

## Chapter 15: Wildland Fire

When Everglades National Park was established in 1947, the long-standing NPS policy was to suppress all wildfires in parks, whether caused by lightning or human activity. The NPS was not alone in this; at the time, fire suppression was standard policy for all federal government land managers. NPS fire policies had been developed in the forests of the western states and for the most part echoed the policies of the U.S. Forest Service. The geology and vegetation of South Florida, as well as the region's cultural attitudes and practices regarding fire, differed sharply from the western experience. Additionally, combating fires with traditional techniques exposed Everglades fire fighters to considerable hardship and danger, because of the region's solution holes, exposed limestone rock, sawgrass, palmetto, muck, and insects. All of these factors produced a relationship with fire at Everglades National Park that was unique within the Service. The park played a key role in the evolution of national wildland fire policies. Research done in the Everglades by park biologist Dr. Bill Robertson Jr. in the 1950s added much to the general understanding of the role of fire in ecosystems and led to the park's program of prescribed burning, the first such program in the NPS. The Everglades fire experience then helped to shape what historian Stephen J. Pyne has called fire's "cultural revolution" in the 1960s and thereafter. In this revolution, the idea that fires should be prevented whenever possible and always fought when they broke out gave way to an understanding that: 1) fire was a part of the natural order, 2) some fires should be allowed to burn, and 3) prescribed burns were often beneficial. In the 2000s, a growing belief that "natural" Everglades landscapes might well have been fire-maintained by humans for millennia began to influence fire policies.<sup>748</sup>

### Early Park Approaches to Fire

In the late 1940s, NPS managers clearly understood that South Florida residents, Indian and white, had been using fire to manage landscapes since at least the nineteenth century. Only in later decades did scientists begin to understand that the routine use of fire by indigenous people around the world for a variety of purposes went back thousands of years. NPS managers were quite aware of the damage done by human-caused fire to South Florida residential areas on the edges of the Everglades. They doubted, however, that lightning was a major cause of Everglades fires. This view was expressed by an NPS forester who wrote: "All fires are probably man-caused

<sup>748</sup> Sellars, 126-127, 162-163, 253-257; Stephen J. Pyne, *America's Fires: A Historical Context for Policy and Practice* (Durham, N.C.: Forest History Society, 2010), 46-47. There are exceptions to this generalized picture. As early as the 1890s, geologist John Wesley Powell argued that Native American practices of burning understory helped prevent large crown fires. Pyne, 23.

since lightning is normally accompanied by heavy rain.” Superintendent Beard at first held this view and tended to be dismissive of local residents, including Ernest Coe, who argued that lightning caused fires. NPS managers understood that Indians in Florida had long used fire in hunting and to discourage mosquitoes and other pests. They also knew that subsequent white and black settlers used fire for these ends and also to clear fields for planting, renew rangeland vegetation for livestock, and clear underbrush before an area was logged. By the middle of the twentieth century, many wildfires each year were accidentally set by the careless handling of cigarettes and cooking fires. Dry-season incendiary fires tended to be the most damaging to built-up areas and to Florida’s image as a winter vacation paradise.<sup>749</sup>

The drainage work completed by the state in South Florida in the first decades of the twentieth century made fire a much bigger problem. Drainage lowered the water tables in the Everglades, prolonging the dry season and exposing muck and peat for longer periods. This caused the exposed soil to oxidize, making it more vulnerable to erosion and fire. Fires that might have burned out quickly in pre-drainage days tended to burn longer and cause more damage after drainage. The Everglades is a mosaic of differing natural environments, and fire has different effects in these various environments. Prior to drainage, fire was likely more common in pine uplands and sawgrass stands than on tree islands. Lowered water tables changed the effects of fire, especially in sawgrass marshes and coastal prairies. Before 1900, areas of sawgrass often would burn in the wet season, when the soil was inundated or heavily saturated. Under these conditions, the sawgrass regenerated rapidly. Following drainage, fires in sawgrass more frequently burned below the surface, destroying the stalks (known as culms) that normally would have sent out new growth. Fires in the dry season also burned the accumulated organic material (muck and peat) that formed the soil in the Everglades. Once ignited, muck fires could burn for months. Bill Robertson noted that between 1920 and 1954, extensive fires occurred in the Everglades in more than one-third of the winters. Fires were particularly troublesome in 1938, 1939, and 1945. In April 1939, news accounts told of “great clouds of smoke rolling into Miami” as more than a million acres burned. Everglades fires that sent smoke and ash east to the resort areas on the Atlantic coast were especially worrisome to tourist-oriented South Florida.<sup>750</sup>

In the subtropical environment of the Everglades, the effects of fire or the absence of fire show up within a few years. Once they had gained some experience, Superintendent Beard and his staff concluded that what they had learned about fire

<sup>749</sup> Asst. Chief Forester L. F. Cook to RDR1, Apr. 26, 1948, NARA Ph, RG 79., 79-58A-360, box 7; Dale L. Taylor, *Fire History and Fire Records for Everglades National Park, 1948-1979* (Homestead, Fla.: SFRC, 1981), 114-116.

<sup>750</sup> McVoy, et al., 105-109, D86; “Tragedy in Florida,” *Dallas News*, Apr. 23, 1939; William B. Robertson Jr., “Everglades Fires – Past, Present and Future,” *Everglades Natural History* 2/1 (1954), 15.

elsewhere did not always apply in this new park. Following NPS policy and hoping to avoid a repeat of the catastrophic dry season fires of recent years, Everglades staff began with the idea that all fires should be suppressed. In 1948, the park entered into a cooperative agreement with Dade County, which established an Everglades Fire Protection Zone. The zone extended 12 miles east of the eastern border of the park. The NPS staff pledged to help fight fires in this zone when requested, and Dade County agreed to help with fires within the park. The following year, 1949, the park adopted its first fire control plan, which ran to 23 pages and had a drawing by Superintendent Beard on its cover. In 1950, park staff had to fight three large fires simultaneously: Tamiami Fire No. 3, Long Pine Key Fire No. 3, and the Mowry Fire. These fires were fought day and night, mostly on foot, with very limited equipment that was difficult to move through the dense vegetation. Airplanes were used only to scout fires and map their extent. In May 1950, Superintendent Beard met with his ranger and fire protection staff for a critique of the fire season; the fire critique became an annual event. The park also instituted annual fire training sessions, which the NPS regional forester often attended. In these early years, park staff worked heroically under extremely difficult conditions to fight fires. Beard wrote of this period of fire control, “every time we used to have a fire the chief clerk, superintendent, and fiscal accounting clerk grabbed their old pants . . . and ran out to work on it” (figure 15-1, Supt. Beard’s take on fire fighting). Given the huge effort required and the dangers to firefighters, Beard and others came to question the wisdom of suppressing every fire. They also noted that the tracks left by fire-fighting equipment like bulldozers and mobile pumper tanks often left scars that lasted far longer than any visible effects of the fire itself.<sup>751</sup>

Beard and his staff were also learning more about the role of fire in Everglades environments. In 1950/1951, two fire observation towers were erected, one on Long Pine Key near present-day Research Road and the other near the end of the Shark Valley Road (at that time, commonly known then as the Seven-Mile Road) running off Tamiami Trail.<sup>752</sup> Once the towers were manned, park staff made an interesting observation: they saw that lightning did indeed cause a number of fires. Most were quickly put out by rain or high humidity, but a few turned into large blazes. Park staff also began to understand that fire played a key role in maintaining the forest communities, dominated by stands of slash pine (*Pinus elliotti* var. *densa*), on uplands like Long Pine Key. Without periodic fires in the pine uplands, hardwood species came to dominate and soon shaded out the typical understory of a pine forest. Park staff began to

<sup>751</sup> Fire Control Plan, Everglades National Park, Feb. 1949, NARA II, RG 79, NPS CCF, box 924; Taylor, *Fire History*, 6, 17; Everglades National Park Fire Critique, May 16, 1950; Supt. Beard to RDR1, Dec. 8, 1955, NARA II, RG 79, NPS AF, box 1384; Supt. Beard to C. Ray Vinten, Jan. 15, 1953, EVER 22965.

<sup>752</sup> The Seven-Mile Road fire tower was removed in Sep. 1964, following the completion of the Shark Valley observation tower/fire lookout. SMR, Sep. 1964.

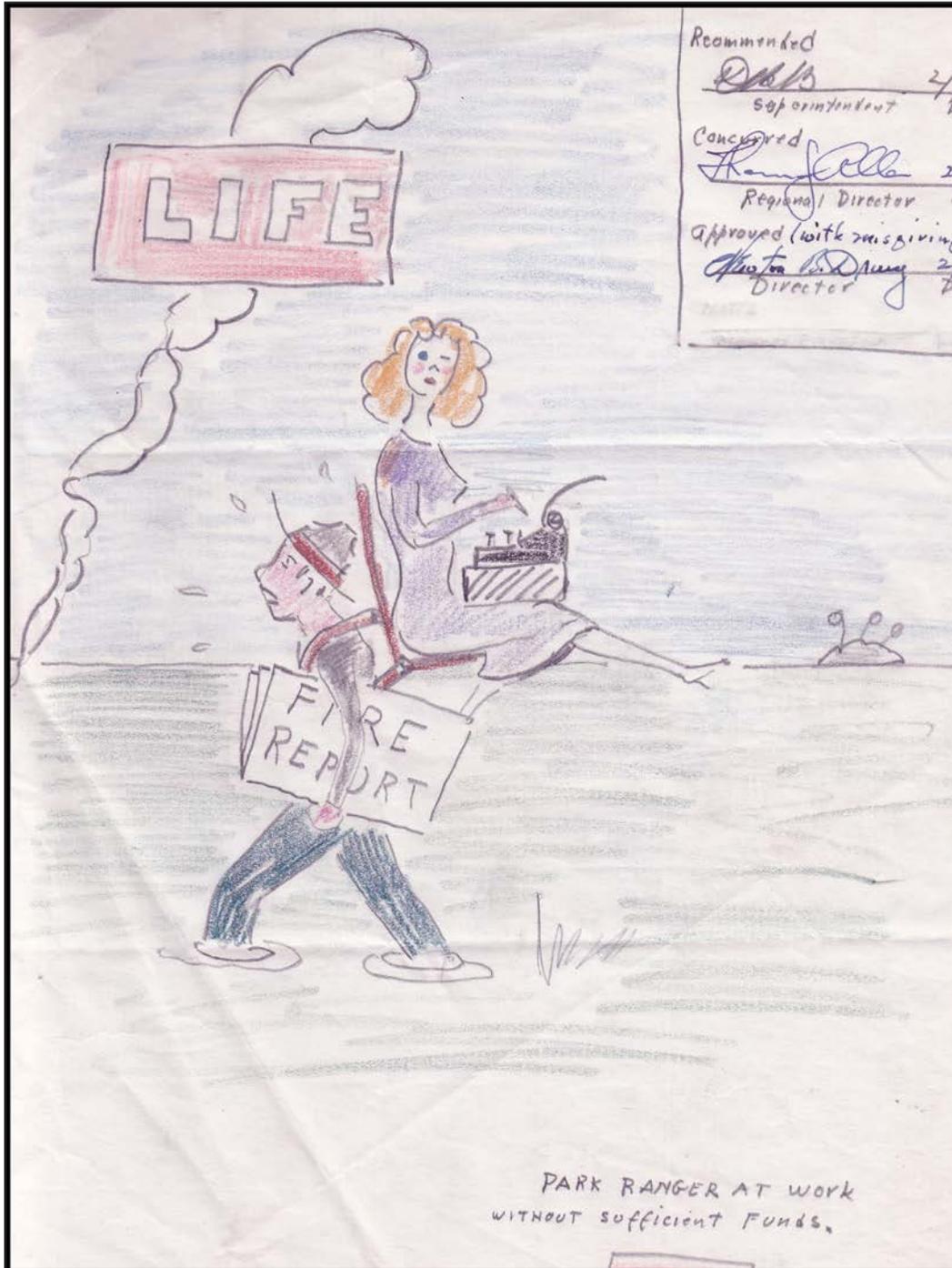


Figure 15-1. Superintendent Beard's take on fire fighting, 1949

consider that they might have to deliberately start fires to replicate what natural fire once had achieved. Nothing in the record indicates that park managers in this period considered the possibility that Native Americans deliberately burned pine upland areas to facilitate hunting or encourage the growth of useful plants like the coontie. As early as March 1949, Beard observed: "I do believe that, after about a decade of protection down here, we shall come to the conclusion that controlled burning in certain vegetative types will be in accordance with policy and good sense."<sup>753</sup>

Bill Robertson began to learn about the Everglades ecosystem in 1948 as he did field work for his PhD dissertation on the breeding bird populations of South Florida. In 1951-1952 he took a seasonal position as a fire control aide at Everglades National Park. Robertson investigated the role of fire and produced a 1953 study, "A Survey of the Effects of Fire in Everglades National Park." The key finding of this study was that Florida's rockland pine forests were a subclimax vegetational community. If these forests did not regularly burn, hardwood forest communities would replace them. Robertson wrote: "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."<sup>754</sup> The unavoidable conclusion was that the NPS would have to tolerate or introduce fire in pine uplands if this rare forest community, which was rapidly disappearing outside the park, was to survive.

The park's 1956 fire control plan reflected the first eight years of experience with Everglades fire. The basic policy was that "all fires inside or threatening the park shall be suppressed." The only exceptions were fires in the coastal mangrove zone and most fires in hardwood hammocks. Fires in the mangrove belt, usually touched off by lightning, typically burned out quickly and were difficult to detect and fight. Park policy was to let them burn unless they threatened to move into prairie or marsh areas.<sup>755</sup> Rather than fight fires on hammocks, park staff attempted to protect threatened hammocks by creating fire breaks around them so that wildfires would bypass them. The plan called for the two fire lookout towers to be manned from 9:30 am to 6:00 pm from November 1 through June 30. Pineland fires were to be combated using backfiring from roads or bulldozed firelines. Glades fires were to be addressed by spraying water at the head or hot flank, with swatters beating down embers. Bulldozers were not to be used on glades fires unless there was no other feasible means of fire control. The park maintained its cooperative agreement with Dade County, calling for mutual response to fires within the Everglades Fire Protection Zone. Additionally, the plan delineated

<sup>753</sup> Supt. Beard to RDR1, Mar. 29, 1949, NARA Ph, RG 79, 79-58A-360, box 7; Daniel B. Beard, "Let 'er Burn?," *Everglades Natural History* 2/1 (1954), 6-7.

<sup>754</sup> Beard, "Let 'er Burn?," 6-7; Robertson, "Everglades Fires," 13.

<sup>755</sup> Everglades superintendents seem never to have sought official sanction for this deviation from NPS policy; it was in the nature of a "house rule." Supt. Beard to RDR1, July 16, 1956, EFR.

the responsibilities of park staff for training, presuppression, equipment maintenance, and response.<sup>756</sup>

## The First Prescribed Fire

As of the middle 1950s, deliberate burning to maintain a vegetative community such as the Everglades pinelands was strictly against NPS policy. With an increased understanding of the role of fire in pine uplands, Superintendent Beard went to work to get permission for an exception for Everglades National Park. Relying on Bill Robertson's work, in July 1956, he wrote the regional director about the consequences of completely suppressing fire in the pine uplands. Late in the year he renewed his argument in a two-page memo to the regional director. Beard pointed out that:

the invasion of pine by hardwoods is more rapid than supposed . . . . It seems evident that the advance of hardwood succession will ultimately result in the extinction of south Florida slash pine and . . . in the loss to the park of many land birds and other animals found only in the pine forest habitat.

He closed this memo by asking for immediate consideration of an exception to NPS policy. Regional Director Elbert Cox and the regional forester supported Beard's request and passed it on to Director Conrad Wirth. Wirth consulted with the heads of major conservation groups, including the Nature Conservancy. A month later the NPS director approved this "radical departure from the long-established and effective fire control policy of the Service." He stipulated though that he personally would need to approve the burn plan and that burning should be limited to the smallest area of the park that would ensure the maintenance of "a representative sample of this pine type." The NPS was moving away from its longstanding policy in this instance, but very cautiously. Without Beard's persistence and NPS management's respect for his knowledge of local conditions, this deviation from long-standing policy likely would not have occurred.<sup>757</sup>

In June 1957, Bill Robertson prepared a management plan for this first prescribed burning program, which Director Wirth approved in October. Under the plan, pine upland areas (Long Pine Key, Pine Island, and Parachute Key) were divided into study blocks, denominated Blocks A through K. Blocks A through J were on Long Pine Key. Block K, which originally comprised all the other upland areas, later was subdivided

<sup>756</sup> Everglades National Park Fire Control Plan, May 1956, EFR.

<sup>757</sup> Supt. Beard to RDR1, Nov. 14, 1956, Dir. to RDR1, Dec. 18, 1956, NARA II, RG 79, NPS AF, box 1384; Taylor, *Fire History*, 15-16; George B. Fell, Exec. Dir., The Nature Conservancy, Nov. 19, 1957, EFR. Biologist and NPS collaborator Frank C. Craighead also supported the idea of prescribed burning in the pinelands. Frank C. Craighead to RDR1, no date [July 1956?], EVER 42242.

into Blocks K through Z. The plan called for doing burns from December through March. The timing was based more on the availability of winter seasonal employees than any effort to mimic the timing of natural fires. Summer (wet season) fires caused by lightning were to be allowed to burn in the uplands, but were to be monitored. During 1957, park staff blazed 20 miles of rough-graded fire roads on Long Pine Key to separate the study blocks. On April 21, 1958, park staff conducted a controlled burn of Block B, about 1,500 acres, on Long Pine Key (figure 15-2, Setting the park's first prescribed burn). This represented the first time the NPS had conducted a prescribed burn as part of a long-term plan that included monitoring of results.<sup>758</sup> The *Miami*



**Figure 15-2, Setting the park's first prescribed burn**

*News* explained that “a good fire is occasionally the best friend of the slash pine.” In subsequent years, all of the remaining study blocks were burned pursuant to a schedule. Robertson and ranger staff documented conditions in the study blocks before and after the burns from 1958 through 1965. After 1965, the burns continued but with less rigorous data collection.<sup>759</sup>

The new policy applied only to the park's pine uplands; suppression of other fires remained official Everglades National Park policy through 1972. In November 1965, the park burned all of Pine Island to reduce the large

amount of fuel produced by Hurricane Betsy. Between 1969 and 1972, the park began to extend its controlled burning program beyond pineland areas to all areas of the park that were fire-dependent, potentially embracing approximately 438,000 acres. Park staff burned 30 experimental plots in the Shark Slough and studied the results. Sawgrass stands that remain unburned for long periods become ecologically degraded and produce large fuel loads that contribute to making unplanned fires larger and more dangerous. Park staff concluded that controlled burns succeeded in reducing dead sawgrass fuel loads and promoting new growth. Over time, controlled burns also began to be used in an attempt to control or eliminate exotic vegetation. The burning

<sup>758</sup> Sequoia National Park Supt. John White did some limited controlled burning on his own authority in the 1920s, and Pipestone National Monument Supt. Lyle K. Lynch in 1950 did a controlled grasslands burn. Neither had approval from the Washington NPS office. Hal K. Rothman, *Blazing Heritage: A History of Wildfire in the National Parks* (New York: Oxford University Press, 2007), 42, 86-87.

<sup>759</sup> Supt. Allin to RDSE, Apr. 15, 1968, WRNC, NPS, 79-68-8, box 12; SMR, Apr. 1958; Taylor, *Fire History*, 14-16; “Park Rangers Set Helpful Fire, *Miami News*, Apr. 21, 1958.

of thick stands of Australian pine, where herbicides were ineffective, began in 1971. Still, pine uplands remained the overwhelming focus of the prescribed burning.<sup>760</sup>

One of the most serious fires in the park's history, the Shark Valley Fire, raged from May 15 to June 20, 1962. This incendiary fire began just south of the Tamiami Trail, nine miles east of the park but within the fire protection zone where the park and Dade County had mutual responsibilities. Park staff immediately joined Dade County firefighters in an effort to keep the fire out of the park. By the end of the second day, however, an arm of the fire had crossed the park boundary. On the fourth day, brisk winds spread the fire some 16 miles down Shark Valley, and the park requested outside assistance. Personnel from Homestead Air Force Base and the Navy were in the ranks of firefighters by the fifth day. Several days later, the Service also hired Seminoles as firefighters. The Coast Guard and later the Navy supplied a helicopter which proved extremely useful in transporting men and equipment. Ranger-Pilot Ralph Miele made many overflights to monitor the fire's progress. With these added resources, the park was able to keep the fire from reaching the main park road. On May 24 a second fire that had begun in the Big Cypress Swamp merged with the Shark Valley Fire. At this point, a B-26 tanker plane and Stearman cropduster planes were used to drop water on the fire, the first use of aerial water drops by Everglades National Park. The Shark Valley Fire was declared under control on June 5 and officially out on June 20. By that time, it had burned 77,664 acres within the park and 106,880 outside of it.<sup>761</sup>

Park managers gleaned several valuable lessons in combating the Shark Valley Fire and others in the 1960s. The use of helicopters proved significantly more effective than glades buggies in fighting a fast-moving fire over difficult terrain. Park staff agreed that "helicopters should be used whenever possible on all future fires other than the small ones." Managers judged the aerial dropping of water a partial success and looked to experiment with water bombing in the future, with the addition of fire retardants to the water. Radio communication among fire crews and between crews and pilots was often lost during the fire and recognized as an area that needed improvement. After a fire in 1969, park management decided to discontinue fighting fires at night for safety reasons. Managers were also increasingly reluctant to expose staff to the dangers of directly attacking glades fires, and the use of backfiring or spot ignition to deprive fires of fuel became more common.<sup>762</sup>

760 R. W. Klukas, "Control Burn Activities in Everglades National Park" (Tallahassee: 12<sup>th</sup> Tall Timbers Fire Ecology Conference Papers, 1973); Harold W. Warner, "The Effects of Fire on Sawgrass in Shark Slough," Mar. 1975, EFR; SMR, Nov. 1965; Thomas Richard Anderson, interview by author, Sep. 26, 2013.

761 Narrative – Shark Valley Fire, July 1962; Chief Park Ranger to Supt., July 20, 1962, EFR; Ralph Miele, interview by author, June 13, 2012.

762 Narrative – Shark Valley Fire, July 1962; Chief Park Ranger to Supt., July 20, 1962, EFR; Taylor, *Fire History*, 6.

## Fire Management Replaces Fire Control

In the early 1970s, the park contracted with Ronald H. Hofstetter of the University of Miami to undertake a study of fire and fire management in the park. Hofstetter's 1975 report, *Effects of Fire in the Ecosystem*, looked at the effects of fire on sawgrass glades and wet prairies as well as pine uplands. The report included a number of recommendations:

1. Establishing the areas within the park where fires would be allowed to burn and other areas where they would be suppressed.
2. Systematically tracking water levels, soil moisture, and fuel loads.
3. Burning pine areas on a 3- to 7-year schedule.
4. Burning glades areas on a 10-year schedule.
5. Using spot ignition for management burns, rather than line ignition, to mimic lightning ignition.
6. Conducting prescribed burns in the wet season or early in the dry season, when most natural fires occur.
7. Establishing a dedicated prescribed-burn team in the park.
8. Educating the public about fire ecology and prescribed burning.<sup>763</sup>

Attitudes nationwide toward fire prevention and fire suppression were changing in the 1960s and 1970s, as the environmental movement began to take hold in the U.S. The 1963 Leopold Report recommended that the NPS change its fire policies. The report specifically cited the Everglades experience with controlled burning as a positive example of more ecologically attuned resource management. It recommended that the Service make greater use of controlled fire, which it described as “the most ‘natural’ and much the cheapest and easiest” method of manipulating vegetation (see chapter 11 for details on the Leopold Report). The experience gained at Everglades National Park, fire research being conducted at Sequoia National Park, and the work of Florida's Tall Timbers Research Station all influenced the evolution of NPS attitudes.<sup>764</sup> Beginning in the 1960s, the Service began to revise its fire policies. The 1968 version of the agency's management policies for the first time recognized fire as a natural ecological factor. The policies announced that some naturally occurring fires could be allowed to burn and prescribed burns could take place. Naturally occurring fires that were allowed to burn became known as prescribed natural burns. Fires set by

<sup>763</sup> Ronald H. Hofstetter, *Effects of Fire in the Ecosystem: An Ecological Study of the Effects of Fire on the Wet Prairie, Sawgrass Glades, and Pineland Communities of South Florida, Final Report*, EVER-N-48, USDI National Park Service, NTIS No. PB 231940, June 1975.

<sup>764</sup> Established in Tallahassee in 1958, the Tall Timbers Research Station began a series of fire ecology conferences in 1962 that fostered the exchange of ideas and best practices among biologists and resource managers. Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Seattle: University of Washington Press, 1997), 159.

staff were known as prescribed management burns. Fires not meeting park management's goals would continue to be suppressed. This new policy gave the NPS a leading position on fire management and allowed superintendents considerably more scope to craft fire policy in line with local conditions. Everglades National Park's fire *control* plan became a fire *management* plan in 1973, reflecting this change in attitude.<sup>765</sup>

The 1973 Everglades National Park Fire Management Plan reflected the cultural revolution in dealing with fire. The document stated:

The objective of the [fire management] program is to manage fire as one of the environmental factors, along with water, so as to let natural processes perpetuate the natural ecosystems of Everglades National Park by allowing lightning and man-caused fires to burn under a prescription in designated fire management units and by prescribed burning.

Each fire not deliberately set by the park would be evaluated, with one of three responses—suppression, containment, or observation—chosen based on the conditions that prevailed. Three fire management units (FMUs) were established within the park: mangrove/coastal glade (328,000 acres), Everglades prairie (356,811 acres), and pineland (13,000 acres). The boundaries of the FMUs were established based on management objectives, different response objectives, and defensible borders. The zones, subject to minor boundary changes, remain in effect at this writing. The most significant change has been in the boundary of FMU 3, which formerly had an irregular boundary, but has now been simplified to embrace the territory between the main park road and the route of Ingraham Highway. The 1973 plan also recognized the Everglades Protection Zone, corresponding to the 12-mile mutual protection zone established in earlier agreements with Dade County. The Everglades Protection Zone became the responsibility of the Florida Division of Forestry in 1975. Following the East Everglades expansion of the park authorized in 1989 legislation, the approximately 109,000 acres added to the park became a new FMU, FMU 4.<sup>766</sup>

As articulated in the 1973 plan, the fire management strategy for each of the three FMUs was essentially to allow fires to burn. For the coastal zone, no action was anticipated when fire broke out. In the prairie zone, lightning fires would be monitored, and man-caused fires would be fought only if soil moisture conditions were unfavorable and only with indirect methods (i.e., backfiring). In the pineland zones, fires would be allowed to burn to the limits of the controlled-burn block where they

<sup>765</sup> A. Starker Leopold, *Wildlife Management in the National Parks* (Washington, D.C.: NPS, March 1963), [www.cr.nps.gov/history/online\\_books/leopold/leopold2.htm](http://www.cr.nps.gov/history/online_books/leopold/leopold2.htm); Sellars, 254-257; Pyne, *Fire in America*, 303.

<sup>766</sup> Larry Bancroft, "Fire Management in Everglades National Park," Aug. 1974, EVER-01385; Everglades National Park Fire Management Plan, Oct. 1973; Draft Everglades National Park Fire Management Plan, Sep. 2011, EFR.

started. If the fire needed to be contained, indirect methods would be used. The park's management biologist was given the authority to decide when a fire in Zone 2 or 3 would be contained. Strict limits were placed on the use of tracked vehicles to contain fires. The plan provided that research into fire behavior and fire ignition techniques was to continue. The plan would be kept current through a yearly review by the management biologist and district rangers.<sup>767</sup>

The 1973 Fire Management Plan contained a Prescribed Burning Plan for 1974 through 1979. It stated the goals of prescribed burning in the park as:

1. Reducing fuel loads, especially along the park boundary, to minimize chances of catastrophic fire.
2. Perpetuating a mosaic of subclimax vegetational communities.
3. Controlling Australian pine where feasible.
4. Restoring agricultural land in the Hole-in-the-Donut.

The plan included a schedule indicating which pineland blocks were to be burned from 1974 through 1979. In spite of Hofstetter's recommendation about burning in the wet season, the plan restricted controlled burns in pineland to October through January. The stated reason was a fear of disrupting wildlife reproduction, but the availability of seasonals in the winter probably played a role. This prohibition on wet season burning was dropped in the 1976 plan. Burns were also to be conducted so as to cause minimal inconvenience to visitors.<sup>768</sup>

An October 1974 Conference on Wildfire Management in South Florida and several follow-up meetings led to the creation of the South Florida Interagency Fire Management Council. The group was organized to provide a framework for interagency cooperation, information sharing, the promotion of appropriate fire management practices, and increasing public understanding. The council is made up of federal, state, and local governmental agencies from the tip of the Florida peninsula up through Charlotte, Glades, and Martin Counties. This has evolved into the South Florida Fire Planning Unit, which was organized pursuant to the National Fire Plan. Council members are the National Park Service, Bureau of Indian Affairs, Florida Park Service, Florida Department of Forestry, the South Florida Water Management District, and the Florida Fish and Wildlife Conservation Commission. At this writing, the council meets four times a year.

<sup>767</sup> Everglades National Park Fire Management Plan, Oct. 1973, EFR.

<sup>768</sup> Everglades National Park Fire Management Plan, Oct. 1973, EFR. Dir. George Hartzog was especially sensitive to the effect of smoke on VIP visitors to the park. Nathaniel Reed tells of hearing from park rangers that Hartzog strictly forbade burning in the winter and spring when VIPs were in the park. Reed called up Hartzog and suggested that he have the most attractive female park employees greet VIP visitors and explain to them the ecological benefits of controlled burning. It was not long before Reed was hearing praise from Congressmen about the "great things" being done with fire in Everglades National Park. Reed interview.

After the 1976 establishment of the South Florida Research Center, the park hired a fire ecologist, Dale L. Taylor. Taylor prepared a number of studies on the history and ecological effects of fire in the Everglades. Much of the fire-related work done by the SFRC and outside scientists in the 1970s focused on the seasonality of fire. Taylor's *Fire History and Fire Records for Everglades National Park, 1948-1979* (April 1981) contained a detailed analysis of the first three decades of fire in the park. Taylor also established a centralized repository of fire data in the park, which continues to be maintained. This fire data has now been digitized and placed in a GIS system that provides a comprehensive history of fires since establishment and the acreage burned. Taylor's work reinforced the idea that prescribed burning in the wet season most closely matched natural conditions.<sup>769</sup>

Scientists in the 1970s seemed to realize that humans had used fire in the area for thousands of years—presumably in the winter dry season as well as the summer. They were committed, however, to the idea of replicating the effects of lightning ignition. From the late 1970s into the early 2000s, the park burned largely in the wet season. By the late 1980s, a major emphasis of the park's fire team was to reduce fuel loads along the northern and eastern park boundary. The goals were to keep fires inside the park so they would not spread to built-up areas and to keep fires ignited outside the park from entering it. When Dale Taylor took a position with the Bureau of Land Management in Alaska in 1981 or 1982, the fire ecologist position in the SFRC was left vacant. It was re-established within the fire program in 2004, as detailed below. SFRC scientist Robert F. Doren did some work related to fire. During the 1980s, Sue Husari, trained as a biologist, was assistant fire management officer, then fire management officer and brought that perspective to the fire program. Through the early 1980s, the majority of controlled burns done within the National Park System were done in Everglades National Park and Big Cypress National Preserve. Over time it became apparent that ignition of prescribed burns using a helicopter was safer and more efficient than ground ignition. Park staff worked with USFS staff to develop an aerial igniter specifically adapted to South Florida conditions.<sup>770</sup>

The NPS produced its first separate statement of fire policy in 1978, with the release of *Director's Order 18: Fire Management Guideline (DO-18)*. Fires that burned nearly one million acres in Yellowstone National Park in 1988 had lasting effects on NPS wildland fire policies. The Service drew much negative, often ill-informed, press coverage because a few of the Yellowstone fires were prescribed burns that escaped containment. The public failed to understand that the majority of the damage resulted

<sup>769</sup> Dale L. Taylor, "Fire Records: Their Importance and Use in Documenting Fire History," EVER 42242; Jackson Weir, personal communication, July 19, 2012; Anderson interview.

<sup>770</sup> Dale Wade, John Ewel, and Ronald Hofstetter, *Fire in South Florida Ecosystems, Technical Report SE-17* (USFS Southeastern Forest Experiment Station, 1980), 37; Anderson interview; "Federal Review of Fire Policy Constrains Everglades Burns," *Miami Herald*, Nov. 6, 1988.

from lighting and accidental ignitions outside the park. In response, the NPS directed parks to temporarily suppress all fires while it reviewed its policies. The Departments of Interior and Agriculture produced a review report in 1989, which led to a 1990 revision of *DO-18*, titled *Wildland Fire Management Policy*. A second dual-agency review occurred in 1995. The 1998 revision of *DO-18* embraced the conclusions the 1995 review. NPS fire policies in this period moved toward requiring significantly more planning for and monitoring of both prescribed natural fires and prescribed management fires. Each new park fire management plan now had to be supported by an environmental assessment. Additionally, park fire management plans were to include a fuels management analysis and plan, and all prescribed management fires were to include monitoring programs to evaluate fire behavior, fire effects, and whether fire objectives were met. To help implement monitoring standards, the NPS in 2003 issued a *Fire Monitoring Handbook*. An important emphasis in the 1998 and 2003 documents was the need for objective-dependent monitoring—monitoring that gave some idea of whether the articulated goals of prescribed burning were being achieved.<sup>771</sup>

As a result of these systemwide initiatives and the growing interest in the restoration of the Everglades ecosystem, the park fire program added a formal fire ecologist position in 2004. Thomas Richard “Rick” Anderson, held the fire ecologist position from 2004 to 2008, when he became the park’s fire program manager. Since 2004, the fire program has emphasized increasing the efficiency and usefulness of monitoring, reworking national guidelines to better fit the unique conditions and challenges of the Everglades, and monitoring the effects of fire on specific ecosystem components. Inventory and monitoring of fire plots has been modified and streamlined. Staff increasingly have relied on precise photo monitoring, which limits the time staff have to spend on the ground in difficult conditions. Some of the guidelines in the *Fire Monitoring Handbook* are applicable primarily to western forests. While fallen limbs and sticks are important portions of the fuel load in many western areas, grass and palmetto are the primary fuels in the Everglades. Consequently, the park has ceased calculating the number and mass of fallen sticks in wetlands.<sup>772</sup>

As described above in chapter 12, the park provides habitat for a number of threatened and endangered species. The park’s fire management plan includes measures to protect these species, and planning and monitoring for management fires takes them into account. Many of the park’s endangered plants are found on hardwood

771 Bruce M. Kilgore, “Origin and History of Wildland Fire Use in the U.S. National Park System,” *George Wright Forum* 24/3 (2007):112-113; USDA and DOI, *Final Report of the Fire Management Policy Review Team* (Washington, D.C.: USDA and USDI, 1989); USDA and DOI, *Final Report: Federal Wildland Fire Management Policy and Program Review* (Washington, D.C.: USDA and DOI, Dec. 18, 1995); NPS, *Director’s Order 18: Wildland Fire Management Policy* (Washington, D.C.: NPS, 1990, 1995); NPS, *Fire Monitoring Handbook* (Boise: National Interagency Fire Center, 2003).

772 Anderson interview.

hammocks, and the fire plan stipulates that sensitive hammocks will be protected from naturally occurring fires and excluded from prescribed burns. The endangered Cape Sable seaside sparrow is found only within Everglades National Park, in several sub-populations. Park fire managers take care not to burn large proportions of sparrow habitat at one time and also work to reduce hazard fuel concentrations in or surrounding sparrow habitat. Recently, the endangered Bartram's scrub-hairstreak and Florida leafwing butterflies have become a management concern. The pinelands croton is the sole larval host for the former species. Reports by scientists in the 1910s and 1920s indicate that croton was considerably more abundant in that period. Planning for prescribed burns in the pinelands now takes into account the life cycle and health of this host species, and its regrowth and resprouting after fires are noted.<sup>773</sup>

The Miccosukee Tribe of Indians in Florida understandably has concerns about prescribed burning in nearby park areas. The tribe has its own fire management program and participates in the South Florida Interagency Fire Management Council. In the first decades of the park's prescribed burning program, the park was reluctant to burn areas where there was a risk of smoke or fire reaching tribal residential areas along the Tamiami Trail. Now that most tribal houses are on substantial concrete pads, the fire risk has diminished. It is important to reduce fuel loads in areas closed to the reserved area, and the park coordinates its burning with the tribe. Park fire managers in recent years have worked to accommodate the tribe's objectives in planning burns.<sup>774</sup>

The park's fire management program is hampered in that it is currently operating under an outdated 1995 fire management plan. Staff have been working on a new edition of the plan, including an environmental assessment, since the early 2000s. A final draft of the plan and environmental assessment is expected to be available for public comment by the end of 2014. The reasons for the delay in getting a new plan approved are many. The park has a small planning and compliance staff, which long was preoccupied with developing the park's general management plan, with the fire management plan receiving a lower priority. Without a current, approved plan, the park cannot burn in designated wilderness under ordinary circumstances. The park has 1.3 million acres of wilderness, making this a serious limitation. Fire managers protect Everglades wilderness values by applying minimum tools analysis to all planned activities in wilderness and the use of minimal impact suppression tactics for unplanned activities. Essentially this involves selecting the practice, tool, or equipment that has the least adverse impact on wilderness values. Fire managers also maintain a list of park historic structures and archeological sites and take care not to use ground-disturbing suppression methods where archeological resources are believed to exist. The park can burn more often in the pinelands of the 230-acre Boy Scout camp, because it is

<sup>773</sup> 1993 Fire Management Plan, 2011 Draft Fire Management Plan, EFR.

<sup>774</sup> Richard Anderson, personal communication, Nov. 8, 2013.

privately owned. This allows crews to refine ignition techniques and also compare the results of different fire return intervals as shown in figure 15-3.<sup>775</sup>

At times, the park has been able to burn in wilderness when it can be justified as a measure to control exotic vegetation. Since 2004, the fire team has put together a map detailing the dates of last burning throughout the park, known as a fire return interval departure map. Analysis of the map has revealed that some areas in the park have remained unburned for decades. The park's prescribed burning program began in the pinelands, and that plant community has traditionally received the lion's share of planned burning. A current priority is to do more burns in marshes and coastal prairies, within the limitations imposed by the lack of an approved fire management plan. More burns are now being conducted in the winter dry season as well. The park constitutes only a portion of the historical Everglades, and lighting ignitions in the park are few. Historically, many fires likely began outside the current park boundary and burned into what is now the park. This no longer occurs, because fire suppression is the rule outside of the park. If park staff conducted prescribed fire only in the wet season, they could not burn sufficient acreage to maintain what historically seems to have been an extensively fire-maintained landscape.<sup>776</sup>

The basic philosophy behind the park's fire management policies remains that fire is a natural process in the Everglades. Stated park fire management objectives are:



Figure 15-3. Different fire return intervals in pineland, 7-8 years on left, 2-3 years on right

<sup>775</sup> Anderson interview; 2011 Draft Fire Management Plan, EFR; Mayavati Tupaj, personal communication, June 27, 2014.

<sup>776</sup> Anderson interview.

1. Safeguarding the park's natural and cultural resources from the negative effects of fire and fire management activities.
2. Maintaining and restoring a healthy and sustainable ecosystem through science-based fire management.
3. Managing fires through monitoring and limiting fire suppression to the minimum needed to achieve resource benefits and public safety.
4. Using prescribed burns to maintain fire-dependent ecosystems, reduce hazard fuel loads, control exotic vegetation, and minimize the danger of fires entering or leaving the park.<sup>777</sup>

Park managers apply adaptive management principles to fire management. The operations of the fire management program are systematically monitored in a search for improvements and refinements that can be made. As of this writing, the program has 28 full-time staff and between 10 and 12 seasonal and subject-to-furlough positions. The park's four fire management units remain:

FMU 1, Coastal Prairie. Approximately 400,000 acres. About 97,000 acres of fire-dependent prairie, with the rest mangrove forest and Florida Bay.

FMU 2, River of Grass. About 405,000 acres, of which 326,000 acres are fire-dependent.

FMU 3, Pinelands. Approximately 55,000 acres, with 47,000 acres fire-dependent.

FMU 4, East Everglades. About 109,000 acres, of which 102,000 acres are fire-dependent (figure 15-4, fire management units).<sup>778</sup>

Everglades National Park's fire management activities are closely coordinated with other federal, state, and local agencies that have land management responsibilities in South Florida. The NPS, US Fish and Wildlife Service (USFWS), and Florida Forest Service (FFS) have a state-wide cooperative agreement pertaining to the management of wildland fire. Under the aegis of this agreement, a South Florida Annual Operating Plan is established among the NPS, the Fish & Wildlife Service, the Everglades District of the FFS, BIA, and the Seminole Tribe of Florida. The annual operating plan establishes a Mutual Response Zone along the eastern boundary of the park that enables all agencies involved to take initial attack actions. The Mutual Response Zone is now limited to the area between the park's east boundary and Canals 31 and C-131.<sup>779</sup>

<sup>777</sup> 2011 Draft Fire Management Plan, EFR.

<sup>778</sup> 2011 Draft Fire Management Plan, EFR; Jennifer Adams, personal communication, July 19, 2012.

<sup>779</sup> 2011 Draft Fire Management Plan, EFR; Weer interview.

## Fire Cache

A fire cache is a strategically placed supply of fire tools and equipment assembled in advance and maintained for use in fire management only. The park's first cache was in three bays of the CCC-era garage at Royal Palm Hammock. By the late 1950s, the fire cache had moved to the Pine Island maintenance area. In 1984, the fire cache moved to the Daniel Beard Center. When the SFNRC moved from the old Iori bunkhouse in the late 1980s, the park's fire team moved into the building and the fire cache was located in the nearby garage building.<sup>780</sup>

## Major Park Fires Since 1970

Everglades National Park experienced wildfires that burned substantial acreage in 1974, 1985, 1986, and 1989. In 1974, incendiary fires burned more than 62,000 acres within the park. The first major fire in Shark Slough since 1962 came in May 1985. The Panther Fire was ignited by lightning on May 16. It was judged to be within the prescription and allowed to burn. It was declared out on May 22, having burned 27,628 acres. The May 1986 Eleocharis Fire, started by lightning, burned 36,415 acres in the park. Severe drought conditions in 1989 resulted in two major fires. The Ingraham Fire began on May 17 with five separate lightning strikes and was contained on May 26. It burned 98,800 acres in the heart of the park. The DOF 457 Fire was an incendiary fire that began in the East Everglades north of Chekika State Park on June 13. It entered the park on June 17 and eventually burned 15,590 acres within the park and 28,110 acres outside the park.<sup>781</sup>

The largest fire to hit the park in 19 years was 2008's Mustang Corner Fire. This human-caused fire began on the morning of May 14, 2008, just east of the park boundary. The fire threatened nearby private property as well as habitat of the Cape Sable seaside sparrow. By May 18, the fire was sending heavy smoke over the community of Kendall and threatened to leave the park and hit a nearby prison. Under these circumstances, the park superintendent authorized the air drop of diluted fire-retardant chemicals. The fire was declared out as of noon, June 14, 2008, after having burned 39,465 acres. Prescribed burns done inside the park boundary in the years prior to this fire were important in reducing fuel loads. Absent those management fires, it would

<sup>780</sup> Form 10-768, Royal Palm Ranger Garage, Sep. 9, 1949, EVER 22965; ENP Fire Control Plan, Mar. 1966, EFR; Jennifer Adams, personal communication, July 19, 2012; SAR, 1984.

<sup>781</sup> SAR, 1974; Report on Panther Fire, 1986 Fire Occurrence Summary, Chairman, Fire Review Panel, to Supt., Jan. 19, 1990, EFR.

have been much more difficult to keep the Mustang Corner Fire away from populated areas.<sup>782</sup>

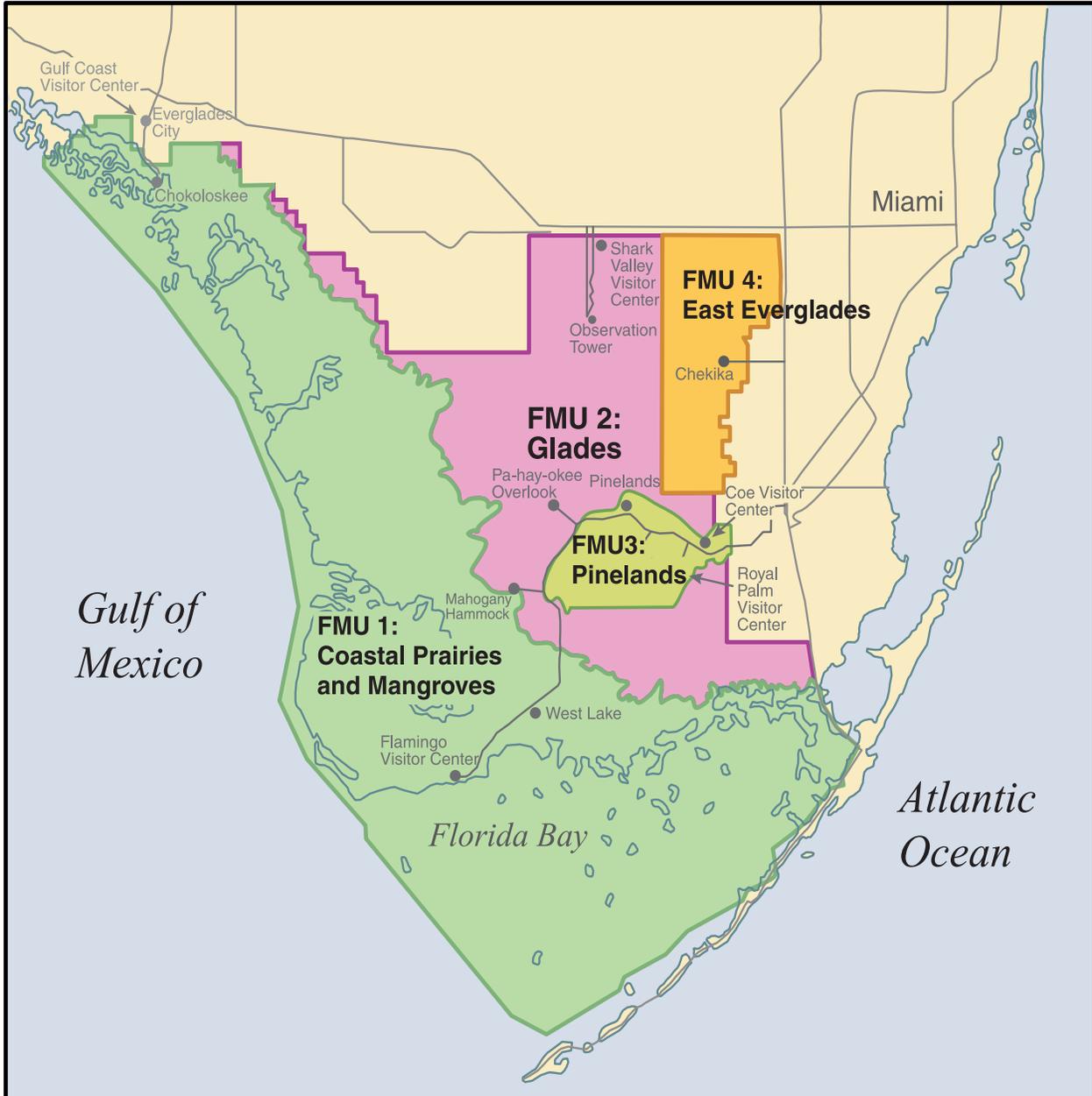


Figure 15-4 Fire Management Units

782 Mustang Corner Fire Report, June 18, 2008, EFR; “Everglades National Park Declares Mustang Corner Fire Out,” NPS media release, June 17, 2008; “Everglades Park Counts the Good and the Bad after a Blaze,” *New York Times*, May 23, 2008; Anderson interview.