Clearwater	56S-34E-35	32 (L-10)	8/5	250	L
7355	Headwater Marsh (Squaw Creek)	58S-34E-21	73-3	8/19	49.5	P
7356	Horse Fly Hammock	56S-34E-10	38 (L-16)	10/9	82	L
7357	A. Pine (Eagle Key, East Side)	60S-37E-?	73-6	10/10	.25	P
7358	S.G. #10	55S-36E-29	73-1	10/11	50	P
7359	LPK Campground, Picnic Area, Loops ABCD	58S-37E-7	No #	10/18	16.56	P
7360	Blocks V & W	58S-37E-13	No #	10/25	309	P
7361	Farmland Unit II	58S-36E-28	73-1	10/30	15	P
7362	Farmland Unit IV	56S-37E-18	40	11/2	101	I
7363	Fox Lake	60S-33E-16	73-1	11/6	203	P
7364	Farmland Unit III	58S-36E-26	73-1	11/8	25	P
7365	SG #11	55S-36E-29	73-1	11/21	18	P
7366	SG #11	55S-36E-32	73-2	11/21	20	P
7367	Block Q	58S-37E-13	No #	11/27	20	P
7368	Block V	58S-37E-12	No #	11/30	6	P
7369	Block D	57S-36½E-?	No #	12/14	1.5	P
7370	Block G	58S-37E-6	3-7	12/18	266	P

1973 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7371	SG #12	55S-36E-31	73-1	12/19	103	P

Note: Fires on an overlay map and in Wildfire Summary for 1973; no fire reports found (7372 through 7391).

*	7372	Aerojet South	NA	73-1	2/6	9	I
*	7373	Farm Rd. Gate	NA	73-2	3/1	.2	I
	7374	Wood Key	NA	73-3	3/10	15	I
	7375	Missile Base East	NA	73-6	3/19	6	I
	7376	Missile Base East	NA	73-8	3/25	1.6	I
	7377	W. of L-67	NA	73-10	4/6	.25	I
	7378	Tamiami Garbage Dump	NA	73-11	4/18	.25	I
	7379	Taylor Slough	NA	73-12	4/20	.25	I
*	7380	Council Tower	NA	73-13	1/1	3	I
	7381	Hole in Donut	NA	73-14	1/1	8	I
*	7382	Tamiami Trail	NA	73-22	6/13	.25	I
*	7383	Tamiami Trail	NA	73-23	6/13	.25	I
*	7384	Tamiami Trail	NA	73-24	6/13	.25	I
	7385	1/4 mi NW of Joe Ree Hammock	NA	73-33 (L-11)	8/10	3	L
	7386	Roger's Creek	NA	73-34 (L-12)	8/1	.5	L
*	7387	P-34	NA	73-35 (L-13)	8/18	4	L
	7388	Panther Mound	NA	73-36 (L-14)	8/11	2	L
	7389	South of Tower	NA	73-37 (L-15)	9/15	.25	L
	7390	Panther Fire	NA	73-39 (L-17)	10/10	1	L
	7391	Turner River	NA	73-41	12/27	Unknown	Unknown

1974

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7401	East Boundary	56S-36½E-1	#2-2	1/8	1247	P
	7402	High Rocks	56S-36E-24	1	1/14	200	I
	7403	Blocks K & L	58S-37E-1	No #	1/21	1284	P
	7404	N. of MPR	58S-36E-1	74-1	1/22	106.8	P
	7405	Fox Lake	60S-33E-16	74-1	1/23	100	P
	7406	Royal Palm	58S-37E-10	74-1	1/29	15	P
	7407	SG #13 Sea Grape Mound	54S-36E-32	74-1	1/30	61	P
	7408	SG #13 Sea Grape Hammock	55S-36E-28	74-2	1/30	61	P
	7409	Big Ficus	58S-35E-4	2	2/1	60	I
	7410	Block M & E. Boundary	58S-37E-1	No #	2/5	28	P
B	7411	5 Mile Corner	57S-35E-36	3	2/5	1685	P
	7412	A. Pine	(Indian Key Pass)	74-1	2/6	5	P
	7413	Block D	57S-36½E-31	No #	2/12	1	P
	7414	A. Pine	57S-31E-36	74-2	2/12	Unknown	P
	7415	Rocky Creek	56S-33E-19	4	2/14	91	I
	7416	SG #14	56S-35E-16	74-1	2/20	274	P
	7417	SG #14	56S-35E-25	74-2	2/20	Unknown	P
	7418	A. Pine	61S-38E-?	74-3	2/20	1	P
	7419	Block Q	58S-37E-5	No #	2/21	700	P
	7420	Block W East Side	58S-37E-12	No #	2/26	6.7	P
*	7421	Lucille Fire	57S-37E-15	5	3/3	2447	I
	7422	NW Park Boundary, Shark Valley	55S-35E-17	#2(10)74	3/12	8500	P
	7423	A. Pine	(Indian Key Pass)	74-4	3/12	Unknown	P

1974 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7424	SG #15	NA	74-1	3/25	625	P
	7425	Blocks J, H & I, Taylor Slough and Blk. G	58S-37E-9	6	3/28	2025	I
	7426	Flamingo	60S-34E-5	74-1	3/29	1	P
	7427	A. Pine	NA	74-5	4/2	Unknown	P
*	7428	Binky	55S-34E-24	7	4/7	63727	I
	7429	A. Pine	57S-31E-3	74-6	4/9	Unknown	P
	7430	Iori's	59S-36E-17	8	4/10	Unknown	I
	7431	Flamingo	NA	No #	4/23	28	P
	7432	Rock Reef	58S-36E-8	9	4/26	20	I
	7433	Block H	57S-37E-18	10	4/27	1	I
B	7434	Aero-Jet 74	58S-38E-4	11	4/27	14026	I
	7435	Unit Four	58S-37E-18	12	5/1	31	I
B	7436	Gator Den	54S-36E-31	13	5/4	13005	I
	7437	Farmland Unit III	NA	74-1	5/24	10	P
	7438	Cuthbert	59½S-35E-?	14	5/29	153	L
	7439	Sweet Bay	59S-35E-14	15	6/3	225	L
	7440	N. Harney Marsh	58S-33E-5	16	6/12	83	L
	7441	Ficus Pond	58S-35E-33	17	6/13	1	L
	7442	Regulator	54S-36E-23	18	6/18	1	I
	7443	Johnny Buck	56S-36E-2	19	6/19	9	L
	7444	Dry Soil Fire	56S-34E-27	29	6/21	5234	L
	7445	P-36	57S-34E-28	20	6/21	7	L
	7446	Broad River	57S-32E-33	21	8/11	228	L

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7447	Tarpon Bay	58S-33E-10	23	8/17	.5	L
7448	Avocado Creek	58S-33E-11	22	8/20	17	L
7449	Taylor Slough	57S-37E-23	24	8/26	2234	L
7450	Pine Glade	58S-36E-3	25	9/28	220	L
7451	SG #1 Willoughby	55S-36E-32	74-1	10/3	10	P
7452	SG #1	55S-36E-29	74-2	10/3	10	P
7453	Farmland Unit IV	58S-37E-18	74-1	11/1	.1	P
7454	Farmland Unit III	58S-36E-26	74-2	11/1	10	P
7455	Farmland Unit III	58S-36E-26	74-3	11/1	10	P
7456	LPK Campground	58S-37E-7	No #	11/7	21	P
7457	Block Y	58S-37E-12	No #	11/7	25	P
7458	Levee 31-W (Block M)	57S-37E-1	26	11/17	2	I
7459	Royal Palm	58S-37E-14	74-2	11/19	217	P
7460	Royal Palm	NA	74-3	11/19	124.8	P
7461	East Boundary	56S-36½E-?	No #	11/20	1	P
7462	A Battery	58S-36½E-?	27	11/20	1	I
7463	Wildfire (Block F)	58S-37E-7	28	11/23	741	I

1975

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7501	Cape Sable	61S-32E-9	1	1/3	1	I
	7502	Farmland Reclamation Unit 8	58S-37E-19	75-1	1/7	22	P
	7503	Block F	58S-37E-6	No #	1/8	83	P
	7504	Pine Blocks A, C, D, E	58S-36E-10	No #	1/14	3895	P
	7505	Farmland Unit II	58S-36E-28	75-1	1/14	5	P
	7506	LPK Farm Rd.	58S-36E-26	2	1/17	1	I
	7507	Gate 1a (Block J South)	58S-37E-16	3	2/4	1	I
	7508	Johnny Buck & Panther Mound SG #2 & SG #16	55S-36E-28	75-1	2/5	475	P
	7509	SG #3	56S-36E-29	75-1	2/5	461	P
B	7510	Hofstetter Burn	55S-36½E-?	No #	2/11	47	P
	7511	Mahogany Hammock	59S-35E-20	75-1	2/11	26	P
	7512	Iori	58S-36E-25	75-1b	2/27	1	I
	7513	Downrange (Unit 5)	58S-36E-36	2	3/1	1	I
	7514	Block A (E. half)	58S-36E-21	No #	3/3	788	P
	7515	A. Pine	NA	75-1	3/4	Unk.	P
	7516	Boy Scout Camp	58S-37E-17	No #	3/6	138	P
	7517	Mahogany	58½S-35E-18	2a	3/6	1	I
	7518	E. Boundary South of ERTS.	56S-36½E-6	No #	3/6	648	P
	7519	Buttonwood	60S-34E-32	1a	3/7	1	I
	7520	West Boundary	55S-34E-9	2-G-75	3/20	698	P
	7521	Farmland Unit III	58S-36E-25	75-1	3/24	5	P
	7522	Mahogany (North)	58½S-35E-9	3	3/26	586	I
B	7523	Context	57S-37E-1	4	3/27	32920	I

1975 (cont)

	Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
	7524	Farmland Unit IV	NA	75-1	3/28	120	P
	7525	Gate 2	58S-37E-8	5	4/8	4	I
	7526	Farmland Unit I		75-1	4/14	3	P
	7527	East Boundary, Block M	58S-37E-1	No #	4/17	23.27	P
	7528	Farmland Unit II	58S-36E-28	75-2	4/23	8	P
B	7529	Gum Slough	54S-31E-3	6	4/24	28286	I
	7530	SG #9b	NA	75-1	4/25	1.5	P
	7531	Flamingo	61S-34E-4	75-1	4/30	28	P
	7532	Farmland Unit III & Unit IX	58S-36E-26	75-2	4/30	120	P
	7533	Paw Paw SG #4	57S-35E-22	75-7	5/8	224	L
	7534	Farmland Unit V	58S-37E-16	No #	4/18	100	P
	7535	Rookery Gate	58S-34E-3	8	5/24	45	L
	7536	Dozier Trail	58S-36E-17	9	5/25	1686	L
	7537	Little Fox	60S-33E-17	10	6/5	222	L
	7538	Rodgers River	57S-32E-5	11	6/5	2161	L
	7539	Broad Marsh	57S-32E-28	12	6/6	1	L
	7540	Johnny Buck Strand	56S-32E-31	13	6/6	1	L
	7541	Farmland Unit I	58S-37E-15	75-3	6/10	1.5	P
	7542	Fish Hook	58S-36E-33	14	6/13	12	L
	7543	Royal Palm	58S-35E-20	15	6/13	30	L
	7544	Joe Ree	58S-35E-9	16	6/15	160	L
	7545	Lostman's	56S-31E-25	17	6/15	2960	L
	7546	Broad Lake	57S-32E-24	18	6/17	428	L
	7547	Horned Slou	57S-37E-28	19	6/24	137	L

1975 (cont)

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7548	Madiera Slou	59S-37E-9	20	6/29	9	L
7549	Graveyard	58S-33E-19	21	6/29	324	L
7550	Gator Bay	56S-32E-1	23	6/29	41	L
7551	Big Ficus Strand	58S-35E-33	22	7/1	8	L
7552	Royal Palm Jct.	58S-37E-3	24	7/5	1	L
7553	Jennings Pl.	59S-33E-20	25	7/7	687	L
7554	Far East	59½S-36E-?	26	7/10	29	L
7555	Wood River	57S-33E-30	27	7/10	6	L
7556	Block M	58S-37E-1	No #	7/18	23	P
7557	Block R, behind Qtrs #111	58S-37E-13	No #	7/23	18	P
7558	Sisal Fire	58S-35E-36	28	8/17	73	L
7559	Pine Island	58S-37E-11	29	8/18	277	L
7560	Demo Strike	59S-35E-17	30	8/30	1	L
7561	Block B (8 burns)	58S-36E-14	No #	9/10 (thru 11/15)	503	P
7562	Cattail	60S-32E-16	31	10/1	199	L
7563	L-67	54S-36½E-?	32	10/1	1	L
7564	Block T	58S-37E-13	No #	10/3	52	P
7565	N. of Main Park Rd.	58S-35E-14	75-1	10/6	246.5	P
7566	Ficus	58½S-35E-4	33	10/10	1	L
7567	SG #10	55S-36E-32	75-1	10/11	45	P
7568	L-67 to L-31W	NA	No #	11/10	78	P
7569	Cannon	55S-32E-7	34	11/10	12	I

1975 (cont)

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7570	Farmland Reclamation, Units 4, 5, 6, 7, 8	58S-37E-16	75-2	11/11	1860	P
7571	Pine Blocks S, M, N, O, P	58S-37E-12	No #	11/17	117	P
7572	Farmland Reclamation (Unit 3, 9, 10)	58S-36E-26	75-3	11/26	119	P
7573	East Boundary	57S-36½E-?	No #	12/1	525	P
7574	Farmland Reclamation, Unit 3	58S-36½-25	75-4	12/3	70	P
7575	Block G	58S-37E-6	No #	12/11	155	P

1976

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7601	SG #40 (Paw Paw Mound)	57S-36E-19		?	249	P
7602	Shark Slough	57S-35E-2	No #	1/20	1569	P
7603	Farmland Unit I	58S-37E-15	76-1	1/26	1.2	P
7604	Farmland Reclamation, Unit 8	58S-37E-19	76-1	1/27	90	P
7605	Donut West, Unit 3	58S-36E-29	1	1/29	8	I
7606	Hayes Barn Pines	58S-36E-12	76-2	2/21	11	P
7607	SV Rd. to L-67	57S-36E-20	No #	2/23	175	P
7608	Mahogany Hammock and MPR	58S-35E-15	76-1	3/4	165.6	P
7609	Ingraham	58S-37E-32	2	3/12	13477	I
7610	Farmland Units 4, 5	58S-37E-18	76-3	4/3	130	P
7611	Dark (Block J, Gate 1)	58S-37E-10	3	5/12	30	L
7612	Farmland Units 3, 9	58S-36E-26	76-2-15 & 76-4	5/14	560	P
7613	Lonesome	57S-33E-23	4	5/27	8	L
7614	Canal	54S-36½E-25	5	7/28	9	L
7615	Old Farm	59S-36E-17	6	8/6	38	L
7616	Broad	57S-33E-23	5N	8/17	7	L
7617	Donut One Units 4, 6, 8	58S-37E-19	76-5	10/21	640	P
7618	Donut Two, Units 4, 6, 7, 8	58S-37E-19	M-20	11/2	562	P
7619	Ingraham Hwy South	59S-36E-17	76-1	11/76	103	P
7620	Panther Glade	57S-37E-31	M-21	11/23	400	P
7621	Pine Glade Lake	57S-36E-8	M-22	11/23	835	P
7622	Block H	57S-37E-5	M-26	11/26	175	P
7623	Blocks U, V, W, X	58S-37E-13	M-24	12/8	404	P
7624	Blocks K, L, M	58S-37E-11	M-25	12/9	779	P
7625	Block Q	58S-37E-14	M-23	12/9	16	P
7626	Donut Three, Unit 3	58S-37E-19	76-7 & M-27	12/10	95	P

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7701	Block B	58S-36E-22	M-1	1/12	758	P
7702	Block H (& I)	58S-37E-4	M /W-1	1/26	664	P
7703	Units 1, 4, 5, Farmland Reclamation	58S-37E-16	M-4	2/2	510	P
7704	Unit III	NA	M-3	2/6	1	I
7705	Broad River	57S-32E-21	R-1	2/22	60	P
7706	Unit Four (Donut)	58S-37E-18	M-5	2/25	150	P
7707	Pumphouse	58S-37E-6	W-2	3/6	1	I
7708	Flamingo	61S-34E-4	M-6	3/18	28	P
7709	Block H III	58S-37E-5	R-2	4/2	27	P
7710	Faux Pas	54S-35E-22	W-3	4/3	5	I
7711	Kitten	54S-35E-22	W-4	4/3	2	I
7712	Cuthbert	60S-36E-7	N-1	5/10	4	L
7713	9 Mile 77	60S-35E-3	N-2	5/25	2	L
7714	King Corey	58S-36E-8	N-3	7/5	1	L
7715	W. Sweet Bay	58½S-35E-15	N-4	7/10	1	L
7716	Wood	57S-32E-36	N-5	7/31	364	L
7717	Taylor Slew	NA	N-6	8/8	.5	L
7718	Farmland Unit IV	58S-37E-19	77-1	11/9	4	P
7719	East Boundary	57S-37E-19	M-8	12/22	3877	P

1978

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7801	L-31W	58S-37E-12	W /M-1	1/15	1	I
7802	Block D	57S-37E-30	M-2	3/30	787	P
7803	Walden	54S-36E-24	W/M-3	6/16	120	I
7804	Canal Fire	55S-36½E-Hiatus	N-1	6/25	26	L
7805	Crash Site	56S-34E-24	N-2	6/25	726	L
7806	North River	58½-34E-Hiatus	N-3	6/29	1	L
7807	Gator Slough I	56S-35E-16	N-4	8/1	2	L
7808	Cocoanut Hammock	56S-33E-9	N-6	8/2	30	L
7809	Broad River	57S-33E-22	N-5	8/3	105	L
7810	Pine Island	58S-37E-?	N-7	8/5	1	L
7811	Overlook	58S-36E-?	N-8	9/9	26	L
7812	LPK Campground	58S-37E-7	M-4	9/19	38	P
7813	Gator Creek	55S-31E-13	N-9	9/21	9	L
7814	Unit 1-C	58S-37E-21	W /M-5	11/21	60	P
7815	East Boundary	56S-37E-31	M-6	12/7	402	P
7816	Blocks N & O	58S-37E-11	M-1 (79)	12/12	100	P
7817	Research #1	58S-37E-3	R-1	12/14	161	P
7818	Block J	58S-37E-9	M-2 (79)	12/18	132	P

1979

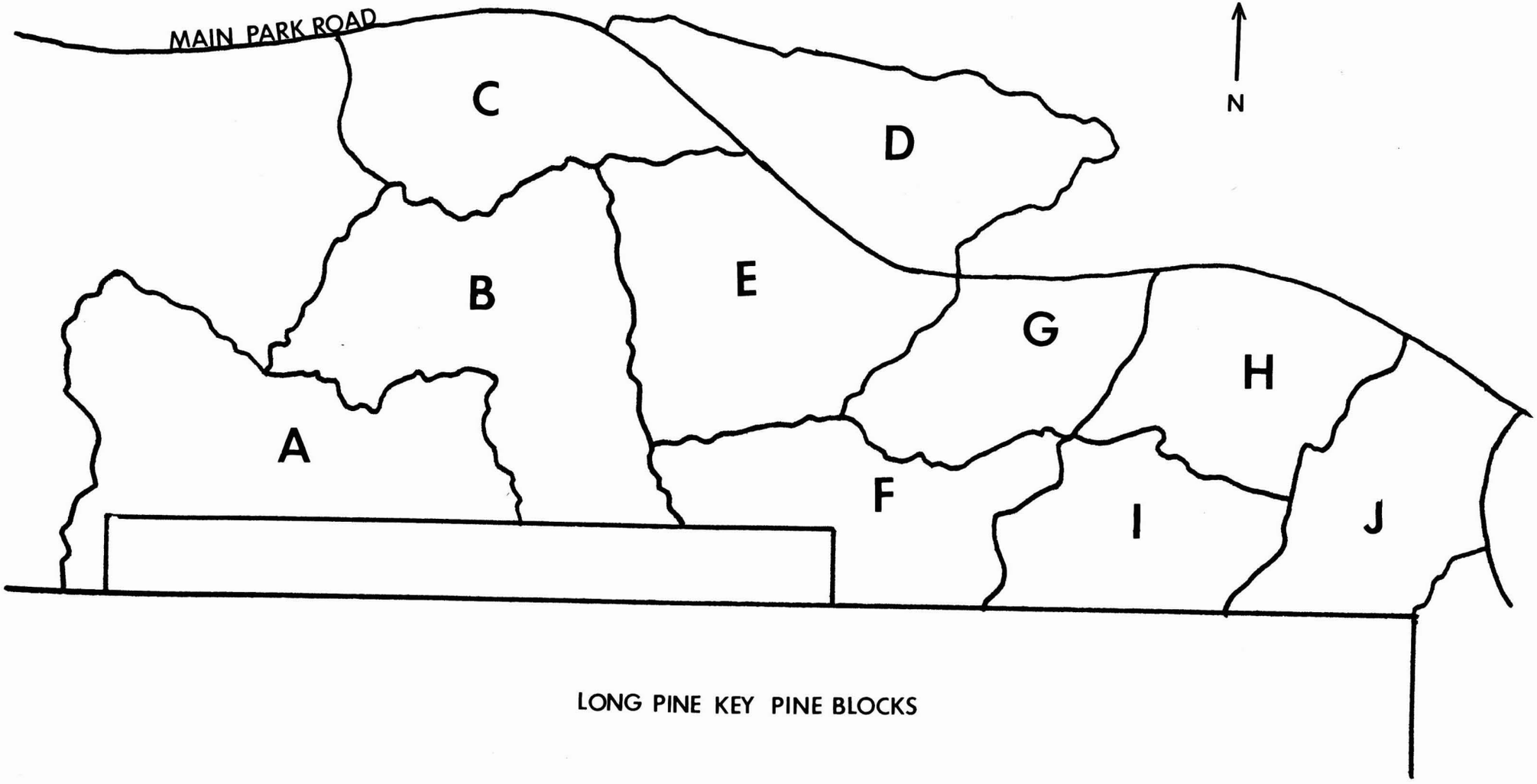
Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7901	Block Y	58S-37E-12	M-3	1/4	9	P
7902	Hell's Acre	52S-30E-22	W/M-5	1/8	15	I
7903	Pines NW of Block D	58S-36E-7	M-4	1/16	580	P
7904	Miccosukee	54S-35E-22	M-6	2/6	216	P
7905	Research #2	58S-37E-3	R-1	3/7	127	P
7906	N. Boundary	54S-36½E-1	M-7	3/15	403	P
7907	Campsite 98	58S-37E-7	W-1	4/9	1	I
7908	Donut Unit 8	58S-37E-19	M-8	4/18	40	P
7909	Gator Hook	54S-31E-14	W/M-9	5/4	3	I
7910	Structure C	54S-36E-34	N-1	6/22	.75	L
7911	Atoll Hammock	59S-36E-17	N-2	7/1	218	L
7912	Panther Mound	56S-36E-29	N-3	7/12	1	L
7913	McLaughlin	57S-32E-6	N-4	7/16	288	L
7914	Onion Key	56S-32E-7	N-5	7/16	162	L
7915	Research #3	57S-37E-31	R-M-1	7/18	1116	P
7916	Eight Mile	59S-37E-13	N-9	8/6	12	L
7917	Gumbo Limbo Hammock, Shark Valley	54S-36E-32	R-2	8/10	289	P
7918	Little Fox	60S-33E-16	N-6	8/14	1392	L
7919	Blatt's Blaze	59S-37E-10	N-10	8/19	47	L
7920	Sisal Pond #1	58S-35E-24	N-7	8/20	5	L
7921	Sisal Pond #2	58S-36E-30	N-8	8/20	44	L
7922	Shark Valley West	55S-36E-19	N-11	8/23	5	L
7923	S.W. Cane Mill	57S-35E-10	N-12	8/29	60	L

1979 (cont)

Computer Number	Fire Name	Location (Township-Range-Section of fire origin)	Original Fire Report Number	Date	Acres	Cause
7924	Pot Hammock	55S-35E-36	N-13	8/10	1	L
7925	Block P	58S-37E-14	7925	10/21	6	P
7926	Block J	58S-37E-9	7926	10/27	11	P
7927	T Blocks	58S-37E-13	7927	10/28	32	P
7928	Block I - W½	58S-37E-7	7928	10/29	391	P
7929	NW Block D	58S-36E-3	7929	10/30	446	P
7930	Block J	58S-37E-9	7930	10/31	492	P
7931	Camp Everglades	58S-37E-18	7931	11/1	171	P
7932	Block Y	58S-37E-12	7932	11/5	18	P
7933	Block F	58S-36E-24	7933	11/29	823	P
7934	December 1 (Research)	58S-37E-10	7934	12/18	10	P
7935	Block C	58S-36E-15	7935	12/18	795	P

APPENDIX II

Summary of fire records for areas burned routinely by prescribed fire. The first number represents the year and fire number by year and is the fire number recorded in Appendix I. (Example 5701 is a fire number for the first fire that burned in 1957). The second number represents the month/date the fire occurred. Accompanying figures show locations of burn units.



LONG PINE KEY PINE BLOCKS

LONG PINE KEY PINE BLOCKS

A

5701W - 1/16
6601 - 1/17
7129 - 1/7
7514 - 3/3
7504 - 1/14

B

5802 - 4/21
6714 - 12/10
7239 - 12/7
7561 - 9/10
7701 - 1/12

C

6330 - 12/16
7123 - 9/10
7504 - 1/14
7935 - 12/18

D

6906W - 4/24
7369 - 12/14
7413 - 2/12
7504 - 1/14
7802 - 3/30

E

5902 - 1/18
6905 - 4/24
7504 - 1/14

F

5904 - 4/8
6904 - 4/23
7463W - 11/23
7503 - 1/8
7933 - 11/29

G

5904 - 4/8
6909 - 12/10
7211 - 3/1
7370 - 12/18
7575 - 12/11

H

6001 - 2/10
7237 - 11/16
7425W - 3/28
7622 - 11/26
7702 - 1/26

I

5712W - 8/11
6006 - 3/17
6306 - 2/6
6912W - 12/23
7425W - 3/28
7702 - 1/26
7928 - 10/29

J

6003 - 2/24
7136 - 11/18
7425W - 3/28
7818 - 12/18
7926 - 11/27
7930 - 10/31

Boy Scout Camp

7302 - 1/5
7516 - 3/6
7931 - 11/1

Pines West of Block A

7609 - 3/12

Pines North of Block D

7620 - 11/23
7903 - 1/16
7929 - 10/30

Pines West of Scout Camp

7574 - 12/3

Hayes Barn Pines

7606 - 2/21

Pines East of Mahogany Ham.

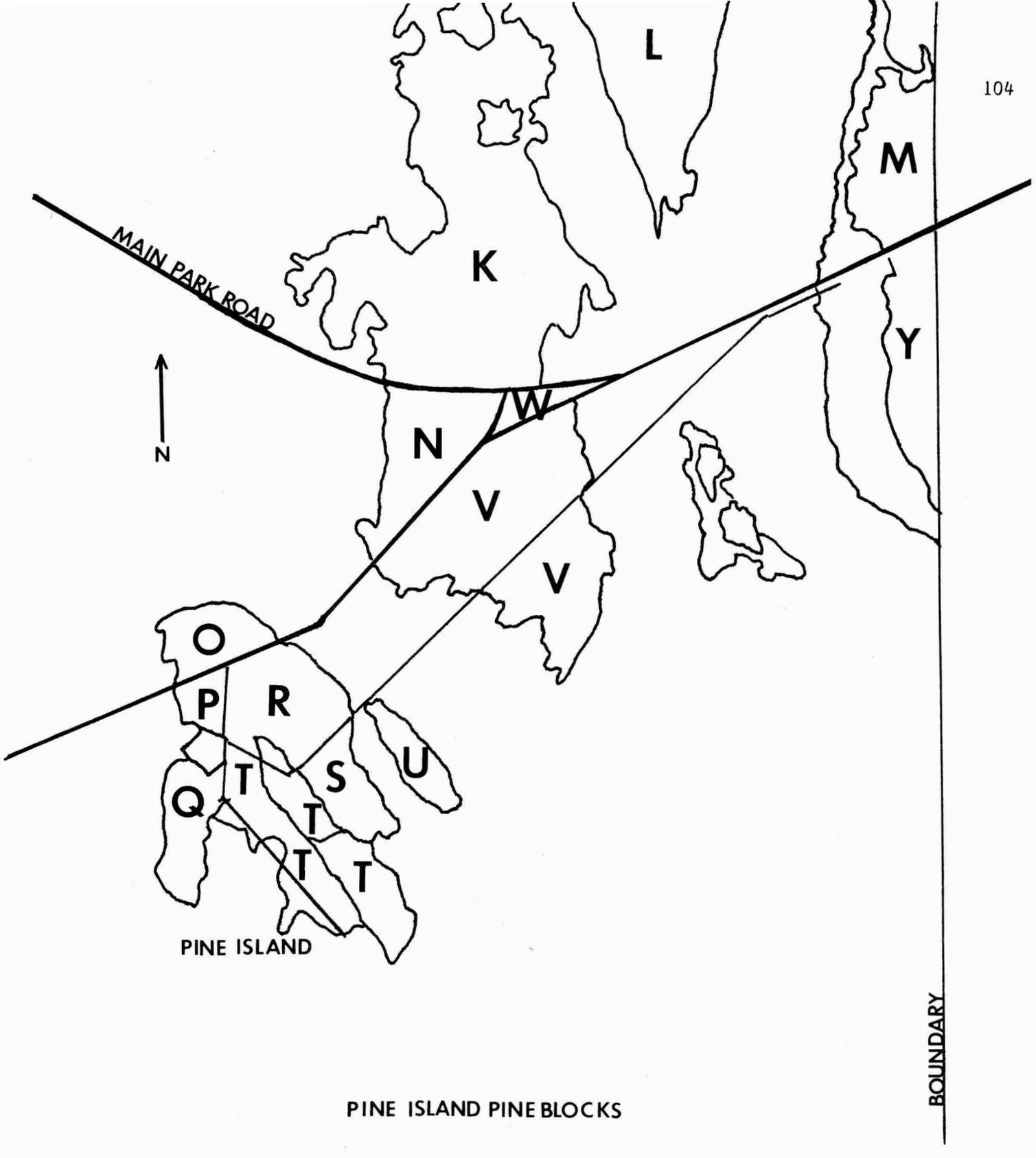
7511 - 2/11
7608 - 3/4

Long Pine Key Campground

6711 - 6/27
7133 - 11/5
7359 - 10/18
7456 - 11/7
7812 - 9/19

Pine Glades Lake

7207 - 2/20
7621 - 11/23



PINE ISLAND PINE BLOCKS

PINE ISLAND PINE BLOCKS

K
6908 - 12/4
7231 - 10/11
7242 - 12/20
7403 - 1/21
7624 - 12/9

L
6908 - 12/4
7403 - 1/21
7624 - 12/9

M
6908 - 12/4
7233 - 10/27
7410 - 2/5
7527 - 4/17
7556 - 7/18
7571 - 11/17
7624 - 12/9

N
6908 - 12/4
7216 - 3/20
7571 - 11/17
7816 - 12/12

O
6908 - 12/4
7216 - 3/20
7571 - 11/17
7816 - 12/12

P
6818 - 12/6
7238 - 12/1
7571 - 11/17

Q
7125 - 9/27
7367 - 11/27
7419 - 2/21
7625 - 12/9

R
6231 - 9/10
6821 - 12/8
7135 - 11/11
7557 - 7/23

S
6231 - 9/10
6821 - 12/18
7135 - 11/11
7226 - (S_1) 9/21
7240 - (S_2) 12/10
7571 - 11/17

T
6820 - 12/17
7205 - 2/14
7564 - 10/3
7927 - 10/28

T_1
6820 - 12/17
7205 - 2/14
7564 - 10/3
7927 - 10/28

T_{11}
6907 - 12/2
7229 - 10/9
7564 - 10/3
7927 - 10/28

T_{111}
7227 - 9/29
7564 - 10/3
7927 - 10/28

U
7004 - 7/28
7120 - 7/28
7623 - 12/8

V
6817 - 12/4
7121 - 8/18
7360 - 10/25
7368 - 11/30
7623 - 12/8

PINE ISLAND PINE BLOCKS (continued)

V$_1$

7007 - 11/12
7360 - 10/25
7623 - 12/8

W

6817 - 12/4
7360 - 10/25
7420 - 2/26
7623 - 12/8

X

7121 - 8/18
7623 - 12/8

Y

6910 - 12/12
7130 - 10/14
7230 - 10/10
7457 - 11/7
7901 - 1/4
7932 - 11/5

HOLE-IN-DONUT LANDS

Unit 1

7526 - 4/14
7541 - 6/10
7603 - 1/26
7703 - 2/2
7814 - 11/21

Unit 2

7138 - 11/24
7220 - 4/21
7310 - 1/30
7313 - 2/4
7314 - 2/6
7317 - 2/11
7318 - 2/13
7320 - 2/28
7326 - 3/15
7330 - 3/29
7332 - 4/5
7333 - 4/11
7361 - 10/30
7505 - 1/14
7528 - 4/23

Unit 3

7365 - 11/8
7437 - 5/24
7454 - 11/1
7455 1 11/1
7521 - 3/24
7532 - 4/30
7572 - 11/26
7574 - 12/3
7605 - 1/29

Unit 3 Con't

7612 - 5/14
7626 - 12/10
7704 - 2/6

Unit 4

7363 - 11/2
7435 - 5/1
7453 - 11/1
7524 - 3/28
7570 - 11/11
7610 - 4/3
7617 - 10/21
7618 - 11/2
7703 - 2/2
7706 - 2/25
7718 - 11/9

Unit 5

7513 - 3/1
7570 - 11/11
7534 - 4/18
7610 - 4/3
7703 - 2/2

Unit 6

7570 - 11/11
7617 - 10/21
7618 - 11/2

Unit 7

7502 - 1/7
7570 - 11/11
7618 - 11/2

Unit 8

7502 - 1/7
7570 - 11/11
7604 - 1/27
7617 - 10/21
7618 - 11/2
7908 - 4/18

Unit 9

7612 - 5/14

Unit 10

7572 - 11/26

BOUNDARY BURNS

North Boundary

7316 - 2/9
7607 - 2/23
7904 - 2/6
7906 - 3/15

West Boundary

7104 - 2/?
7303 - 1/10
7304 - 1/16
7306 - 1/19
7307 - 1/23
7308 - 1/27
7309 - 1/30
7321 - 3/2
7327 - 3/18
7422 - 3/12
7520 - 3/20

East Boundary

7134 - 11/8
7140 - 12/7
7202 - 1/21
7204 - 2/11
7236 - 11/3
7401 - 11/20
7411 - 2/5
7461 - 11/20
7510 - 2/11
7518 - 3/6
7568 - 11/10
7573 - 12/1
7719 - 12/22
7815 - 12/7

OTHER AREAS

Australian Pine

7221 - 5/13
7222 - 5/9
7223 - 5/17
7224 - 5/18
7312 - 1/31
7322 - 3/4
7325 - 3/14
7339 - 5/7
7343 - 5/29
7357 - 10/10

Royal Palm

7124 - 9/24
7329 - 3/19
7406 - 1/29
7459 - 11/19
7460 - 11/19

Sawgrass Strands

7301 - SG #5 1/3
7305 - SG #6 1/18
7315 - SG #7 2/7
7336 - SG #9b 4/25
7358 - SG #10 10/11
7365 - SG #11 11/21
7366 - SG #11 11/21
7371 - SG #12 12/19
7407 - SG #13 1/30
7408 - SG #13 1/30
7416 - SG #14 2/20
7417 - SG #14 2/20
7424 - SG #15 3/25
7451 - SG #1 10/3
7452 - SG #1 10/3
7508 - SG #2 & 16 2/5
7509 - SG #3 2/5
7530 - SG #9b 4/25
7567 - SG #10 10/11
7601 - SG #40 1/?
7917 - SG #13 8/10

APPENDIX III

Fire History of the Everglades National Park Area, pp. 9-19

from

Robertson, William B. 1953. A survey of the effects of fire in Everglades National Park. United States Department of the Interior, National Park Service. 169 pp. Used by permission of the author.

I. FIRE HISTORY OF THE EVERGLADES NATIONAL PARK AREA

A. Introduction

South Florida is perhaps unique in that it has had more fires and kept less account of them than any other section of the country. This questionable distinction of the area placed many a roadblock in the path of the investigator who, arriving on the scene at this late date, attempts an inquiry into the effects of fire. One reason for this casual attitude has been the very frequency of fire. The belief is widespread that wildfire is an intimate and perhaps a necessary part of the natural order in south Florida rather than an exceptional or catastrophic event. Over and over one hears such statements as, "This country always has burned and always will. Anyway fires don't hurt anything here."

In truth there is much to justify this view. Within a few weeks after fire the glades are green with sawgrass shoots, and the pinelands full of flowering herbs and new grasses. Even the scars of burned-out hammocks are soon hidden by rank growth of fireweed shrubs and vines. To a not overly careful observer it must seem inconceivable in many cases that the fire can have done any significant damage.

These local conditions - frequent and widespread fire, fire which often had little obvious effect, and a vast wilderness area where fires might burn undiscovered for days without threat to any works of man - have long retarded any serious consideration of fire effects. The succession of severe fire years within the last decade finally brought the problem to general attention. The realization has grown that, whatever its previous ecological role, wildfire has gained a new and menacing importance under the radically altered conditions of present day south Florida.

In consideration of fire effects it is important to reconstruct the history of fire occurrence in the area as fully as possible. This section of the report is an attempt at such a reconstruction considering the fire history of the region in four periods:

The pre-aboriginal period.

The period of aboriginal occupation of south Florida.

The period of intensive occupation of white man beginning around 1900.

The period 1948-52, for which detailed records of fire occurrence are available.

Obviously any comments on the first period are entirely conjectural, based on backward projection of certain present day characteristics of the area. Comments on the second period are also largely educated guesses, plus fragmentary early records. I believe that these mental exercises are justifiable, however, because of the theoretical importance of determining about how long fire has been a major ecological factor in south Florida. For the third period considerable information has been collected including weather data, accounts from the scientific literature, newspaper reports, and personal reminiscenses of residents with much field experience in the area. This material, however, is extremely scattered and scanty when applied to the picture of fire occurrence throughout the area for this period.

B. Fire in the Pre-aboriginal Period

It is of some importance to an understanding of the area to attempt to determine whether or not wildfire was a major ecological factor in South Florida under original conditions prior to any human occupancy of the region. Although a definite answer is not within reach here, consideration of geological and paleobotanical evidence as well as characteristics of the present vegetation permit certain reasonable inferences to be drawn.

1. The Geological Background - Detailed studies of the geology of south Florida have been presented by Parker and Hoy (1943), Parker and Cooke (1944), and Cooke (1945). These accounts show that throughout the Pleistocene Ice Age the Florida peninsula was alternately flooded by shallow seas and exposed beyond its present shores, as sea level rose and fell in response to glacial controls. Sea levels were below present sea level during each of the five major ice advances of the Pleistocene. During each of the four warmer interglacial periods melting back of the continental glaciers increased the volume of water in the oceans and submerged much of the Florida peninsula. High stands of the sea are well marked by marine terraces and old shore lines in the southeastern coastal plain at elevations from 270 to 25 feet above sea level. During the high stand of the sea of the interglacial period between the third and fourth Pleistocene glaciations the limestones, which occur at or near the surface in south Florida, were deposited. The corresponding low stands of the sea during the five glacial periods are more difficult to investigate, and little agreement exists as to their distance below present sea level. It is probable, however, that sea levels at these times were sufficiently low to empty Florida Bay and establish broad land connection between the Florida Keys and the mainland; and it is extremely unlikely that they were low enough to establish any sort of land connection between south Florida and Cuba or the Bahamas. The lower end of the peninsula south of Lake Okeechobee was inundated by the Pamlico Sea of the fourth interglacial period (Cooke, 1945;), and last elevated at the onset of the second Wisconsin glaciation (the last glacial advance), about 50,000 years ago according to the usual time scale given for the Pleistocene (Schuchert and Dunbar, 1941: 160). This sets an absolute time limit for formation of the present soil mantle and for invasion of the area by its present plant and animal life. The most recent geological event has been a rise in sea level in the post-glacial period with a consequent reduction of south Florida's land area, and re-isolation of the Florida Keys.

2. The Paleobotanical Background - Studies of fossil plants give us no reason to suspect that the group of plant species which occupied south Florida after its last Pleistocene submergence varied much in composition from that found today. Many of the tropical forms which characterize south Florida's present flora have a long fossil history in the southeastern United States. For example Berry's (1930: 41-47) lists show 31 genera of the Lower Eocene Wilcox Flora, largely from excavations in western Tennessee and Kentucky, which now occur in the United States only in south Florida. In all 32% of the genera of woody plants in the present south Florida flora are known from this fossil flora of 60 million years ago. Braun (1950: 451-455) gives a general summary of the fossil record of plants for late Mesozoic and Tertiary time. The record indicates an early period of warmer climates during which tropical and sub-tropical plants occurred far north of their present limits. Beginning in Miocene time there was a gradual cooling of climates and a southward shift of vegetation zones. The fossil flora from the late Pliocene

Citronelle formation of the Gulf Coast in west Florida closely resembles that found in the same area today (Berry, 1916). This indicates that by this time (about one million years ago) tropical forms in the flora of the southeastern United States must have been confined to peninsular Florida.

As has been mentioned, the Florida peninsula suffered extreme changes in area during the Pleistocene. In general, however, the periods of greatest land emergence from the sea were times of cooler climates and the periods of submergence times of warmer climates, so that it seems probable that the tropical flora was able to maintain a continuous foothold on the peninsula, moving north or south as compelled by changes in the climate and area of its range. The latest elevation of south Florida marks only one more stage in its migrations before changing climates and landforms. Through the ages there has doubtless been continual change in the specific composition of this isolated flora with loss of species by extinction and arrival of new species from the West Indies. It seems unlikely, however, that any significant change has occurred in the relatively short interval of post-glacial time.

3. The Present Vegetation - We may now ask a question more directly pertinent to the fire history of the area. If the plant species present have evidently undergone little recent change, what of the vegetation types they form?

The ecological picture of present day south Florida shows a bewildering mosaic of vegetation types some of which seem to be successionally related. As will be discussed later, tropical hardwood forest rapidly occupies pine forest areas; and bay and, in some cases, mangrove swamp forests tend to invade sawgrass prairie areas. It seems obvious that the status quo could not be long maintained unless some ecological factor operated to periodically return large areas to a sub-climax condition. At the present time fire is such a factor. It thus becomes of interest to examine the available evidence to see what it may indicate concerning the occurrence of natural fires in times before any human occupancy of south Florida.

4. Lightning Fires - Up until two years ago or less the answer to the question "does natural fire occur in south Florida?" would have been "No." There was a strong belief that lightning fires did not occur, and in the absence of any direct evidence to the contrary this was generally accepted. One feature of the newspaper coverage of fire in south Florida has been the search for other explanations for fires occurring in remote sections of the glades, which has produced some notable flights of fancy. This assumption that natural lightning fires were too infrequent to be of consequence has hindered understanding of the role of fire in south Florida, as well as planning for fire control. For example, several authors (Small, 1924, 1930; Beard, 1938; Egler, 1952) have considered the present vegetation, accepted the belief that natural fire was rare or absent, and concluded, quite logically with the assumption that a continuous broad-leaved forest must once have existed in south Florida. Egler's comment (op. cit.: 226) is typical. "In short, the vegetation of south Florida during late Pleistocene pre-Indian times may have been a dense evergreen broad-leaved tropical jungle . . ."

With the establishment (in 1951) of two fire lookout stations overlooking large sawgrass areas in Everglades National Park it soon became evident that natural fires caused by lightning do occur frequently. Several fires were seen to start from

observed lightning strikes in sawgrass and in tree islands of the Everglades. In all, lightning was the reported cause of 12 fires in 1951 and of 11 in 1952 (up to July 1).* Some of these fires were extinguished by rain which accompanied the electrical storm, but among them are also some of the major fires in the history of Everglades National Park. Too few data are at hand to permit much to be said about the seasonal occurrence of Everglades lightning fires. But the "dry storms" which set them appear at present to be a phenomenon of the very end of the dry season. Of 23 lightning fires reported to date three occurred in late May, 16 in June, and four in August.

With the establishment of the present importance of lightning-caused fires it becomes reasonable to assume that they have been a continuing factor throughout the geological existence of south Florida, and that the fire-maintained cover types have been a continuing feature of the south Florida vegetation.

(A word of caution may be needed here. With proof that lightning fires do occur comes the natural tendency to attribute all unexplained fires to lightning. Such overemphasis will serve the problem of understanding fire in the area as poorly as the earlier reluctance to consider the possibility of lightning fires.)

5. Endemic Plants - One of the characteristics which makes the flora of south Florida so interesting is the group of plant species which have originated in the region. Small's Manual of the Southeastern Flora (1933) shows 103 such species that have evolved in south Florida.** These are distributed in 31 plant families and 66 genera and include plants from both tropical and south temperate zones. Almost all of them are herbaceous plants or low shrubs. Examination of the habitats of these species gives us important additional evidence of long ages of natural fire in south Florida. Table 1 shows the distribution of these species according to the vegetation types in which they occur. Notice that well over half are limited to pine forest areas, and in all 70% of the species occur in vegetation types that today are maintained by fire.

Differentiation of new species requires geographic isolation of populations under new ecological conditions to which they become adjusted through a long period of natural selection. The evolution of low-growing plants of the kind which make up this unique south Floridian group certainly required that their sub-climax habitats remain constant for a long period, and this in turn required recurring natural fire. (Or other natural disturbance, of course, but fire seems the only likely factor). For example, at the present time almost all of the endemic pinewoods species are shaded out by invading hardwoods in pine forest areas that are free of fire for as little as five years. It is quite clear that they could not have evolved if natural fire has been absent, or even if irregular and infrequent occurrence in the region. Their existence as distinct species is inescapable proof of ages of regularly recurring natural fire sufficient to maintain large areas of sub-climax vegetation. It can thus be said with some assurance that the aspect of the vegetation of south Florida probably never differed much from that pictured in the earliest historical accounts.

*Note: These numbers also include fires in the Everglades Protection Zone.

**The list now includes 40 species (Loope and Avery, 1980). Many species have been found in the Bahamas and other island areas.

TABLE I: Ecological Distribution of Endemic Plant Species of South Florida

Vegetation Type	No. of Endemic Plant Species
Pineland	58
Hammock	22
Everglades Marshes	14
Other (Strand, Mangrove, Etc.)	9

C. Indian Fires.

The arrival of aboriginal populations in south Florida has not been accurately dated. Discovery of human remains in deposits at Vero Beach, which are referred to the Pamlico Inter-glacial stage (Cooke, 1945: 305-7), may indicate that aborigines occupied the lower peninsula almost as soon as the receding waters of the last interglacial sea made the area available. It is probable, however, that with the establishment of aboriginal populations, the picture of fire occurrence in south Florida was considerably modified. The following passage from the Journal of a 16th century outh Florida tourist, Alvar Nunez Cabeza de Vaca, is quoted by Small (1929:8)

> "Those from further inland have another remedy . . . which is to go about with a firebrand setting fire to the plains and timber so as to drive off the mosquitos, and also to get lizards and similar things which they eat to come out of the soil. In the same manner they kill deer encircling them with fires, and they do it also to deprive the animals of pasture, compelling them to go for food where the Indians want."

Egler (1952: 226-7) devotes considerable attention to an analysis of the probable effect exerted on south Florida vegetation by aboriginal use of fire. He makes two main points:

1. The sum effect of Indian fires was to modify the continuous "Pro-Indian Swamp Forests" creating a mosaic of vegetation types similar to that seen today (i.e. pineland with scattered hardwood hammocks, sawgrass prairie with scattered tree islands).

2. Indian fires were likely most frequent early in the dry season, occurring at a time when organic soils and hardwood hammock vegetation were still too wet to burn, and hence caused less destruction than fires later in the dry season.

In the previous section compelling evidence has been presented to show that natural fires must have been sufficiently frequent in south Florida from the earliest times to maintain large areas of sub-climas vegetation. I do not, therefore, see the need to invoke Indian fires as a major factor in the origin of these fire-maintained types. I agree, however, with Egler's assumptions that Indians were probably free and careless in using fire; that Indian fires were probably frequent; and that they probably tended to occur as early in the dry season as sawgrass would burn.

Concluding, there is reason to believe that fire incidence in south Florida increased sharply as early Indians became established with the addition of their fire-hunting and escaped fires to the recurring natural fires.

D. White Man Fires

One of the statements in Egler's (ibid.) analysis of the history of fire in south Florida with which I cannot agree is the following: "The chief difference between Indian fires and White Man fires: Indians burned with no conscience, as soon as things would burn. White Man with a conscience only delays burning . . ." Though perhaps true for many areas this view does not hold for the behavior of the white man in south Florida. In the Everglades area white man's incendiary activities have beggared those of his dusky brothers. I believe that the frequency of man-caused fires probably increased sharply as white replaced aborigines in the area. White man in south Florida burned freely for every reason that the Indian did, and for some all his own. Even today with the present finally awakened fire-consciousness one does not go long in south Florida before hearing of fires set to kill mosquitoes, kill rattlesnakes, clear out the brush, drive out game, create fresh pasture for cattle or deer, etc. Burning to locate gator holes in sawgrass areas was a common practice of commercial hide hunters. In a copy of an interview on file at Everglades National Park Headquarters, Mr. Loren Roberts describes the burning of the Ingraham Prairie behind Cape Sable by gator hunters about 1902. Add to these frankly incendiary fires those which spread more or less accidentally from farming and lumbering operations on the eastern rim of the glades, and an imposing picture of fire occurrence for the white man's half-century in south Florida is obtained.

Prior to the establishment of Everglades National Park little or no attempt was made to control fires on wild lands. Fire protection activities of local and state agencies were confined for the most part to guarding developed lands against wildfire. Their universal protective maneuver was (and is) backfiring, and it is at least to be suspected that in some instances the backfires themselves have spread widely to adjacent wild lands. In south Florida white man certainly did not, "With smug righteousness . . . forbid all fires" (loc.cit.).

As white occupation became established, the drainage of the glades began, and with lowering water levels the increasingly frequent fires did increasingly severe damage. Everglades water levels were lowered both by local direct drainage, and by the diking of Lake Okeechobee (complete in 1935) which cut off the slop-over that had formerly drained off to the south and may have provided an important source of water for the glades. The drainage of the Everglades has been discussed in detail by others (see Dovell, 1942: 132-161, also Willis, 1942; Bestor, 1942; and Herr, 1943), and will not be taken up here, except for the following summarizing statement:

> "The arterial canal system of the Everglades was begun about 1905. The beginning of the construction was along the coast working toward Okeechobee. Connection with Lake Okeechobee was made between 1916 and 1920 for the various canals. I believe that you could say that drainage was partially effective after about 1918." (Johnson, in. litt.)

Since drainage began to be effective, a pattern of increasingly severe fire has developed. Under present conditions the lower glades may be completely dry for months in dry years, much extending the period of critical fire danger. Previously a sort of balance had existed, with the generally higher water levels acting to restrict both the extent and severity of fires. Dry years with severe fires and much destruction of organic soils and hammock vegetation undoubtedly occurred, but it can be safely assumed that these were rare. Fires under the altered conditions brought about by drainage have been notable in two respects:

1. Destruction of organic soils, which in turn has decreased the water-holding capacity of the glades due to the loss of the peat and marl seal over the highly permeable underlying limestone.

2. Widespread destruction of hardwood forest vegetation, both upland hammocks and tree islands.

A chronological summary of fire occurrence in south Florida for the period 1900-1948 (see Table 14 of the preceeding text), and a table of rainfall records for the period 1900-1952 at 14 weather stations in the Lake Okeechobee-Everglades region are included in the Appendix. (Note: Rainfall data were not included in this paper). A brief discussion of the rainfall records follows:

Rainfall data are broken down into 12-month periods extending from May 1 to May 1. The annual figures are thus arranged in what may be called "biological years" rather than in calendar years, years extending approximately from the beginning of one rainy season to the beginning of the next. This appears to me to give a much clearer picture of the relation of rainfall to fire danger in south Florida than does the usual presentation. The severity of fire danger in any late winter-spring dry season is largely dependent on the rainfall of the immediately preceeding summer-fall rainy season. In instances where extremely wet years have followed extremely dry years, as has often been the case in southern Florida, some confusion has arisen regarding the true date of the bad fire year in the period. In addition, rainfall data presented in the usual manner often obscure the real severity of a drought period by lumping it with the succeeding rainy season, rather than the preceding one. A good illustration of both these effects is provided by rainfall data for the years 1930 through 1932. This span included two rainy seasons of well above normal rainfall (1930 & 1932), and one which was greatly deficient (1931). Various south Florida stations reported the following (inches):

	1930	1931	1932
Canal Point	63.29	39.87	67.91
Belle Glade	63.07	42.57	65.09
Miami	73.51	60.87	79.90
Coconut Grove	69.96	50.61	64.75
Pennsuco	76.50	65.35	83.92

On the basis of these figures by calendar years 1931 is indicated as a dry year at some stations and normal or slightly above at others. It does not look like a year of extreme fire hazard from these data. Compare, then, the picture when rainfall is shown for the years May 1, 1930 to May 1, 1931 and May 1, 1931 to May 1, 1932 (inches).

	1930-31	1931-32
Canal Point	57.09	33.11
Belle Glade	58.22	37.70
Miami	77.07	48.42
Coconut Grove	75.34	38.62
Pennsuco	78.14	53.42

It is seen that there was a 12-month period of extreme drought in this span of years (the second most severe on record for the region) not noticeable in the former figures because it occurred between two unusually wet periods. The effect of presenting rainfall data for south Florida by calendar years is to smooth and minimize the rainfall extremes, and to some degree observe the relation between fire hazard and rainfall. Notice also that the dry period extended into 1932, and it is probable that fire hazard was most severe in the spring of 1932 at the end of the prolonged drought. Examination of rainfall records presented by calendar years gives no hint of this. 1932 is shown as a year of above normal rainfall throughout the region, yet the spring of 1932 was marked by severe and general fire.

Close comparison of the rainfall records, and the narrative fire history will reveal some apparent inconsistencies most of which I am unable to resolve. So many of the fires in the area are man-caused, that an absolute relation between rainfall and fire occurrence need not be expected. Much of the area will burn at almost any time except during a rain or when covered by standing water (and to a limited extent even then). However, there is certainly a general positive relation between periods of low rainfall and increased frequency and severity of fire occurrence. For this reason one cannot help suspecting that in some cases sources quoted in the fire history may be in error. It seems odd for example that the 1927-28 period with the lowest recorded rainfall for the region should have passed without notice, while 1929 is cited as a bad fire year.

Taking into account the great variation in rainfall from year to year, and the amount of local variation in a given year for closely located stations (e.g. Mian and Coconut Grove recorded 72.23 and 50.98 respectively in 1933-34) it seems unsafe to attempt to generalize from the relatively short records at hand. A few points may, however, be noted. The included table lists the ten periods of lowest recorded rainfall and shows some of their characteristics.

Table 2. May 1 to May 1 Periods of Lowest Average Rainfall

Period	No. of Stations of Record	Recorded Rainfall	Comments
1927-28	10	40.85	Low throughout region.
1931-32	13	41.37	Near average at Dania, Ft. Lauderdale and Hypoluxo.
1938-39	12	42.41	Low throughout region.
1944-45	13	42.96	4" above average at Dania.
1921-22	7	43.25	Near average at Dania and Ft. Lauderdale
1942-43	14	45.78	Low throughout region.
1943-44	13	46.54	Low throughtout region.
1950-51	11	47.13	Above average at Tamiami Trail, 40 Mile Bend. Near average at Kissimmee.
1951-52	11	47.61	Above average at Kissimmee, Okeechobee, Moore Haven and Belle Glade.
1913-14	6	48.70	Near average at Homestead

Rainfall records strongly indicate that water levels on the lower glades now depend entirely upon the local rainfall south of the Tamiami Trail. In the 1951-52 period above average rainfall at Kissimmee, Okeechobee, and around the south rim of Lake Okeechobee did not relieve drought conditions in the Everglades National Park area where fire hazard remained extreme through most of the winter and spring. Similarly, as may be seen from the above table, several periods of low rainfall and extensive fires, have occurred at times when east coast stations in Broward and Palm Beach counties reported average or above-average rainfall. It seems evident that the former Kissimmee River-Lake Okeechobee-Everglades system is no longer an effective drainage unit. Canal and road barriers, and the diking of the lake have created several smaller drainages each largely dependent on its local rainfall. The importance of exact local data in rating rainfall effects upon fire hazard in Everglades National Park is thus emphasized.

A final point to be noted is the importance of rainfall distribution as well as total rainy season rainfall. Severe fires have occurred in years of above-average total

May 1 to May 1 rainfall (as in 1949-50), when rainfall is highly concentrated in the summer and early fall with little thereafter. In 1949-50, although the total rainfall was slightly over average, very little fell after October 1 and the following April and May were marked by bad fires.

E. Fire Since The Establishment of Everglades National Park

During the five year period all fires (with the exception of a few either completely inaccessible or discovered after fire was out) were actively fought by National Park Service personnel until controlled. In the face of this all-out effort the total acreage burned, 205,641 acres, is far from encouraging. Two facts must be kept in mind, however:

1. The period included 1951 and 1952 (to July 1), both of which were abnormally dry years, at least by all previous standards.

2. The group "started from scratch," both as regards ideas and equipment for direct suppression of pine rockland and sawgrass fires; and was forced to evolve suppression techniques, and invent (or at least inventively select) equipment, as it went along.

TABLE 3. Summary of Fire Occurrence in Everglades National Park 1948-52. (Note: Included are fires inside Everglades National Park and Fire Protection Zone).

Year	Number of Reportable Fires	Acreage Burned	Fire Suppression Costs
1948	11	1,965	195.54
1949	32	18,431	1,566.12
1950	23	121,370	25,261.61
1951	27	57,771	21,230.93
1952 (to July 1)	15	6,104	2,276.38

Fires of this period extensively damaged hammocks of the western half of Long Pine Key. Over much of this area all hammocks are either badly gutted or severely burned around the edges. Many tree islands of the Everglades have suffered likewise, particularly as a result of the Ironpot Hammock and Shark Valley fires of June 1951. Considerable destruction of organic soil has occurred in tree islands of the Everglades, and some of the remaining muck deposits of sawgrass areas have also burned out.

In summation, the results of five years of fire fighting, that has absorbed much of the productive energy of the Everglades National Park staff, inspire no feeling more robust than a very reserved optimism. Much has been learned, and a high

degree of fire-fighting skill, both strategic and tactical, has been achieved. However, unless the problem of additional water supply can be solved, the best efforts of fire detection and suppression are likely to provide only local victories in a lost war. Obviously the maintenance of more water on the glades is the central problem in management of South Florida wild lands. It is probable that the glades cannot be long maintained in their present aspect, even in the absence of fire, unless this problem is satisfactorily solved. Clayton and Neller (1939:156) have reported that annual loss of water by evaporation and transpiration from experimental plots of sawgrass averaged 12 inches more than the total annual rainfall over a series of years. This indicates that the glades will continue to dry up unless some way is found to hold water in storage areas or to carry excess water from Lake Okeechobee to the south, instead of out to sea via canals. So long as each year of below average rainfall in the immediate Everglades National Park area results in a five-to-seven month period of extreme fire danger over much of the area, we can expect continued large and destructive glades fires in the park.

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