3A.1 **PRESCRIBED BURNING BY THE FLORIDA PARK SERVICE**

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Abstract

The Florida Park Service (FPS) manages 490,000 upland acres scattered throughout 158 units. The FPS began burning in 1970 and has placed a strong emphasis on burning during the lightning season. Fire is viewed as a basic ecological necessity for all fire-type communities managed by the FPS, and an attempt is made to use fire on all fire-type acres, regardless of location. In 1986, the FPS had 89,000 acres of fire-type communities to manage. The FPS now manages over 235,000 fire-type acres (164% increase). Current focus is shifting to applying fire at anytime of year to reduce years of fire backlog versus a concentration on lightning season burning. Fire is used to perpetuate communities; to reduce fuel loads; to remove logging slash; to improve habitat for listed species; and to open vistas. Prescribed burning has become more complicated due to an increasing wildland-urban interface, environmental factors such as severe drought and southern pine beetle infestation, and air quality issues including smoke management and pollution levels. FPS has increased personnel training and contributed significant resources to acquiring state of the art fire equipment. FPS uses park staff and volunteers who are not solely dedicated to fire and does not rely on fire management staff. Since 1986, FPS has burned 536,000 acres compared to the 922,000 acres proposed for burning (42% shortfall). Ultimate success remains elusive due to increasing fire-type acreage, decreasing staff, increasingly complicated burns, and shifting priorities pulling staff away from fire programs. FPS remains committed to prescribed fire as it struggles to find ways to accomplish an ever-increasing task with ever-decreasing resources.

Introduction

The Florida Park Service (FPS) is part of the Florida Department of Environmental Protection (FDEP) and was founded in 1935. By 1938, there were 9 park units. The FPS has expanded into one of the largest and most heavily used state park systems nationwide. FPS now manages over 600,000 acres in 158 units statewide with an annual budget over $70 million, and with over 18 million visitors (cite web page).

The earliest recorded burns done by the FPS were at Oleno State Park in the 1940s when the park was a Forestry Training Camp. These burns were done in the back of the park, out of the public eye, and on days when the on-site forestry ranger was away. The main purpose of these burns was to “clean up” the forest to kill ticks and rattlesnakes (Clif Maxwell, pers. comm.) Despite this early start in the use of prescribed fire, the FPS did not officially begin prescribed burning until 1970 after 35 years of fire suppression. The 1970s condition of fire-type communities in the FPS was one of hardwood encroachment and dangerously high fuel loads. One of the first burns was an April burn in sandhills that quickly illustrated the largely unknown fact that wiregrass responds with prolific seeding to lightning season burning. That burn became the foundation of a FPS policy to increase prescribed burning in state parks and to work towards a concentration of burning in the lightning season (Stevenson 1996; Operations Procedures Manual). The policy of prescribed burning fire-type communities with an emphasis on lightning season burning remains the basis of FPS fire policy today. However, with a growing number of fire-type acres to manage, emphasis has shifted to applying fire throughout the year to reduce a growing backlog of fire-type acres overdue for burning. While overall fuel conditions have significantly improved, the FPS still manages fire-type acreage with high fuel loads.

Uses of Fire

Fire is used to accomplish a variety of objectives. The overriding goal is to maintain the natural ecological process of fire in ecological communities dependent upon a fire-disturbance regime. Fire is always viewed as the best management tool for fire-type communities, but other tools such as mechanical treatments and herbicide applications are also used to return areas to a condition where fire can be successfully applied. Within the overarching goal of restoring a fire management regime to fire-type communities, the FPS has a variety of reasons why a particular burn may be conducted.

The majority of the acreage burned by FPS is burned to maintain fire-type ecosystems. Fuel reduction burns may make up the highest number of burns but do not constitute the majority of the acreage treated with fire. A smaller number of burns have very specific objectives in addition to fuel reduction and community perpetuation. Specific objectives may include management for listed species such as fox squirrels (*Sciurus niger*), gopher tortoises (*Gopherus polyphemus*), Florida grasshopper sparrows (*Ammodramus savannarum floridanus)* and pitcher plants (*Sarracinia* spp.); establishment or maintenance of scenic vistas; removal of logging debris; preparation for community restoration plantings; control of exotics; and personnel training.

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Difficulties in Use of Prescribed Fire

As the acreage of fire-type community under management has increased, burning in Florida has become increasingly difficult. Florida is the 4th most populated state in the country experiencing a rapid rate (23%) of population growth (US Census Bureau). Due to Florida's rapid growth, the wildland-urban interface is rapidly encroaching on many park lands. Parks that were in rural areas in the late 1970s are now completely surrounded by moderate to high-density housing.

Parks are frequently islands of green in a sea of development, and the growth phenomenon is pervasive statewide. Wekiwa Springs State Park (SP) (Orange/Seminole Counties), Ft. Cooper SP (Citrus County), and Werner-Boyce Salt Springs SP (Pasco County), are typical examples of the accelerated urbanization of wildlands throughout Florida. The average rate of population growth from 1990 - 2000 in the counties surrounding these three parks is 27%, while the average state increase is 23% (US Census Bureau). Florida's rate of population growth is negatively impacting all state park lands.

Burns conducted in rapidly urbanizing areas have additional levels of complexity (NWCG 2002) **and** costs. The time and effort increases in every phase of conducting a burn. In advance of the burn, site preparation increases with the need for wider perimeter firelines; more time is spent waiting for appropriate weather conditions in order to minimize smoke impacts; and more time is spent on public relations preparing neighbors for the benefits and inconveniences of fire. Frequently burn areas must be decreased in size when burning in more urban areas, resulting in the need for more burn days to accomplish the same amount of burning. During the burn itself, more staff and equipment are needed on-site to conduct the burn and to satisfy public relations concerns; more time is spent in liaison with city and county fire departments; more time is required to accomplish a higher level of post-fire mop-up standard; and additional time is spent in continued public relations post-fire. A relatively simple, low acreage (<25 acres) burn can easily consume greater than 40 hours of preparation time when burning in an interface area. Interface burning is also more expensive than rural burning. As an example of increasing costs to burn in the interface/intermix areas of Florida, it cost $0.62/acre to conduct aerial burns in rural Okeechobee County compared to $1.05/acre for aerial burns in urban Orange/Lake/and Seminole Counties.

In addition to all the complications of applying fire in an urbanizing state, environmental factors and cycles in the last 5 years have been detrimental to the successful use of fire in state parks. Florida was under severe drought conditions from spring1998 to winter 2001/02. Burning statewide became very restricted despite the fact that historically periods of drought were when many of Florida's fire-type communities would have burned the most. So, even if a particular area was in excellent fuel conditions it may have been virtually impossible to obtain a burn authorization in spite of the fact that it may have been the best ecological time to burn. During this period of extended drought, many of Central and North Florida's pine communities experienced large outbreaks of southern pine beetle (spb) (*Dendroctonus frontalis)* infestations. While the extent of these attacks was certainly exacerbated by the drought, they were the direct result of overall poor forest health related to lack of fire management for decades. In 2001 alone, the FPS spent over $64,000 dealing with spb infestations statewide.

While environmental factors add more complexity to a fire program, the root of the problem is not the environmental conditions. The basic problem is the accumulation of excessive fuel over many years, which has lead to an increased basal area of pine overstories and thickets of hardwood competitors. If the forests were in a basically healthy state, insect outbreaks would be less severe, and fire managers would be able to burn under more severe weather conditions (assuming that a permit could be attained) with few adverse ecological impacts.

One environmental impact that even the best fire program can not compensate for is the increased problems with air quality conditions in urban areas. During dry spring high-pressure weather system patterns, ozone becomes trapped in the atmosphere. Without rain, ozone levels build up throughout the week until either it rains, or the weekend arrives and there are fewer cars on the roads. Many urban areas monitor ozone levels, and when readings become high, individual counties will request that a burn ban be in effect. These bans are instituted countywide and make no considerations for which direction prevailing winds may be traveling on any particular day. Accordingly, it makes no difference if smoke from a prescribed fire is likely to impact the ozone levels once a burn request has been made. These time periods frequently coincide with the beginning of the lightning season when "dry" lightning is not unusual. Historically, late spring/early summer was when the largest fires occurred in Florida, and was when many fire-type communities are ecologically adapted to burning. Although, late spring/early summer may indeed be the absolutely best time from an ecological sense to burn a well-maintained fuel condition fire-type community, human constraints may not allow that fire to take place.

Changing Impacts to FPS Fire Management Program

Since 1986 (the start of more thorough record keeping), the fire-type acreage under management by FPS has increased from 89,000 acres to 235,000 acres (164% increase). During the same timeframe, FPS staff has declined from 1.02 full time equivalents (FTE) per 100 fire-type acres to 0.45 FTE per 100 fire-type acres.

Visitation has increased from over 14 million to over 18 million (29% increase) and the number of parks from 128 to 158 (23% increase). During the same time period, state park management has become more complicated with more reporting requirements, an increase in the variety of recreational events hosted by parks, and emphasis on increasing visitation and facilities at parks statewide. These management changes can all act as a distraction to a successful fire management program and as a further exacerbation to the loss of FTEs.

During this period of increased stress on its fire program, FPS has retained a high level of commitment to its program. A number of large equipment purchases have been made including the purchase of 17 Type 6 engines between 1999 and 2000 for parks throughout the state. FPS has also changed its purchasing of resource management equipment to include larger tractors, ones more suited to woodland use versus agricultural type equipment; more implements such as roller-choppers, Brown's tree cutters, rototillers, shredders, and larger disks. Direct expenditures on prescribed fire increased 25% from 2000 to 2003. The fire program has expanded to include use of mechanical treatments and herbicides to augment the use of fire, and a new philosophy of not allowing a burn zone to remain overdue for burning year after year is beginning to take hold in the agency.

FPS is recognized as having fire management expertise and has provided its expertise to numerous engine strike team assignments where FPS provided 4 engines, 8 crew, and a supervisor to act in a supporting role for mop-up and initial attack for state and federal fire incidents statewide. FPS has also increased training opportunities and is very supportive of sending staff to fire training. Basic fire crew must complete basic firefighter training including S-190 and S-130. Burn managers must continue their training to include the Interagency Basic Prescribed Fire Academy and to become Certified Burn Managers. FPS has 125 Certified Burn Managers. FPS is an active cooperator in the Interagency Basic Prescribed Fire Academy and hosts several basic academies as well as an interagency Southern Area Wildland Engine Operations Academy that involves students and instructors from throughout Florida and the Southeast.

Successes and Failures

A definitive success has been the increase in specialized fire equipment available for use. Training and use of alternate labor sources are other successes. At least some sections of FPS have been very successful in utilizing volunteers or staff from other sections and agencies to augment lack of and decreasing staff. The recently formed Prescribed Fire Training Center has provided additional staff throughout the state. In the last two years, the PFTC has on average burned at 10 different state parks statewide, conducted an average of 38 burns, and burned an average of 5,541 acres in state parks (Phil Weston, pers. comm.).

FPS provides free training to many volunteers, treating them the same as permanent staff in many instances. Individual parks routinely forge cooperative arrangements with other state parks throughout the region, providing staff to augment burns at other parks on a routine basis in exchange for the same support when burning at their own unit. These mutually cooperative commitments need to be maintained and rewarded.

The agency allows the use of overtime to support the fire program. The agency remains committed to using the basic all-around ranger job class for burning with leadership from rangers, managers, and technical biological staff. The use of this variety of field employees aids the fire program by increasing the knowledge of fire throughout the field staff versus depending on specialized fire staff. The same people conducting the burns are writing the prescriptions, talking to the neighbors, preparing firelines, maintaining the equipment, and dealing with the aftermath of burn complications. The end result is a high level of staff expertise and ownership in the fire program.

FDEP has a James A. Stevenson Resource Manager of the Year award that recognizes significant resource management accomplishments by unit managers. While the award recognizes accomplishments in all areas of resource management, a successful fire program is certainly a key program in the selection process. This award provides recognition by the Florida Governor and Cabinet and financial award to the park.

An indirect measure of fire management success can be inferred by looking at the number of wildfires and wildfire acres in FPS during the 1998 severe fire season. During 1998, the state of Florida experienced 2,282 wildfires where 499,477 acres burned, costing over $130 million in suppression costs (Jim Karls, pers. comm.). FPS lands did not suffer the serious impacts during the 1998 wildfire season that many Florida public lands suffered. From February 1998 to July 1998, there were 36 wildfires recorded on state park lands. The average size of these wildfires was 212 acres with a range of <0.5 acres to 3,569 acres. The majority of wildfires (53%) were < 10 acres in size, with only 31% of the fires being > 100 acres in size. The small size of the majority of these fires attests to the lower fuel loads in many state parks as well as to the efficiency of on-site staff in responding to wildfires. The FPS assessed these wildfires as having no long-term adverse effects as long as plowed firelines could be repaired. The 1998 fire season clearly showed that prescribed burning was the most effective wildfire prevention tool.

Despite these successes, from 1986 to 2003, FPS has burned 594,510 acres compared to the 1,010,920 acres proposed for burning (42% shortfall). In June 2002, FPS

estimated that 85,756 acres out of 243,475 acres (35%) of the fire-type community acreage it managed statewide was in a burn backlog condition (acres where site-specific required or desired interfire interval has been exceeded = overgrown). In 2002, 72,103 acres were proposed for burning - 13,653 acres less than what was considered backlogged. Burn backlog acres are spread throughout most of the 86 parks with fire-type acreage. However, it is interesting to note that the 3 parks that contain over 43% of the total fire-type acres managed by FPS (Fakahatchee Strand, Kissimmee Prairie, and Myakka River) contain only 4% of the backlog acres.

Much emphasis has been placed on burning a certain number of acres statewide without a commensurate emphasis on making sure that acreage is spread over many park units. A small number of parks statewide contain a bulk of the statewide fire-type acres - 76% of system wide fire-type acreage is contained within 8 out of 86 (9%) parks. A successful fire year by these few parks can mask the failures of many parks when only looking at overall acres burned. While these 8 parks are important ecological diversity reservoirs, the other, smaller units with fire-type acres are also critical to maintaining biological diversity statewide and are where the true success or failure of the FPS fire program lies.

The FPS has a dual mission to provide recreational opportunities while preserving, interpreting and restoring natural and cultural resources. While management focuses on both recreational and resource management, there has historically been more consequences for failures in meeting recreational objectives rather than shortcomings in meeting resource management objectives. Failures in meeting recreational needs are immediately noticed by the public while many of the public are not as knowledgeable or aware of resource failures and can at times be openly hostile to resource management successes. FPS has probably not done a sufficient job at educating the public on the practices of resource management. Accordingly, there is less of a public constituency to support the parks in resource management efforts and to criticize shortcomings in resource management.

The Next Five Years – Where Do We Want to Be?

The FPS fire program is facing a huge challenge in the next 5 years. In the final analysis, FPS is taking steps in the right direction but it is not keeping pace with the demand. Unfortunately, prescribed fire is too rarely employed to meet land restoration needs. There are 3 major goals to achieving a more successful fire program.

Goal # 1: Completely eliminate the backlog of fire-type communities needing burning in the next 5 years. This could be accomplished by simply burning everything that was in a backlog condition and assuring that no new areas enter into a backlog status. A variation to a burn only strategy is to consider the use of other resource management treatments. Once a burn zone has reached a need to burn condition, if for some reason it can not been burned, it must have some kind of disturbance-related climax resetting treatment applied. Climax resetting treatments could include a mechanical treatment such as mowing or roller-chopping or a herbicide treatment to reduce hardwood densities. Fire is by far and away the best possible treatment choice, but out of necessity a particular burn zone would not be allowed to languish for years without receiving some kind of treatment.

Goal # 2: Increase the public's knowledge of resource management activities and necessities. The public is frequently unaware of the routine resource management activities needed to restore and maintain public lands. This lack of knowledge leads to public relations issues when a visitor sees activities thought to be inappropriate for state parks. The public's lack of knowledge can lead to a lack of support for resource management. Every park visitor should leave a park having at least a minimal understanding of what it takes to manage that particular park and what is special about the park. They should not only have a fun recreational day; they should also leave as a better informed citizen and potential ally.

Goal # 3: Develop resource management success criteria that are part of typical performance standards. The FPS has two basic product lines: recreational opportunities and preservation. To date, the research and development team for recreational opportunities has outperformed the preservation team. The challenge is to balance the two products and to possibly hold the recreational product back while the preservation product catches up.

Summary

Prescribed fire is the single-most powerful tool that the FPS can use to preserve and restore the natural lands under its management. The most lasting legacy for the FPS is to assure that it has been the best possible steward of the lands entrusted to its care and that its natural lands are in the best possible condition for perpetuity. That responsibility rests on the shoulders of every burn manager in the FPS. Ultimate success will not be attained unless every park with fire-type acres burns regularly and well.

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