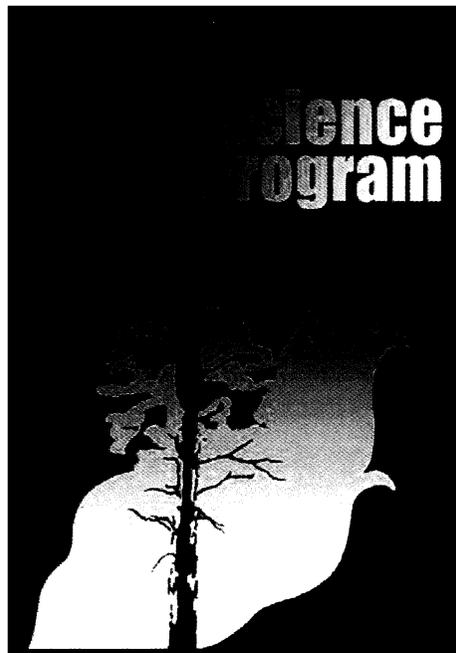


Annotated Bibliography of Fire and Fuels Management in Tropical Pine  
Rocklands and Subtropical Pine Flatwoods.

JFSP 05-S-02

2007



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"Public Perceptions and Attitudes Toward Wildland Fire."

Aimed at fire managers and others newly considering public opinion in regards to their work, this article introduces fire managers to the ways in which the way people think about wildland fire affects legal and financial components of their work. A brief overview of the way Americans have historically viewed fire is offered, with specific mention of the "10 a.m." suppression policy and the effects of the Smokey the Bear campaign. This article offers general support for the claim that public opinion about fire is an important aspect of fire management.

Abrahamson, W. G. (1991). "South Florida slash pine mortality in seasonal ponds." Florida Scientist **54**(2): 80-83.

This study investigated the possible causes of pine mortality where seedlings and saplings had moved into seasonal pond areas in Florida. High water tables may be a major factor in such pine mortality, as this may waterlog below-ground plant organs. The dense grass cover in those ponds can also cause fires intense enough to kill young slash pines, as can the pre- and post-fire precipitation.

Arno, S. F. a. J. K. B. (1989). "Managing fire in our forests--time for a new initiative." Journal of Forestry **87**(12): 44-46.

This brief article, written in 1989, makes a plea for national and institutional support of prescribed burning. Taking into account the catastrophic wildfires of both 1985 and 1988, the authors argue that fuels reduction, especially through prescribed burning, would make these wildfires easier to control. They divide forested areas into three management zones: Zone I, wilderness and natural areas; Zone II, general forest management, and Zone III, residential forest. For each of these zones, the authors recommend an appropriate treatment plan that makes sense for the surrounding community. This article reminds readers of the very recent struggles to make prescribed burning an acceptable part of forest management tools.

Barney, R. J. (1984). "Forest Fire Suppression Techniques: A Short History." Western Wildlands **10**(3): 26-29.

This paper, published in 1984, summarizes the changes in fire management policies since the beginning of the 20th century. Barney discusses detection systems and tools used in fire suppression. As he recalls the progress of fire research through the decades, Barney discusses the development of computer programs that predict and model forest fires, and the subsequent changes in the way human firefighters approach fires.

Behm, A. L., M. L. Duryea, et al. (2004). "Flammability of native understory species in pine flatwood and hardwood hammock ecosystems and implications for the wildland-urban interface." International Journal of Wildland Fire **13**: 355-365.

This study investigates the flammability of several key species in pine flatwoods and hardwood hammocks, two of the most commonly occurring ecosystems in the southeastern United States. Biomass and foliar characteristics likely to influence flammability are considered, like ignitability, sustainability, combustibility, and consumability. General conclusions suggest that understory species in pine flatwoods are more flammable, combustible, ignitable, and sustainable than understory species in

hardwood hammocks. More specifically, *Serenoa repens*, *Ilex glabra*, and *Lyonia ferruginea* are all particularly hazardous to wildland-urban interfaces for reasons of biomass and foliar energy content. This study suggests specific solutions to firewise planning for communities that are part of the wildland-urban interface.

Behm, A. L. a. M. L. D. (2003). Fire in the Wildland-Urban Interface: Considering Fire in Florida's Ecosystems. Fire in the Wildland-Urban Interface of the School of Forest Resources and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida., University of Florida Extension: Institute of Food and Agricultural Sciences; Center for Wildland-Urban Interface Research and Information, Southern Research Station: 1-14.

This publication attempts to educate Florida homeowners about wildfire, especially those residents in or near a wildland-urban interface. The paper describes each ecosystem in Florida, its relative fire risk, and what homeowners can do to protect their homes. The paper defines basic fire terminology and identifies fire-related flora in the state.

Brender, E. V. R. W. C. (1968). "Prescribed burning in Georgia's piedmont loblolly pine stands." Journal of Forestry **66**: 31-36.

This early study of prescribed burning on Georgia pines inquired both into the effectiveness of prescribed burning in fuel reduction and improved growth, and the type of burning techniques that were most effective and economical. Investigators noted that strip-head fires (as compared to backing fires) were more intense, cheaper, and could be used under a larger variety of weather and fuel conditions. However, they warned that backfires were a necessary caution in the case of fuel accumulated to 10 tons/acre and more. The researchers also noted that the most reliable criteria for anticipating the outcome of a burn were fuel volume, fuel composition, fuel moisture, and wind, in that order. In the case of this study, follow-up prescribed burns were found to be ineffective with only 1-2 years between burns.

Brenner, J. a. D. W. (1992). "Florida's 1990 Prescribed Burning Act." Journal of Forestry **90**(5): 27-30.

This article describes Florida's 1990 Prescribed Burning Act and the history leading up to it. The law authorizes and promotes the continued use of prescribed burning for ecological, silvicultural, wildlife management, and range management purposes. It also reduces civil liability for prescribed burners who follow regulations for burning. The article describes requirements for the written plan or prescription that is to accompany any prescribed burn. It also describes the certification courses that are available for prescribed burners, one of which is required at every prescribed burn in Florida.

Brenner, J. a. D. W. (2003). Florida's revised prescribed fire law: protection for responsible burners. Proceedings of Fire Conference 2000: The First National Congress on Fire Ecology, Prevention, and Management. Tallahassee, FL, Tall Timbers Research.

Brenner and Wade's update of their 1992 article includes a general overview of burning regulations in Florida. More specifically, they discuss the changes to the law in 1999 (most importantly, a change in language from burners being at fault only in the case of

negligence to only in the case of gross negligence) that further reduce the threat of lawsuits and liability for those executing prescribed burns.

Brockway, D. G. and C. E. Lewis (1997). "Long-term effects of dormant-season prescribed fire on plant community diversity, structure and productivity in a longleaf pine wiregrass ecosystem." Forest Ecology and Management **96**(1-2): 167-183.

This report details the results of a long-term experiment testing the results of prescribed burning at various intervals. The study site is at the Alapha Experimental Range in Berrien County, central Georgia. Though there were several different treatment intervals for different plots, the study results showed that generally, areas that had been prescribed burned had reduced proportions of gallberry, altering the species makeup of foliar cover. Grasses also tend to benefit from prescribed burning, and plant species diversity tends to increase as well. This article is useful both for the extremely long-term study results and for the biological information it provides, including an extensive list of species found in central Georgia.

Brockway, D. G., K. W. Outcalt, et al. (1998). "Restoring longleaf pine wiregrass ecosystems: plant cover, diversity and biomass following low-rate hexazinone application on Florida sandhills." Forest Ecology and Management **103**(2-3): 159-175.

In an effort to restore longleaf pine wiregrass ecosystems in Florida, these researchers tested the effectiveness of hexazinone application in reducing the density of Turkey Oak and shrubs. The researchers noted a dramatic decrease in the foliar cover of Turkey Oak after a low-rate hexazinone application, whereas turkey oak density doubled on untreated control plots. There was a less pronounced effect on shrubs. As a result of turkey oak reduction, foliar cover of wiregrass increased, and hexazinone application allowed for an increase in species diversity after a year of regrowth in treated areas. The authors suggest that this type of hexazinone application may be a useful treatment in selectively shifting the balance of competition for site resources to favor more desirable plant species.

Brose, P. (2001). Understory herbicide as a treatment for reducing hazardous fuels and extreme fire behavior in slash pine plantations. Eleventh Biennial Southern Silvicultural Research Conference, Knoxville, Tennessee, U.S. Department of Agriculture, Southern Research Station.

This article discusses the pros and cons of herbicide as an alternative to prescribed fire in Northern Florida. Brose and Wade suggest that herbicide treatment will reduce the rough in the long term, but may not provide some of the other benefits of prescribed fire like duff reduction and nutrient cycling. In addition, trees in areas treated with herbicide may be more susceptible to root mortality during drought-year fires.

Brose, P. and D. Wade (2002). "Potential fire behavior in pine flatwood forests following three different fuel reduction techniques." Forest Ecology and Management **163**(1-3): 71-84.

A comparative study of the effectiveness of prescribed burning, thinning, and herbicide application in Florida pine flatwoods, this study could be very useful to managers trying to decide on fuel reduction strategies. The authors conclude that prescribed fire is the best protection from stand-replacing wildfires followed by thinning, though both are relatively short-lived.

Brown, J. K. and J. K. Smith (2000). Wildland fire in ecosystems: effects of fire on flora. Ogden, UT, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

This general technical report is part of the rainbow series describing the effects of fire on soil, water, air, flora, fauna, and fuels. Chapters include "Introduction and Fire Regimes," "Fire Autoecology," chapters related to specific geographical areas like "Fire in Northern Ecosystems," and finally, "Global Change and Wildland Fire" and "Ecological Principles, Shifting Fire Regimes and Management Considerations." The book includes an appendix of common and scientific names of plant species, as well as a glossary of terms.

Butry, D. T. e. a. (2001). Prescribed fire in the interface: separating the people from the trees. Eleventh Biennial Southern Silvicultural Research Conference, Knoxville, Tennessee, U.S. Department of Agriculture, Southern Research Station.

This study was an attempt to learn about the people in communities affected by fire-both wildfire and prescribed burning-in Florida. The authors concluded that prescribed burning is likely to occur near younger, lower income, rural and heavily Caucasian residential areas. Wildfires, they found, tend to be more likely to occur in areas where residents have higher incomes, forests are fragmented and diverse, and where there is a lower percentage of government-owned land.

Cain, M. D. a. M. G. S. (2002). "Does prescribed burning have a place in regenerating uneven-aged loblolly-shortleaf pine stands?" Southern Journal of Applied Forestry **26**(3): 117-123.

This study examined the effects of three dormant-season burn intervals on natural regeneration in uneven-aged stands of loblolly and shortleaf pines. High, moderate, low, and no burn treatments were applied to four sites in Southeastern Arkansas with varying frequencies. Trees were most likely to survive if they suffered less than 60% crown scorch and were taller than 8 ft. The results suggest that recurring dormant-season burns were effective in reducing hardwood competition, and that combining prescribed burning with herbicide applied at 10-yr. intervals will produce more pine saplings and may be a better management technique than only burning. The authors also suggest timing the last burn in a series so that it coincides with a better-than-average pine seed crop and site disturbance from cycle harvest activities.

Caldwell, T. G., D. W. Johnson, et al. (2002). "Forest floor carbon and nitrogen losses due to prescription fire." Soil Science Society of America Journal **66**: 262-267.

As prescribed fire becomes more dominant in forest management policy, these researchers thought it important to investigate the effects of such fires on losses of volatilized Carbon and Nitrogen from the forest floor, along with nutrient losses and other changes to the soil. Experiments were conducted on three sites in the Sierra Nevada around the Tahoe National Forest, Incline Village, NV, and Glenbrook, NV. Researchers found that N volatilization during prescribed fire is the dominant mechanism of N loss from these systems, and that N emissions from prescribed fire in this area are relatively insignificant.

Carlson, P. C., G. W. Tanner, et al. (1993). "Fire in key deer habitat improves browse, prevents succession, and preserves endemic herbs." Journal of Wildlife Management **57**(4): 914-928.

The authors of this study argue that a decline of Key deer (*Odocoileus virginianus clavium*) is at least partly attributable to poor habitat quality caused by fire suppression policies. Prescribed burning provided short term benefits to the deer in nutritive quality, and long term benefits in browsing quality. The authors also note that regular burning prevents forest succession, which benefits the deer as well. They suggest an experimental regime of prescribed burning intervals and maintenance stands of a variety of successional stages.

Carpenter, E. H., J. G. Taylor, et al. (1986). "Targeting audiences and content for forest fire information programs." Journal of Environmental Education **17**(3): 33-41.

This group of researchers surveyed members of the public in Tucson, Arizona about their beliefs regarding the effects of forest fire and about its management. They focused primarily on five subject areas: fire origin, fire intensity, fire area, animal mortality, and beneficial effects of fires. They also measured responses to different types of fires—those already burning, underbrush and debris fires, and manager fires. The most important conclusion reached from this survey is that as more information is provided about what the fire is doing and who is controlling it, the more approval there is for allowing it to burn. The survey also indicated that fire education should be aimed at a broad cross-section of the population, instead of at specific groups previously assumed to be more prejudiced against the use of fire.

Carrington, M. E., J. J. Mullahey, et al. (2000). "Saw palmetto (*Serenoa repens*): An emerging forest resource in the Southern United States." Southern Journal of Applied Forestry **24**(3): 129-134.

The authors of this paper reconsider the importance of saw palmetto as an income-generating forest product. Because of the new, or renewed, interest in the fruit of the saw palmetto as a drug to treat benign prostatic hyperplasia (enlargement of the prostate), forest management plans would need to take into account the life cycle of the saw palmetto. Under some conditions, prescribed burning can benefit the plant's fruit production, though in subsequent years after a burn the plant may produce less fruit while it recovers. For optimal fruit production, areas with saw palmetto should be burned every five to eight years, and no more than once every four years. This paper gives a broad overview of the new industry of saw palmetto harvesting, and contains information that could alter forest management plans in areas rich in saw palmetto plants.

Chapman, H. H. (1912). "Forest fires and forestry in the southern states." American Forestry **18**: 510-517.

In this early article about management of Southern pine forests, Chapman suggests that the Northern policy against all fire should not be adopted for the South. While he feels that total prevention is appropriate in Northern forests, he argues that there are beneficial kinds of fires in the South. He begins to articulate an early prescribed burning policy with ideas about climate and time of year of burn. Though this article is clearly out of date, it

provides interesting background on contemporary beliefs about burning.

Conard, S., T. Hartzell, et al. (2001). "Changing fuel management strategies--The challenge of meeting new information and analysis needs." International Journal of Wildland Fire **10**(4): 267-275.

Following an overview of the history of fire in North America, the authors of this article discuss the increased need for better risk analysis and information technology about fire prone ecosystems. They discuss the creation of the Joint Fire Sciences Program and its four major goals: fuels inventory and mapping, evaluation of fuel treatments, scheduling of those treatments, and monitoring and evaluation. They go on to discuss specific improvements to GIS and remote sensing as well as monitoring systems, and address such issues as optimal frequency, accuracy, and availability of data gathered by these systems.

Cortner, H. J., et al. (1984b). "Public Support for Fire-Management Policies." Journal of Forestry **82**(6): 359-365.

Considering the importance of public support for prescribed burning campaigns, this early survey asked residents of Tucson, Arizona a series of questions about their fire knowledge and attitudes toward fire management. The survey results found considerable support amongst Tucson residents for fire as a component of forest management plans. The survey also indicated that "prescribed fire" was a familiar term to a majority of residents, though many people were not familiar with principal causes and average intensities of fire in the area. The survey also acted as an educational tool for residents that participated, increasing their knowledge of fire in the process. This survey was used to develop appropriate educational materials about prescribed fire for members of Tucson's public, and though the article is brief it highlights the importance of public education campaigns in forest management policy.

Cox, A. C., D. R. Gordon, et al. (2004). "Understory restoration in longleaf pine sandhills." Natural Areas Journal **21**(1): 4-14.

This study investigated preparation and sowing methods for reestablishing dominant understory species in disturbed sandhills areas of Northern Florida. Results suggest that this process is enhanced by a combination of prescribed burning and irrigation of soil, and when seed was applied with a hayblower and subsequently rolled into the soil. The study suggests that restoration of native grasses is highly possible, though it does not cover a wide enough range of sample areas to make broad prescriptions for restoration in a range of areas.

Crow, A. B. and C. L. Shilling (1980). "Use of prescribed burning to enhance southern pine timber production." Southern Journal of Applied Forestry **4**(1): 15-18.

This early article makes an argument for prescribed burning as a vital component of fire management policy. It highlights the advantages of prescribed burning in site preparation, control of unwanted vegetation, control of diseases, thinning, and increasing growth and yield of pine. This article, while not up-to-date, is useful in considering the recent switch to a pro-prescribed burning attitude in fire management.

Cumming, J. A. (1964). "Effectiveness of prescribed burning in reducing wildfire damage during periods of abnormally high fire danger." Journal of Forestry **62**: 535-537.

Following a destructive fire in New Jersey in 1963, surveys were made of previously prescribed burned areas and of untreated areas in nearby forests in the state. The survey results suggested that fire intensity was reduced in areas that had been prescribed burned, and that damage from fires was also reduced, especially in areas burned within three years. This is valuable as an early article arguing for the increased use of prescribed burning in forest management policy.

Custer, G. T., James (1996). "Stand-replacement burn in the Ocala National Forest--a success." Fire Management Notes **56**(2): 7-12.

This article describes an unusual prescribed burn. Set in the sand pine and scrub oak ecosystem of Florida, its aim was total consumption and fire temperatures high enough to open sand pine cones. The authors compared their desired outcome to "the fastest spreading wildfire in the history of the USDA Forest Service" in 1935 in the Ocala National Forest. The article details the ways in which researchers prepared for the burn and researched the environmental conditions needed and manner of implementation. The article ends with educational data that encourages support of prescribed burning.

Davis, L. S. and R. W. Cooper (1963). "How prescribed burning affects wildfire occurrence." Journal of Forestry **61**: 915-917.

This paper, interesting because it was written fifty years ago, asks what the optimal fire return time period is when using prescribed burning. The authors note that, in their experimental plots in North Florida and South Georgia, rate of fire occurrence increases as age of rough increases and rate of acreage burning by wildfires increases as rough becomes older. They also write that fuel accumulations of 3 years or fewer supported fewer and less intense fires as well as a lower burn percentage, though the authors warn that fire management plans should be created with the specific forest ecosystem and its unique characteristics in mind. They suggest, generally, that roughs should be kept below 5 years of accumulation.

DeCoster, J. K., W. J. Platt, et al. (1999). Pine savannas of Everglades National Park--An Endangered Ecosystem. Florida's Garden of Good and Evil: Proceedings of the 1998 Joint Symposium of the Florida Exotic Pest Plant Council and the Florida Native Plant Society., West Palm Beach, FL, Florida Exotic Pest Plant Council.

This project sought to examine the effects of varying prescribed burn regimes on the rare Rockridge pine savannas of Long Pine Key, Florida. Researchers hoped to discover species composition for these areas, environmental factors that influence those species, and how fire plays into the equation. Generally, they found high levels of species diversity in the area, and that fire-suppressed areas have significantly lower species diversity. The authors also suggest what they think the fire history of the area might be, and suggest further research for the area.

Dixon, W. N., J. A. Corneil, et al. (1984). "Using stem char to predict mortality and insect

infestation of fire-damaged slash pines." Southern Journal of Applied Forestry **8**(2): 85-88.

The authors examined a stand of trees damaged by a wildfire in Levy County, Florida. This study suggests that magnitude and rapidity of tree mortality are directly related to severity of char on the stem.

Doolittle, M. L. and M. L. Lightsey (1979). *Southern WoodBurners: A Descriptive Analysis*. New Orleans, L.A., United States Department of Agriculture, Southern Forest Experiment Station.

This article is interesting in that it examines "woods-burning" as an illegal, vigilante/community activity that is neither completely condemned nor quite legal. The authors identify woods-burners as white males of two age groups, young adults and middle-aged men. Community interviews as well as some interviews with the woods burners illustrated community approval of most burning, with reasons given for the ecological necessity of the act. The authors also examine community and woods-burners' opinions about various types of landowners, including private, corporations, state, and USDA Forest Service. It is interesting to consider the goal of this investigation, to change prevailing community attitudes about burning, from the perspective of a pro-burning current policy for reducing hazardous fuels, among other purposes.

Doran, J. D. (2003). *Fuel Reduction Options for Landowners at the Wildland-Urban Interface*. Gainesville, FL: University of Florida, University of Florida: 58.

This basic introduction to hazardous fuel at the wildland-urban interface seems to appropriate for homeowners as well as land managers. It explains such basic terms as "fuel" and "wildland-urban interface," and introduces the reader to management techniques including prescribed fire, herbicide treatments, mechanical treatments, and livestock. Photographs included in the report offer examples of some of these management techniques, and at the end two appendices list commonly used forestry herbicides and herbicide prescriptions.

Doren, R. F., W. J. Platt, et al. (1993). "Density and size structure of slash pine stands in the everglades region of south Florida." Forest Ecology and Management **59**: 295-311.

This paper considers the size and density of three variations of south Florida slash pine stands in Everglades National Park and Big Cypress National Park in relation to the stands' logging and fire management history. The authors suggest that earlier fire management has converted many of these stands into uniform size and density, and propose that in order to maintain variable density, fires must more closely resemble pre-settlement fires, with burning in different seasons to allow for new growth.

Drewa, P. B., W. J. Platt, et al. (2002). "Fire effects on resprouting of shrubs in headwaters of southeastern longleaf pine savannas." Ecology **83**(3): 755-767.

This project examined shrub resprouting in the context of varying fire season and frequency, geography, habitat, and underground organ morphology. On two sites in Florida and Louisiana, researchers burned plots either during dormant or growing seasons, then burned them again two years later, and measured responses of shrub stems in each case. Findings suggested that postfire resprouting potential is less associated with the fires themselves than with variables like stem sizes, visible buds, and underground

plant structures. In addition to returning to a management regime that includes growing-season fires, the authors suggest that more drastic measures like herbicide application may need to be taken in order to control shrub density and restore ground cover communities.

Duever, L. C. (1984). "Natural Communities." Palmetto: 8-11.

This article describes several "natural communities" as agreed upon by the Florida Natural Areas inventory. Specifically, the article addresses three types of Pine Rockland in Florida: Keys Pine Rockland, Dade Pine Rocklands, and Big Cypress Pine Rocklands. Descriptions are also offered of Rockland Hammocks and Coastal Rock Barren. For each of these communities, Duever describes species composition and location of communities that fit these criteria. Many of these are "critically endangered" communities.

Finney, M. A. (2001). "Design of regular landscape fuel treatment patterns for modifying fire growth and behavior. ." Forest Science **47**(2): 219-228.

This investigation was conducted to "Find a regular pattern of treatment that produces the greatest reduction in overall fire spread rate with a minimum of treated area." The authors conclude that there is an ideal pattern of overlapping units of treatment that reduces fire spread by splitting the heading fire. This paper involves extensive math and computer analysis, and would be useful primarily to those preparing a specific treatment plan.

Franklin, S. B., P. A. Robertson, et al. (2003). "Prescribed burning effects on upland *Quercus* forest structure and function." Forest Ecology and Management **184**(1-3): 315-335.

Succession without fire has left its mark on upland *Quercus* forests, and some researchers have suggested that management plans focusing on disturbance can maintain *Quercus* dominance. The authors of this study investigated the capabilities of prescribed burning, herbicide application, and thinning treatments to restore forest structure and composition to stands in Kentucky and Tennessee. They suggest that periodic burning and/or herbicide application prior to overstory removal would be a combination of treatments suitable to sustainable oak forest management.

Fule, P. Z., A. E. M. Waltz, et al. (2001). "Measuring forest restoration effectiveness in reducing hazardous fuels." Journal of Forestry:(24-29).

This report details a forest restoration project conducted at the Mt. Trumbull Study site north of the Colorado River, beginning in 1995. Forest restoration here includes thinning of young trees followed by prescribed burning. Researchers also considered the effects of fires that burn under extreme-weather conditions as compared to regular weather patterns. Restoration treatments did make stands more crown-fire resistant, and the authors argue for forest restoration as a successful fuel reduction technique.

Glitzenstein, J. S., D. R. Streng, et al. (2003). "Fire frequency effects on longleaf pine (*Pinus palustris*, P. Miller) vegetation in South Carolina and northeast Florida, USA." Natural Areas Journal **23**(1): 22-37.

The authors of this paper address debate on fire frequency, and discuss the various theories regarding burning as forest management, including the dominant theory known as the Most Frequent Fire Hypothesis (MFFH); Intermediate Disturbance Hypothesis

(IDH), the hypothesis that fire effects plateau, and the saturation Hypothesis (SH). Once it is established that prescribed fire is good policy, managers still must determine the season and frequency of burning. Specifically, this paper considers the shift in species composition that occurs as a result of various burn treatments. They note that Spodosol Flatwoods and Ultisol Flatwoods respond differently to the same fire frequency treatments.

Greenberg, C. H. (2003). "Vegetation recovery and stand structure following a prescribed stand-replacement burn in sand pine scrub." Natural Areas Journal **23**(2): 141-151.

This project measured vegetation and stand structure of sand pine scrub in Central Florida before and for eight years after a stand-replacement prescribed burn on the area. Within 16 months after the fire, shrub species composition and cover values were near preburn values. Eight years after the fire most conditions had returned to those of the area before the burn. The author suggests that high-intensity disturbance allows a brief opportunity for establishment by gap specialists, but does not change the long-term composition of the stand. She also suggests that fire intensity may be more important than season of burn, and that this project suggests the usefulness of high-intensity burns.

Greenberg, C. H. and R. W. Simons (1999). "Age, composition, and stand structure of old-growth oak sites in the Florida high pine landscape: Implications for ecosystem management and restoration." Natural Areas Journal **19**(1): 30-40.

Fire suppression policies have resulted in degradation of remaining high pine ecosystem remnants, and this project samples the tree age, species composition, and stand structure of four high pine sites in central peninsular Florida. One of the goals of this project was to define restoration objectives by balancing out the possibly biased historical record (by early naturalists) with more complete data collection methods. The results suggest that sandhill oak trees have been an integral component of some high pine ecosystems, and that spatial patchiness and variability in fire frequency, season, and intensity historically permitted oaks to reach and maintain tree size in varying densities in these ecosystems.

Grelen, H. E. e. a. (1984). Response of slash pines to grazing from regeneration to the first pulpwood thinning. Third Biennial Southern Silvicultural Research Conference, Atlanta, GA, U.S. Department of Agriculture, Southern Forest Experiment Station.

This study, begun in 1960, aimed to evaluate the long-term reciprocal effects of managed yearlong grazing and slash pine regeneration in Louisiana. Survival and growth were compared for trees on grazed and ungrazed fenced exclosures. Prescribed burning was used to attract cattle away from freshly planted areas, though it is not mentioned as a fuel reduction technique. The authors note that the tree densities at age 18 were greater on the grazed plots than on the ungrazed plots, and attribute that difference to hotter fires accompanying heavier fuel buildups in ungrazed plots.

Gunderson, L., D. Taylor, et al. (1983). Fire effects on flowering and fruiting patterns of understory plants in pinelands of Everglades National Park. N. P. S. S. F. R. Center, National Park Service South Florida Research Center, Everglades National Park.

This study evaluated fruiting and flowering of understory species following fire in the pinelands of Everglades National Park. Specifically, the study was conducted at Long

Pine Key, and researchers examined three groups of plants: herbs, small shrubs, and large shrubs. Two kinds of effects from fire were recorded: one was that flowering and fruiting occurred at a higher rate in the more recently burned (9 months since burn) plot except in the case of hardwood species, and the second was that a lower level of activity was observed in the 9-month plots. Researchers used these results to suggest optimal “windows” and fire return periods for management practices.

Gurevitch, J., L. L. Morrow, et al. (1992). "A meta-analysis of competition in field experiments." The American Naturalist **140**(4): 539-571.

This article explores the use of a new analytical tool, meta-analysis, in synthesizing information about the influence competition on organism’s biomass collected in various experiments over the last ten years. Generally, they noticed that competition has a large effect overall, though there were differences in trophic effects due to competition. This wide-ranging and detailed report included information about competition for many different species of plants and animals. The authors noticed, among other trends, a heterogeneity among studies and suggest that such a trend can be inflated by poor experimental design and analysis and unclear reporting of data. The authors suggest that this should be investigated further. They also note a need for further study of terrestrial herbivores and carnivores, as well as intraspecific competition.

Haines, T. K. and D. A. Cleaves (1999). "The legal environment for forestry prescribed burning in the South: regulatory programs and voluntary guidelines." Southern Journal of Applied Forestry **23**(3): 170-174.

This article considers regulation of and liability protection for prescribed burning in the Southern states. Legal basis for burning regulation can be divided into four areas: air quality law, forest fire control law, general tort law, and environmental laws. The authors discuss prescribed burning in the context of each of these, and describe the areas of liability to which burners are exposed, including escaped fires, smoke intrusions, and smoke-related highway accidents. Familiarity with policies and restrictions regarding prescribed burning are especially useful to forest managers in Florida, and this is a good introduction to the various areas of law and regulation in which managers should be versed.

Hanula, J. L., J. R. Meeker, et al. (2002). "Association of wildfire with tree health and numbers of pine bark beetles, reproduction weevils and their associates in Florida." Forest Ecology And Management **170**(1-3): 233-247.

Following the wildfires that burned over 200,000 ha of Florida forest lands in 1998, these researchers set out to study the relationship between forest fires and pine feeding insects—particularly beetles—in the South. Contrary to their hypothesis, bark beetles did not build up populations in fire-damaged areas and then move into nearby undamaged forest areas. Specific data about types of beetles and fire damage severity are provided in the article, though generally the authors suggest that percentage of root infections in trees with moderate to high fire damage might lead to continued delayed mortality for the trees.

Haywood, J. D., J. C. Goetz, et al. (2003). "Influence of fertilization, weed control, and pine litter on loblolly pine growth and productivity and understory plant development through 12 growing seasons." Canadian Journal Of Forest Research-Revue Canadienne De Recherche Forestiere **33**(10): 1974-1982.

In central Louisiana, researchers applied three treatments to seedling loblolly pine plots: controls of no treatment versus fertilization, herbicide, and pine litter applications. This was repeated through 12 growing seasons. Results were that fertilization or herbicide increased growth; fertilizer and litter had the greatest yield; and herbicide and litter adversely affected pine growth. Results also suggest that logging debris can be reduced by mulching then dispersing the debris where controlled burning is not possible, and in combination with fertilizer application, this can be a beneficial management technique. The authors suggest that fertilizer is the best single treatment, where funding constraints limit managers to only one choice.

Haywood, J. D. e. a. (2004). Restoring upland forests to longleaf pine: Initial effects on fuel load, fire danger, forest vegetation, and beetle populations. 12th Biennial Southern Silvicultural Research Conference, U.S. Department of Agriculture, Forest Service, Southern Research Station.

This project investigated the effects of various forest management options on fuel load, fire danger, vegetation, and beetle populations in several types of pine. The results of the study suggest that single burns do not change overall fuel conditions, that in areas where bark beetles are active prescribed burning should be postponed as burning can actually increase beetle activity, and that stands should be managed with a mixed management policy of thinning followed by repeated burning. They also offer a prescription for burning that should result in uneven aged longleaf-pine dominated overstories and rich herbaceous understories.

Hendricks, J. J., C. A. Wilson, et al. (2002). "Foliar litter position and decomposition in a fire-maintained longleaf pine-wiregrass ecosystem." Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestiere **32**(6): 928-941.

The focus of this study was on the understory necromass which serves as a fire's primary fuel and contains Carbon, Nitrogen, and Phosphorus. Researchers sought a better understanding of the patterns and controls of biologically mediated foliar litter mass and nutrient dynamics in longleaf pine-wiregrass ecosystems. Their project was conducted in Baker County, Georgia on a fire-maintained ecosystem. Results of the study suggest that current fire regimes (burning at 1-3 year intervals) may balance N losses via volatilization with P limitations via litter accumulation and immobilization. They also advise that use of longer fire return intervals to conserve C and N might have adverse effects on ecosystem structure.

Heuberger, K. A. and F. E. Putz (2003). "Fire in the Suburbs: Ecological Impacts of Prescribed Fire in Small Remnants of Longleaf Pine (*Pinus palustris*) Sandhill." Restoration Ecology **11**(1): 72-81.

Considering the density of golf courses in Florida, it is important to consider the ways in which they can affect or be affected by ecological demise or restoration. These researchers considered the ways in which small longleaf pine fragments that existed on or

next to a golf course could be restored with prescribed burning. They also emphasize the educational value that such restoration projects could have for residents of such a community. In this particular experiment, researchers prescribed-burned ten small patches of remnant longleaf pine, and found generally that *Quercus hemisphaerica* (Laurel Oak) densities were diminished by about 30%, while fire had little to no effect on sandhill tree species like longleaf pine. They also found that prescribed burning of small remnant patches led to greater densities of flowers post-burn, and noted particularly the increase in flowering of “showy” species, which might encourage residents of these communities to support prescribed burning.

Hodgkins, E. J. (1958). "Effects of fire on undergrowth vegetation in upland southern pine forests." Ecology **39**(1): 36-46.

Hodgkins begins by summarizing the information gathered so far about prescribed burning in southern forests. He then describes a series of experiments in Fayette, Alabama on stands of loblolly and shortleaf pine. Following several prescribed burning treatments, the author draws conclusions about effects of fire on trees according to diameter at breast height, tree height, and time of year during which burn was conducted. He also discusses stand and understory recovery following prescribed burning. While out-of-date, this paper is useful in considering the early research conducted regarding prescribed burning.

Holmes, T. P., J. P. Prestemon, et al. (2004). Using size-frequency disturbance to analyze fire regimes in Florida. 22nd Annual Tall Timbers Fire Ecology Conference: Fire in Temperate, Boreal, and Montane Ecosystems, Tall Timbers Research Station.

In this project, lightning-ignited natural forest fires were examined in flatwoods and swampwoods fuel types. They were interested in the effectiveness of fire suppression in extreme fire years versus average fire years. Specifically, they were looking for a power-law distribution pattern in wildfires; very basically, whether larger fires were more difficult to control per unit of burn than smaller fires. They found that in extreme fire years catastrophic fires made up a larger percentage of area-burned totals than in normal fire years. Specifically, fires equal to or larger than a 640 ha area for flatwoods fires and a 290 ha area for swamp fires tended to “explode” into catastrophic, difficult to control fires. Because extreme fires are so difficult to control, these researchers are attempting to find the identifying traits of such fires so that appropriate management plans can be made for each possible type of fire.

Hooper, R. G. (1988). "Longleaf pines used for cavities by red-cockaded woodpeckers." Journal of Wildlife Management **52**(3): 392-398.

This study examines habitats preferred by red-cockaded woodpeckers, and suggests that the best pines for their usage are at least ninety five years old. In relation to hazardous fuel management, this study indicates that prescribed burning should be conducted in such a way as to preserve some of these older trees as valuable woodpecker habitats.

Huffman, J. M., W. J. Platt, et al. (2004). "Fire history of a barrier island slash pine (*Pinus elliottii*) Savanna." Natural Areas Journal **24**(3): 258-268.

Researchers investigated, via dendroecological examination, the historic fire frequency in

a slash pine savannah on St. George Island, a barrier island off the coast of northern Florida. They identified periods of various fire frequencies on the island, including the average fire return interval for each period. According to results of this study, barrier island fire regimes probably included frequent growing season fires. The researchers suggest that prescribed fires may be needed on barrier islands to reduce fuel loads and shift to a natural fire regime, and then should not be needed after those goals are accomplished.

Hughes, R. H. (1975). The native vegetation in South Florida related to month of burning. Asheville, NC, USDA Forest Service Southern Experiment Station.

Two studies, completed in 1969 in the pine-palmetto flatwoods of southwest Florida, were designed to measure the effect of periodic range burning to increase herbage available to livestock. The report offers detailed findings from the experiments, including the fact that May burns produced three times more early growth than November burns on range without trees. Low rainfall affected herbage production negatively, and species composition varied depending on the amount of tree cover in the experimental areas. The authors concluded that "the usual season for prescribed burning may be extended to include the November through May period without harming the trees" and that fall burning is the best choice where wildlife habitat is desirable.

Jacobson, S. K. and S. B. Marynowski (1997). "Public attitudes and knowledge about ecosystem management on department of defense land in Florida." Conservation Biology 11(3): 770-781.

Eglin Air Force Base in Florida shifted toward an ecosystem management: a management scheme that seeks to integrate planning, decision-making, research, public involvement, and management into a comprehensive system. Because this would bring about changes that would affect local users including increased prescribed burning regimes, this study was developed as a precursor to a public education campaign in the area. Methods of assessment included interviews, written and oral surveys, workshops, public meetings, and other data collection. Results suggested a lack of knowledge about local native and endangered species, forest resources and habitats, and the functions of disturbance regimes in local ecosystems. Most surveyed held more positive attitudes toward issues with which they had had direct experience. Because of the demographics of respondents, the authors suggest that these stable middle class residents would be good targets for an educational program.

Jacobson, S. K., M. C. Monroe, et al. (2001). "Fire at the wildland interface: the influence of experience and mass media on public knowledge, attitudes, and behavioral intentions." Wildlife Society Bulletin 29(3): 929-937.

Recognizing the importance of public opinion and support in executing prescribed burning management plans, this study surveys Floridians at the wildland-urban interface in order to understand their knowledge, intentions, and behavioral intentions toward fire and prescribed burning. This was conducted following the catastrophic wildfires of 1998 and the corresponding media coverage that survey participants were probably exposed to. Results show similar responses in knowledge between counties heavily affected by fires and those less affected; one third to one half of respondents would take action to defend their homes from fire; and residents saw harm to wild animals and spread to adjoining

property as the greatest risks to prescribed fire. Results suggest that education programs need not be targeted at specific areas as knowledge was consistent across geographical areas, and that communications should seek to provide data about the outcomes associated with fire to counter common misconceptions.

Kalabokidis, K. D., S. Gatzojannis, et al. (2002). "Introducing wildfire into forest management planning: towards a conceptual approach." Forest Ecology And Management **158**: 41-50.

These scholars, two of which are from Greece, discuss wildfire potential as a function in inventory and evaluation methodology of forest resources management. Using techniques from systems analysis, they divide phenomena affecting fire occurrence and growth into internal and external factors, and using rating techniques they hope to be able to predict a function class that describes fire danger and fire resistance of unit areas that can be mapped onto an existing forest. This very theoretical methodology works toward a practical application in prediction and management of fire-prone areas of forest.

Kimmerer, R. W. and F. K. Lake (2001). "Maintaining the mosaic - The role of indigenous burning in land management." Journal of Forestry **99**(11): 36-41.

This paper investigates the history of indigenous beliefs about fire in North America, and considers the ways in which those beliefs have and have not been recognized by mainstream American history. The authors discuss the extent and goals of indigenous burning, then relate that information to current American thought regarding fire. They also discuss the evidence of native burning practices, then apply them to modern forest management goals. This paper is especially useful to those looking for information about social forestry and forest history.

Kuypers, M. (1995). "A marketing Strategy for wildland fuel reduction in Palm Coast, Florida." Unpublished applied research project submitted to the National Fire Academy: Executive Officer Program

In this project, Mr. Kuypers conducted a survey of landowners (both resident and absentee) in Palm Coast, Florida, a planned residential community. The survey was conducted in order to determine an effective marketing strategy for fuel reduction in the area. Kuypers identified three major classes of landowners—those living on the land, those living elsewhere (often with undeveloped property) and ITT Community Development Corporation (ITT CDC), which owns at least 99 lots in the community. The survey covered subject areas such as fuel reduction method (mechanical, thinning, and prescribed burning) and willingness to pay for each method, as well as landowner knowledge about the risk of various natural disasters. At the end of the article, Kuypers proposes a strategy for marketing of fuel reduction plans to Palm Coast landowners.

Laessle, A. M. (1958). "The origin and successional relationship of sandhill vegetation and sand-pine scrub " Ecological Monographs **28**(4): 361-87.

This paper examines the relationship between sand-pine scrub and sandhill vegetation (longleaf pine and turkey oak). The authors suggest that the soils that are well washed and sorted support scrub communities, while the other well-drained deposits that are less severely washed and sorted support sandhill vegetation. They also suggest that there is

not a successional relationship between the two communities. The authors note that in the absence of fire, both of these communities would shift to a hammock, or evergreen hardwood ecosystem.

Lemon, P. C. (1949). "Successional Responses of herbs in the longleaf-slash pine forest after fire." Ecology **30**(2): 135-144.

This article reports on a project begun in 1940 that investigated grazing on coastal plain forest range. Specifically, it looked at changes in herbaceous understory following fire. The experiment was conducted at Alapha, Georgia, on pine flatwoods with and understory consisting primarily of pineland threeawn and Curtiss dropseed. In addition to lists of species, the author provides groupings of plant species, divided into primary herbs, secondary herbs, and fire-followers, and discusses the effects of burning on each group. The article suggests that prescribed burning can be beneficial to grazing and to species diversity and forest health if done in a deliberate manner.

Lewis, C. E. (1970). "Responses to chopping and rock phosphates on south Florida ranges." Journal Of Range Management **23**: 276-282.

In response to the problems of brush accumulation and low-quality forage on pine wiregrass lands in Florida and Georgia, this paper considers the effects of roller chopping and rock phosphate application in addressing the problems. The authors conclude that both chopping and rock phosphate application can improve grazing values on these lands. What might be useful to fire managers in this article, though, are the descriptions both of original and after treatment groundcover in terms of species and density, especially the saw palmetto, a problematic species to many managing Florida lands.

Lewis, C. E. (1980). "Rock phosphate, chopping, and fire benefit forage and trees in south Florida. ." Florida Cattleman(44): 28-29.

This paper describes a study conducted in Charlotte County, Florida in the 1960's, where rock phosphate was applied to chopped and unchopped pine flatwoods, with the aims of increasing rangeland productivity. The paper describes briefly effects on individual and species health as well as changes in species diversity in the study plots, including effects on undesirable species such as pineland threeawn. The authors conclude by suggesting that "the use of rock phosphate and fire may well be a desirable intermediate step in forage management."

Lewis, C. E., George W. Tanner and W. Stephen Terry (1988). "Plant responses to pine management and deferred-rotation grazing in north Florida." Journal Of Range Management **41**(6): 460-465.

This study examined responses of herbaceous and woody plants to combinations of plant and grazing management systems on the Austin Cary Memorial Forest in Alachua County, Florida. Researchers observed growth responses of both herbaceous ground cover and pine growth. While specific responses are listed and discussed in the paper, generally results suggested that neither burning, clearcutting, site preparing, nor grazing significantly affected species composition in a lasting manner. The important general conclusion of the study is that cattle and pine can be managed simultaneously without major impact on each other.

Liu, H., E. S. Menges, et al. (2005). "Effects of fire intensity on vital rates of an endemic herb of the Florida Keys, USA." Natural Areas Journal **25**(1): 71-76.

Fire intensity is an important aspect of population dynamics and fire-dependent community composition. This study investigated the effects of fire intensity on the population of *Chamaecrista keyensis*, or Big Pine partridge pea, in the endangered pine rocklands of the Florida Keys. Results of the study suggested that fire intensity effects can be seen in reproduction of Big Pine partridge peas in the first year after fire, but not in survival, growth, or seedling recruitment. The authors suggest that extremely low fire intensity may not provide sufficient stimulus for adequate reproduction of *C. keyensis*.

Lloyd, F. T., Waldrop, Thomas A., and David L. White (1995). "Fire and fertilizer as alternatives to hand thinning in a natural stand of precommercial-sized loblolly pine." Southern Journal of Applied Forestry **19**(1): 5-9.

In this paper, the authors consider advantages and disadvantages of three treatments aimed at increasing the quality of loblolly pines: hand thinning, prescribed burning, and fertilizer application. Their research showed that both hand thinning and prescribed burning thinned and thus increased periodic growth of remaining crop trees in the sample plots. However, only hand thinning initially increased height growth. Nitrogen fertilization increased growth both of dbh (diameter at breast height) and height, but did not thin the stands. The authors suggest that while prescribed burning is a promising option, that guidelines for prescribed burning in young stands do not yet exist and more research in the area is needed. Results like those presented in this paper also suggest the possibilities for further study of combined treatment regimes.

Lloyd, F. T. and T. A. Waldrop (1997). Low Cost Forest Operation Systems for Mixed Species Management. Ninth Biennial Southern Silvicultural Research Conference, Clemson, South Carolina, U.S. Department of Agriculture, Southern Research Station.

The authors of this paper address the problems encountered when the low quality of trees on NIPF (non industrial private forest) lands leads to a harvest of high quality trees that eventually leads to a high percentage of low quality trees on the land. The other option exercised by many NIPF landowners, the pine plantation, has its own disadvantages, so this paper proposes another alternative management option. Mixed hardwood and southern yellow pine stands are already found on much Piedmont forest land, and those stands can be managed effectively with some guidance, offered in this paper. The authors illustrate the lower cost and higher site quality resulting from such an operation, and discuss the various management options including seasonal burning, and the felling of residual hardwood stems.

Long, A. J. (2002). Benefits of prescribed burning. School of Forest Resources and Conservation, Florida Cooperative Extension Service, University of Florida Extension: Institute of Food and Agricultural Sciences

Long creates a broad picture of prescribed burning in this article. He discusses reasons for prescribed burning and some concerns about the method. This would be a good introduction to citizens who may know very little or nothing about prescribed burning,

but would probably cover only basic concepts that those in the realm of fire management already know.

Long, A. J. (2002). Prescribed burning regulations in Florida. School of Forest Resources and Conservation, Florida Cooperative Extension Service, University of Florida Extension: Institute of Food and Agricultural Sciences.

In this article, Long gives an overview of the rules governing prescribed burning in Florida. He offers a brief history of fire regulations in the state and discusses recent and active laws about prescribed burning. The article also suggests the steps required, legally before performing a prescribed burn.

Loomis, J., L. S. Bair, et al. (2000). A survey of Florida residents regarding three alternative fuel treatment programs., Colorado State University, in cooperation with the Survey Research Center, University of Georgia.

This extensive survey project queried a range of people in several different Florida communities regarding their knowledge of fire and forest management techniques. Building on several previous studies, the authors made sure to query both Spanish-speaking and English-speaking residents, as well as people both close to and distant from an area recently affected by severe wildfires. Very generally, the authors concluded that in all groups, the greater the knowledge people had about prescribed burning and other fuel treatment methods, the more likely they were to support those methods. Specific statistical data are offered for individual treatments (prescribed fire, herbicide, mechanical fuel reduction) as well as demographic and belief information about the different survey cohorts. This paper is an important read for those working with fire management in Florida.

Loomis, J., A. Gonzalez-Caban, et al. (2004). "Multicultural Evaluation of the Performance of Contingent Valuation for Forest Fire Prevention." Contemporary Economic Policy **22**(3): 407-419.

This article describes a survey conducted to investigate the ability of the Contingent Valuation Method (CVM) to measure willingness to pay (WTP) for a program like President Bush's Healthy Forest Initiative by residents of California. Specifically the project asked whether there were differences in WTP between whites, African Americans, and Hispanics in the area. The project also investigated differing response rates between Hispanics surveyed in Spanish. The results of the study do suggest statistical differences in survey response rates between groups, and similarities across all respondent groups in regards to WTP or unwillingness to pay. The authors suggest that the dichotomous-choice CVM appears well-suited for evaluating effects on African Americans and whites in California, and that forest fire prevention using prescribed burning does appear to have substantial support across the four sampled ethnic groups in California.

Loomis, J. B. B., Lucas S.; Gonzalez-Caban, Armando (2001). "Prescribed Fire and Public Support: Knowledge Gained, Attitudes Changed in Florida." Journal of Forestry **99**(11): 18-22.  
Curious about the effects of educational campaigns on residents' beliefs about wildfire,

these researchers conducted a survey that included two phases of questioning regarding wildfire knowledge. In the approximately two-week period between phases, they sent participants an educational handbook. They hypothesized that the educational campaign would change the attitudes and knowledge of Florida residents, and their results supported that hypothesis. They did note, however, that a longitudinal study would be necessary to discover how long these changes in knowledge and attitude would last.

Lunsford, J. (1987). "Prescribed fire in the Southeast-five steps to a successful burn." Fire Management Notes **48**(3): 30-35.

This instructional article walks the reader through all of the preparation needed for a prescribed fire, each of the steps involved in burning such a fire, and what needs to be done for follow-up on prescribed burns. Lunsford defines terms, describes tools and methods, and also explains the historical background of contemporary fire policy. This is a useful quick background read for fire managers, though not current enough to be depended on alone for management decisions. The article is specific to Southeast ecosystems but its general principles could be applied in other areas.

Main, M. B. and L. W. Richardson (2002). "Response of wildlife to prescribed fire in southwest Florida pine flatwoods." Wildlife Society Bulletin **30**(1): 213-221.

We conducted an experiment using infrared-triggered camera traps to document relative abundance of wildlife in pine flatwoods habitat at different stages of post-fire recovery at the Florida Panther National Wildlife Refuge in southwest Florida. Total wildlife, which for the purposes of this study was defined as records of wild turkey (*Meleagris gallopavo*) and all mammals captured on film, used pine flatwoods habitat in a fire management unit (FMU) with a post-fire recovery history of 24 months significantly more than adjacent pine flatwoods in an FMU with a post-fire recovery history of 48 months ( $P = 0.04$ ). Data suggested that the relative abundance of white-tailed deer (*Odocoileus virginianus*) was also higher in the 24-month post-fire FMU ( $P = 0.12$ ) compared to the 48-month FMU. To evaluate response of wildlife to prescribed fire, we burned the 48-month FMU and, after approximately 8 weeks, repeated the camera-trap surveys in the newly burned (<6-month) FMU and the adjacent FMU, now at approximately 30-months post-fire recovery. We documented a significant increase in use of the recently burned (<6-month) FMU compared to previous levels of use (48-month FMU) by total wildlife ( $P = 0.04$ ) and white-tailed deer ( $P = 0.02$ ). Use of the <6-month FMU by wild turkey also appeared to increase ( $P = 0.13$ ). No difference was detected between the <6-month and the adjacent 30-month FMU in use by total wildlife ( $P = 0.52$ ), white-tailed deer ( $P = 0.43$ ), Florida panther ( $P=0.23$ ), or wild turkey ( $P = 0.14$ ), although data suggested that wild turkey may have preferred the newly burned area. More importantly, our data suggested that wildlife did not avoid pine flatwoods habitat at up to 30-month post-fire recovery. Wildlife use of pine flatwoods habitat, therefore, was observed to increase in areas recently burned (<6 months post-fire), was similar between FMUs with post-fire recovery of <6 and up to 30 months, and was lowest in habitat that had not been burned for 48 months. Maintaining a prescribed-fire rotation of less than or equal to 48 months, therefore, appears to improve habitat quality of pine flatwoods for white-tailed deer, wild turkey, and other wildlife in southwest Florida.

Main, M. B. and G. W. Tanner (2003). Effects of fire in Florida's wildlife and wildlife habitat, University of Florida Extension: Institute of Food and Agricultural Sciences.

The authors of this paper attempt to contradict negative stereotypes about the potential negative effects of fire on wildlife in Florida. They emphasize the temporary nature of changes brought by fire and remind readers that both individual species and entire ecosystems in Florida depend on fire to complete their life cycles.

Manfredo, M. J., M. Fishbein, et al. (1990). "Attitudes toward prescribed fire policies: The public is widely divided in its support." Journal of Forestry **88**(7): 19-23.

In response to the wildfires of the summer of 1998, these researchers polled members of the public--both those affected by the Yellowstone fires and residents of other regions--about fire knowledge and acceptance of prescribed fire treatments. They found a slightly positive response from residents of Montana and Wyoming, and an evenly divided national response between those who did and did not support prescribed burning. This paper, like many others in this collection, suggests that in addition to biological and statistical support for prescribed fires, another important aspect of forest management policies is public education and communication.

Martin, G. G. (1988). "Fuels treatment assessment--1985 fire season in Region 8." Fire Management Notes **49**(4): 21-24.

This report describes a fuel treatment assessment that considered fuel treatment and wildfire intensity, size, suppression cost, and damage in the USDA's region 8 in 1985. Despite similar numbers of wildfires burning on land that had been previously prescribed-burned and land that had not, percentage of acreage burned was much greater on lands that had not been prescribed burned (52% as compared to 16% in prescribed-burned areas). This difference is most pronounced in large wildfires. It is also noted that for every \$1.00 expended for fuels treatment prescribed burning, \$1.76 was saved in suppression and damage costs. The author advocates for more widespread use of prescribed burning.

Mason, C. L., B. R. Lippke, et al. (2006). "Investments in fuel removals to avoid forest fires result in substantial benefits." Journal of Forestry **104**(1): 27-31.

This economic analysis of fuel reduction techniques argues that, like many other environmental problems, if the complete costs of severe wildfires were known, we would more willingly support fuel reduction measures. Specific dollar amounts are estimated regarding treatment benefits as well as potential financial costs that would accompany the failure to treat these fuels.

Masters, R. E., R. L. Lochmiller, et al. (1998). "Small mammal response to pine-grassland restoration for red-cockaded woodpeckers." Wildlife Society Bulletin **26**(1): 148-158.

This project considered how an ecosystem approach to habitat improvement (wildlife stand improvement and prescribed burning) for the red-cockaded woodpecker affected small mammals. This was conducted at the Ouachita National Forest in Arkansas, though the results hope to guide similar work across the southeast. Results suggested that no species was negatively impacted by wildlife stand improvement or by fire, and in fact may enhance small mammal communities by restoring a more diverse landscape that

existed prior to settlement.

McInnis, L. M., B. P. Oswald, et al. (2004). "Growth response of *Pinus taeda* L. to herbicide, prescribed fire, and fertilizer." Forest Ecology And Management **199**(2-3): 231-242.

In this study, researchers set out to determine the relative effects of combinations of herbicide, fire, and fertilizer treatments on the growth of loblolly pine on two sites in Texas. Though these researchers seemed to be interested in increasing growth, this study could be useful to fire managers as they could use the results to predict what might be the most—and least—effective means of fuel reduction using each of these techniques. Generally, they found that herbicide use increased the growth of loblolly pine, that fire had no positive growth effect and some negative effect due to crown scorch, and that fertilizer increased tree growth.

McMahon, C. K., D. J. Tomczak, et al. (1997). Longleaf pine ecosystem restoration: the role of the USDA Forest Service. Longleaf pine ecosystem restoration symposium; Society of Ecological Restoration, 9th annual international conference, Fort Lauderdale, FL, Longleaf Alliance.

This report examines the ways in which the USDA Forest Service was contributing (in 1998) to efforts of restoration and conservation of the longleaf pine ecosystem in the area covered by the USFS Southern Research Station. It details three main roles that the USFS plays in relation to this effort: Land and natural resource management, outreach and partnership, and research. The end of the report includes specific projects being funded and pursued within the USFS Southern Research Station that contribute to increased knowledge about and protection longleaf pines and their ecosystems. It also includes maps and charts that identify all areas in USFS land that contain significant stands of longleaf pine.

McMinn, J. W. (1967). Comparative fire resistance of two seed sources of south Florida slash pine. Asheville, NC, USDA Forest Service Southern Experiment Station.

McNab, W. H. (1977). "An overcrowded loblolly pine stand thinned with fire." Southern Journal of Applied Forestry **1**(1): 24-26.

This thinning fire in the piedmont of central Georgia was successful in reducing the stems per acre by two thirds. It was also successful in that it supported earlier claims that trees with a bark thicker than .7 inches would not die in a thinning fire. The author warns that while this fire was successful in thinning the stand but not killing crop trees, there are many variables that could change that outcome. He suggests that a stand have a wide range of stem sizes for successful thinning with fire, and that managers pay close attention to weather conditions so that they can light such fires when fuel moisture is higher than usual, and he suggests a low-intensity backfire.

Menges, E. S. and M. A. Deyrup (2001). "Postfire survival in south Florida slash pine: interacting effects of fire intensity, fire season, vegetation, burn size and bark beetles." International Journal of Wildland Fire **10**: 53-63.

This study used path analysis to examine postfire survival in the Archbold Biological Station of south Florida slash pines. The authors considered bark beetle infestation, fire

intensity, season of burn, burn size, and vegetation structure and composition as a combination of factors. They suggest that fire-induced mortality did not spread to neighboring stands, that fire intensity affects tree density on some sites, and that height of char is a good predictor of tree mortality. The authors also offer advice on ways to manage fires for pine survival.

Mercer, D. E. and J. P. Prestemon (2005). "Comparing production function models for wildfire risk analysis in the wildland-urban interface." Forest Policy and Economics 7(5): 782-795.

This project investigates the relationship between socio-economic variables and wildland fire management by examining human roles in fire events. The authors outline wildfire production functions (parametric relationships between wildfire output and a set of inputs) including fire events, fire aggregate extents, and combinations of the two. Among their findings, the authors noted that lower unemployment and housing density are consistently associated with statistically significant lower risks of ignition and extent of fire, and that past occurrence of wildfire also reduces intensity of future wildfires. Increased population had a positive impact on the risk of ignition, and higher poverty rates decreased probability of ignition, though fires that were ignited tended to be larger and more intense. This study emphasizes the importance of considering socioeconomic variables along with ecological and climate variables.

Miller, C. and D. L. Urban (2000). "Connectivity of forest fuels and surface fire regimes." Landscape Ecology 15(2): 145-154.

This paper investigates the effects of fire suppression on fuels connectivity in Sierran forests. The researchers developed a model to simulate interactions among fire, climate, and forest pattern in Sierra Nevada forests. Generally, they found that fire frequency influences connectivity of burnable area, that elevation affects variables like fuel moisture and fuel loading as well as bulk density, and most importantly that fire frequency can affect the connectivity of burnable area. Thus, fire suppression leads to increased connectivity and possibly wider spreading fires.

Miller, J. H. (1994). Pine Growth and Plant Community Response to Chemical vs. Mechanical Site Preparation for Establishing Loblolly and Slash Pine. Eighth Biennial Southern Silvicultural Research Conference, Auburn, Alabama, U.S. Department of Agriculture, Southern Research Station.

In this study, researchers investigated the use of various pretreatments for new commercial pine stands. The experimental area is in Southern Alabama, and measurements of trees and fuels were taken before treatment, and at 1, 2, and 5 years after treatment. While this research was conducted with an eye toward the establishment of loblolly and slash pine stands, it is useful to those studying forest fuel reduction in that the researchers record the amounts of growth resulting from each type of treatment. Treatments used include mechanical treatments like disking and using feller-bunchers and herbicide application. For establishing growth on conventional harvesting sites, the authors conclude that chemical and mechanical treatments were equally effective. This detailed, extensive research report will be useful to fire managers both in introducing vocabulary and treatment techniques and in demonstrating the growth consequences of each individual manner of treatment.

Miller, S. R. and D. Wade (2003). "Re-introducing fire at the urban/wild-land interface: planning for success." Forestry 76(2): 253-260.

This paper briefly describes a single planned prescribed burn at the Moses Creek Conservation area Florida. While the descriptions of the particular burn and preparations are useful, the authors emphasize also the importance of cooperation between agencies, neighborhood community education executed well before the burn is planned and careful preparation for all possible outcomes for prescribed burn.

Mobley, H. E. (1974). "Fire--its impact on the environment." Journal of Forestry 72(7): 414-417.

Mobley introduces and discusses prescribed fire in the South, showing its advantages over wildfires in a list of comparisons. He considers the difference in the two kinds of fire in regards to effects on timber, water, soil, wildlife, range, scenic beauty, and air quality, arguing for the advantages of prescribed burning in each case. He also considers specific air pollutants resulting from each kind of fire. Mobley seems ahead of his time when he says, at the end of the article, that "fire is not a respecter of property lines" and that fire is not a state or regional problem, but a nationwide one blind to political boundaries.

Mobley, H. E. J., Robert E.; Balmer, William E.; Ruziska, Wayne E.; Hough, Walter A. (1977). A guide for prescribed fire in southern forests. Atlanta, U.S. Dept. of Agriculture, Forest Service, Southeastern Area.

This extensive, if outdated, guidebook attempts to describe the history, context, and current practices of prescribed burning in the South. A detailed table of contents guides readers to desired topics, and the guide is also useful if read straight through. Despite the age of this text, due to the large amount of information it contains specific to the south, it would be a useful read for those just learning how to conduct burns, someone outside of the profession who wanted a detailed overview of prescribed burning, or those attempting to create an historical framework for the ways in which the technique is used now.

Monk, C. D. (1968). "Successional and environmental relationships of the forest vegetation of north central Florida

" American Midland Naturalist 79(2): 441-457.

In this early study of succession in North Central Florida ecosystems, Carl Monk first identifies seven major forest vegetation types, which are related but not identical to terms we use today. He discusses the various contributing factors that describe a vegetation type, including geology, soil types, drainage, topography, and other environmental qualities. He also enters into a discussion about individualistic and hierarchical approaches to describing relationships between vegetation types, or ecosystems. This is an interesting article in the study of historical forest research, but readers should keep the date of publication in mind in using this paper for current research.

Monroe, M. C. (1999). Where there's fire, there's smoke: Air quality and prescribed burning in Florida. School of Forest Resources and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

This paper first introduces data about air quality in Florida, and about the different types

and sizes of particulate matter that pollute the air and cause a threat to human health. She then makes recommendations about prescribed burning based on this information and Florida's Smoke Management Plan (SMP). Her recommendations include reduced fuel loads, optimal weather conditions for burning, and timely notification of affected parties and local news agencies.

Monroe, M. C. (2000). *Wildland Fire Education Handbook*, School of Forest Resources and Conservation, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

This very accessible handbook provides a wide variety of public relations tools to managers of Florida's fire-prone areas. The handbook is divided into the following chapters: 1: Introductions; 2: Publications on Wildland Fire; 3: Audio-visual resources; 4: Press Kit for Wildland Fire; 5: Wildland Fire Demonstration areas; 6: Reporting Wildland Fire activities; and 7: Wildland Fire Appendices and Acknowledgements. This handbook would be especially useful for managers just beginning to work on public education about wildland fires and prescribed burning, as it provides templates, photos, and even outlines steps one would take to keep the media and public up-to-date on prescribed burning activities.

Monroe, M. C. L., A. J.; Marynowski, S. (2003). "Wildland Fire in the Southeast: Negotiating Guidelines for Defensible Space." *Journal of Forestry* **101**(3): 14-19.

After the 1998 wildfires in Florida, forest managers and other officials noted that most available information about protecting the wildland-urban interface was specific to the west or aimed at the whole nation. They began to consider the ways in which these regulations did and did not fit with the societal and biological features of Florida. In the process, they also discovered conflicting messages being sent to homeowners via fire managers, landscape artists, and other professionals in the community. In attempts to follow a 1998 memorandum from then-president Bill Clinton that promoted alternative dispute resolution, representatives from a wide range of agencies and organizations gathered for a one-day workshop to discuss recommendations for landscaping in areas prone to wildland fire. This paper discusses both those recommendations and what it takes to achieve a results-oriented and successful meeting of such a wide range of views, and would be helpful both to those interested in Florida wildland-urban interface issues and those interested in collaborative policy making.

Moore, W. H., B. F. Swindel, et al. (1982). "Vegetative Response To Prescribed Fire In A North Florida Flatwoods Forest." *Journal Of Range Management* **35**(3): 386-389.

In this early study of the effects of prescribed fire on vegetation, researchers found increased herbaceous species frequency. The research was performed at the University of Florida's Austin Cary Memorial Forest, and the prescribed burn occurred during the winter of 1975-76. Specific sections described changes in woody plant coverage, changes in herbaceous species frequencies, and changes in herbage biomass. This paper is also useful for the extensive species list it provides to readers unfamiliar with the terrain.

Moorehead, D. J. a. C. W. D., Jr. (1990). The value of site preparation prescriptions: an economic analysis. Sixth Biennial Southern Silvicultural Research Conference, Memphis, TN.

Myers, R. L. and D. L. White (1987 ). "Landscape history and changes in sandhill vegetation in north-central and south-central Florida." Bulletin of the Torrey Botanical Club **114**(1): 21-32.

This study continues at a plot established by Laessle in 1951 in north-central Florida and the Archbold Biological Station in south-central Florida. The authors describe the characteristics of southern ridge sandhill communities, and conduct an inquiry into the invasion at the southern site by xeric hardwoods that did not occur at the northern site. The authors suggest that these differences may derive from fire history and amount of human alteration, as well as other climatic and biogeographical factors.

Omi, P. N. and E. J. Martinson (2002). Effects of fuels treatments on wildfire severity, Western Forest Research Center, Colorado State University.

This broad study considers the effects of various fuel treatments on lands where large fires occurred after the areas had been treated. Experimental plots were selected in California, Colorado, Arizona, and Mississippi. In particular, researchers wanted to look at both treated and untreated plots within the area of one fire to compare differences in effect with fewer variables interfering. The authors note that the strongest correlation in terms of crown fire hazard was a negative correlation between height to live crown and stand damage. They also observe that variables that determine tree resistance to fire damage are especially crucial to determining fire outcomes. Finally, the authors warn that fuel treatment may be less effective in areas where fires have been historically less frequent and more severe. This study is useful because of its geographical broad range and the solid support it offers for fuel treatment and reduction strategies.

Outcalt, K. W. (2000). Occurrence of fire in longleaf pine stands in the southeastern United States. Fire and forest ecology: innovative silviculture and vegetation management, Tallahassee, Florida, Tall Timbers Research Station.

Outcalt considers a subsample of longleaf pine plots in Georgia, Florida, and South Carolina to assess the percentage that had been burned in the past five years. Generally, he found that prescribed fire was used more on public than private land, and more on larger than smaller stands. Noting the strong correlation between prescribed burning and healthy understory ecosystems, Outcalt suggests that prescribed burning is of equal importance on smaller and privately owned plots, though he predicts that rates of burning on those lands will continue to lag behind rates of burning on public lands.

Outcalt, K. W. and J. L. Foltz (2004). Impacts of growing-season prescribed burns in the Florida pine flatwoods type. . 12th biennial southern silvicultural research conference, U.S. Department of Agriculture, Forest Service, Southern Research Station.

This project investigated the effects of growing-season burns in pine flatwoods stands in south Florida. Researchers used a three block, five treatment design, using blocks that contained the various conditions representative of the area. The authors concluded that growing-season prescribed burns were at least as effective in reducing fuel loads as similar burns conducted during the dormant season, and they suggest that growing-season burns could be more effective in reducing live woody fuels and increasing herbaceous components. Tree mortality was not significantly increased by burning during the growing season, and they expected no measurable growth loss due to these types of

burns.

Outcalt, K. W. and C. H. Greenberg (1998). A Stand-Replacement Prescribed Burn in Sand Pine Scrub. 20th Tall Timbers Fire Ecology Conference, Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription, Tallahassee, FL, Tall Timbers Research Station.

This paper describes the characteristics and results of a high-intensity prescribed burn on a stand of Ocala sand pine scrub. This ecosystem, often managed for pulpwood and frequently near areas of high population, rarely burns. However, the authors suggest that high-intensity prescribed burns are necessary for regeneration and fire-dependent species, and that such prescribed burns can be managed successfully to achieve both ecological and public goals (for example, regeneration as well as smoke management). Specific information about the burn and its effects on the area is offered within the report .

Outcalt, K. W. and D. Wade (2004). "Fuels management reduces tree mortality from wildfires in Southeastern United States." Southern Journal of Applied Forestry **28**(1): 28-34.

The authors of this study asked what the optimal prescribed burning program would be for reducing tree mortality from wildfires in southern pine forests. They sampled a wide range of sites, including public and private lands, natural and planted stands, areas that had never been burned with prescription fires, and stands that had been burned at varying temporal distance from the time of wildfire. Generally, they found that trees that had been treated with prescribed fire 1.5 years before a wildfire hit were most likely to survive. Data were similar for trees in natural and planted stands.

Platt, W. J. and R. M. Gottschalk (2001). "Effects of exotic grasses on potential fire fuel loads in the groundcover of south Florida slash pine savannas." International Journal of Wildland Fire **10**(2): 155-159.

Platt and Gottschalk note that while the hypothesis that invasive exotic grasses increase fine fuel loads has been tested, studies have not been conducted in fire-prone areas. In this project, then, they examine the effects of *Imperata cylindrica* and *Neyraudia renaudiana* in south Florida slash pine savannas. Because invasive grasses both increase biomass and push out other native species, the authors suggest that invasive grasses can in fact affect fire characteristics in fire-prone ecosystems.

Prestemon, J., D. E. Mercer, et al. (2001). Economically optimal wildfire intervention regimes. American Agricultural Economics Association Annual Meeting, Chicago, IL, American Agricultural Economics Association.

In order to look at wildfire and wildfire prevention measures in a quantifiable manner, the authors have performed a maximization function that considers wildfire and public welfare. Using a small sample area in Florida, Volusia County, they perform an analysis of the economic costs and benefits of using prescribed fire to prevent wildfire, and conclude that the annual amount of prescribed burning is at a nearly optimal rate, and significant increases would not reduce catastrophic wildfire in the area. Since many land managers support prescribed fire, it would be useful for them to be familiar with papers like this that suggest it has reached its maximum benefit.

Rebertus, A. J., G. B. Williamson, et al. (1989). "Longleaf pine pyrogenicity and turkey oak

mortality in Florida xeric sandhills." Ecology 70(1): 60-70.

This paper considers the relationship between turkey oak and longleaf pine survival after experimental fires. There is a complex relationship between fire return interval, density and intermingling of the two species, and other factors. The authors conclude that reduced oak competition could increase the fitness of longleaf pines, but that irregular fires might lead to increasingly fit turkey oaks.

Sah, J. P., M. S. Ross, et al. (2004). "Estimating aboveground biomass of broadleaved woody plants in the understory of Florida Keys pine forests." Forest Ecology and Management 203: 319-329.

The authors of this study developed equations to estimate aboveground biomass and fine fuel of common hardwood species in the lower Florida Keys (The National Key Deer Wildlife Refuge), in part because of the time and expense required for direct harvesting techniques used to estimate biomass. Generally, total biomass increased with time since the last fire. The study resulted in both species-specific and mixed-species equations, where the equations for particular species were generally more accurate.

Schwartz, M. W. (1994). "Natural distribution and abundance of forest species and communities in northern Florida." Ecology 75(3): 687-705.

This project investigated the "presettlement" plant populations in northern Florida, as summarized from Public Land Survey records collected between 1822 and 1854. This report compares that data to another estimate of vegetative cover, published in 1914. The data suggest that the areas are heavily dominated either by pine or by upland hardwood and forested wetland trees. The report contains detailed summaries of findings, as well as species lists matched up with common names. The authors argue that pine was the dominant cover of northern Florida, and their conclusions are important to ongoing debates about which ecosystems are most fragmented due to commercial pulp production.

Service, U. S. F. a. W. (1999). South Florida multi-species recovery plan. Atlanta, Georgia.

This extensive recovery plan addresses the South Florida ecosystem, which includes the nineteen southernmost counties in Florida. Endangered, threatened, and otherwise noted species are addressed individually, and this report offers a specific, step-by-step plan of action to address each species. At the community level, "restoration objectives" are delineated, which address more than one species at a time. The report addresses categories such as recovery objectives, recovery criteria, actions needed, cost, and estimated date of recovery. Specifically, the report addresses individual ecosystems like pine rocklands and offers valuable species and management information for those ecosystems.

Sire, D. and W. Taylor Effects of hazardous fuels reduction and rehabilitation activities.

The authors considered 2,559 hazardous fuel and fire rehabilitation project records from the US Forest Service and Department of the Interior with the goal of proposing categorical exclusions for these activities from the National Environmental Policy Act (NEPA). They concluded that "the categories of [fuel reduction] actions described will not individually or cumulatively have a significant effect on the human environment," and continued with

their recommendation for categorical exclusions for these activities, though they did establish acreage limitations and monitoring guidance to continue to evaluate projects.

Snyder, J. R., M. S. Ross, et al. (2005). Developing Ecological Criteria for Prescribed Fire in South Florida Pine Rockland Ecosystems, U. S. Geological Survey.

This report discusses experiments conducted at the National Key Deer Refuge in Florida that investigated when and where prescribed burns should occur in order to perpetuate the endangered pine rockland ecosystem. Three treatments, winter burn, summer burn, and no burn (control) were conducted on two understory types: "open" and "shrubby." The experimental burns resulted in different burn intensities and various species responded differently to the seasonal burns. Detailed records of species' responses to the fires are included in this detailed report, and the researchers hope the study will continue into the future.

Spier, L. P. and J. R. Snyder (1998). "Effects of wet- and dry-season fires on *Jacquemontia curtisii*, a South Florida pine forest endemic." Natural Areas Journal **18**(4): 350-357.

This article considers the responses of *Jacquemontia curtisii* to various experimental fires during wet and dry seasons. Dry season burns resulted in more seedlings than wet-season burns and better survival rates. Smaller plants suffered greater mortality after wet-season burns. The authors suggest that a continued regime of varying seasons of prescribed burning to maintain genetically diverse populations.

Stanturf, J. R., Robert; Wimberly, Michael; Rials, Timothy; Araman, Phillip; Busby, Rodney; Granskog, James; Groom, Les (2003). Developing an integrated system for mechanical reduction of fuel loads at the wildland/urban interface in the southern United States. 2nd Forest Engineering Conference. Vaxjo, Sweden, Uppsala Science Park/ Skogforsk.

The authors consider the various models of wildland-urban interfaces and the ways in which those models will influence fuel reduction techniques. They suggest that due to smaller parcel sizes and high move-in costs for large equipment onto those parcels, the model for fuel reduction machinery will move towards smaller, multi-purpose machines. They also advocate careful attention both to the particular wildland-urban interface in question and the fuel materials that will need to be disposed of or sold.

Stephens, S. L. and L. W. Ruth (2005). "Federal forest-fire policy in the United States." Ecological Applications **15**(2): 532-542.

This article reviews and critiques the history of federal forest fire policy in the United States. The authors note that despite increased resources directed toward hazardous fuels reduction, the area burned by wildfire in recent years has continued to increase. They suggest both more detailed reporting of fires from land management agencies as well as a review of current management policy, the results of which may lead to reform in fire prevention and management strategies, which the authors suggest are currently inadequate. This article emphasizes the political and collaborative aspects of fire policy formation, and addresses the difficulties encountered in such approaches to forest management.

Stout, I. J. (2001). "Rare plants of the Florida scrub, USA." Natural Areas Journal **21**(1): 50-59.

This paper considers endangered and rare plant species of the Florida scrub ecosystem. These consist primarily of taxa from perennial, woody habitats, with long life spans that are habitat specialists. The article addresses many of these species individually, and suggests that areas with more frequent fire return intervals are more likely to support populations of these rare plants. The author warns of the careful intensive management and scrub ecosystem conservation that will be required to maintain these populations in the future.

Tanner, G. W., Wood, John M.; Kalmbacher, Robert S. and Frank G. Martin (1988). "Mechanical shrub control on flatwoods range in south Florida." Journal Of Range Management **41**(3): 245-248.

This article compares two types of mechanical shrub control on South Florida ranges: roller-chopping and web plowing. Overall, the web plowing proved more effective in reducing saw-palmetto and other herbaceous species, probably because roller chopping usually covers each area twice as compared to once in this study, and because roller choppers are less effective on dry, hard surfaces. The authors also note that smaller woody plant species are not effectively controlled by these mechanical methods.

Varner, J. M. and J. S. Kush (2004). "Remnant old-growth longleaf pine (*Pinus palustris* Mill.) Savannas and forests of the southeastern USA: Status and threats." Natural Areas Journal **24**(2): 141-149.

Noting a lack of comprehensive inventories of old growth communities of longleaf pine, these researchers surveyed the southeast via personal contacts, library research, and field visits in search of old growth stands. Their results suggest approximately 5095 acres of old-growth longleaf pinelands remain. This article lists and describes some of those stands, then summarizes threats and possibilities for additions to such areas.

Vose, J. M. and W. T. Swank (1993). "Site Preparation Burning to Improve Southern Appalachian Pine Hardwood Stands - Aboveground Biomass, Forest Floor Mass, and Nitrogen and Carbon Pools." Canadian Journal of Forest Research-Revue Canadienne De Recherche Forestiere **23**(10): 2255-2262.

In this study, the authors investigated the changes in biomass, nitrogen, and carbon following prescribed burning on three sites in the southern Appalachian Mountains. This research was performed in order to discover how site preparation burning at mixed pine hardwoods in the area impacts nutrient cycling, productivity, and vegetation diversity. While the burning treatment is successful in reducing slash and preparing an area for planting, many of those sites became infertile, with extremely low aboveground and forest floor Nitrogen, suggesting a need for caution in creating long-term management plans that include prescribed burning of slash.

Wade, D. D. (1989). High-intensity prescribed fire to maintain spartina marsh at the urban-wildland interface. 17th Tall Timbers Fire Ecology Conference: High Intensity Fire in Wildlands: Management Challenges and Options. Tallahassee, FL, Tall Timbers Research Station.

In this article, Dale Wade recounts a somewhat unusual opportunity for prescribed burning on Sanibel Island, Florida, an upscale island resort. Following a destructive

wildfire in 1971, and debates as to what the best management practice would be to reduce such risks in the future, the Sanibel-Captiva Conservation Foundation approached the U.S. Forest Service about assistance with a prescribed burn. After careful planning and extensive public education campaigns, the burn was executed successfully, reducing the dangerously high level of fuels in a marsh area. Several years later, when the Sanibel-Captiva Conservation Foundation built a museum structure immediately adjacent to the fuel-heavy area, another successful burn was conducted in front of visitors, leading to a permanent walk-through educational experience where visitors can see the island's ecosystems in various stages of regeneration following fire.

Wade, D. D. a. L., J. (1990). "Fire as a forest management tool: prescribed burning in the southern United States." Unasilva(162): 28-38.

This article describes the need for and process of prescribed burning as a forest management tool in the United States. The authors explain the effects of fire on various environmental factors like air, water, and soil quality. They also describe in detail various methods of prescribed burning: backing, flanking, point source fires, and others. This is a good source of information for those new to prescribed burning, though it is not as up-to-date as some other articles.

Wade, D. D. a. M. C. L. (1979). "New Legislation Aids Hazard-Reduction Burning in Florida." Journal of Forestry 77(11): 725-726.

This brief article updates readers on the passage of the Hawkins Bill in Florida, a bill that addresses prescribed burning on absentee-owned lands in Collier County, Florida. The bill allows the division of forestry to conduct prescribed burns on any wildlands where heavy understory buildups created the potential of a destructive fire. At the time this article was written, approximately 13,000 acres had been burned under the criteria of the bill, with an overwhelmingly positive response from the public.

Waldrop, T. A. a. V. L., David H. (1984). "Effect of Crown Scorch on Survival And Growth of Young Loblolly Pine." Southern Journal of Applied Forestry 8(1): 35-40.

This project investigated the relationship between crown scorch (measured by comparing rates of needle drop) to tree mortality in fires of varying intensities. The researchers found that fires of medium intensity in young, unthinned loblolly pine stands increased needle drop and crown scorch. They also determined that some scorch is not detrimental to tree survival, unless crown scorch approaches 100% on a tree. For fire managers, this indicates the relative safety of low-to medium-intensity fires in relation to crown scorch and thus tree survival.

Waldrop, T. A. L., Thomas (1988). "Precommercial Thinning a Sapling-Sized Loblolly Pine Stand with Fire." Southern Journal of Applied Forestry 12(3): 203-207.

This study compared prescribed burning to other types of precommercial thinning. In their conclusion, the authors note that the burning effectively thinned a young loblolly pine at a lower cost than most other methods, but that it did not reach the goal of 1600 stems per acre. Details are given about tree mortality, crown damage, and stocking data. The article is fairly short, and the authors suggest further research in the area.

Ward, D. E. (1983). "Particulate Matter Emissions For Fires In The Palmetto-Gallberry Fuel Type." Forest Science 29(4): 761-770.

. Here, particulate matter emissions from prescribed burns are considered in the specific locale of the Palmetto-Gallberry ecosystems of Georgia and Florida. Ward notes the connections between flame length, heat release, and particulate matter, and demonstrates equations that, combined with data specific to the fire and area, can predict emissions for a given fire. Ward also describes the situations in which certain predicted emissions could change a fire prescription.

Watts, W. A., B. C. S. Hansen, et al. (1992). "Camel Lake - A 40000-Yr Record Of Vegetational And Forest History From Northwest Florida." Ecology 73(3): 1056-1066.

This paper investigates the vegetational history of Camel Lake in northwest Florida for more than 40,000 years, investigating further E. S. Deevey's ideas about areas of refuge for temperate trees during periods of glaciation. Especially of interest to the authors is the diversity of vegetation in the Mid Wisconsin period, suggesting the historical record of climactic change in the area. Also provided are lists of species that existed in the area in each historical and climactic period

Williamson, G. B. a. E. M. B. (1981). "High temperatures of forest fires under pines: a selective advantage over oaks." Nature(293): 643-644.

This project measured potential fire-retarding and fire facilitating traits of plants, and also measured maximum temperatures during fires at various heights and under different canopies: live oak, turkey oak, and pine. Results suggest that fire temperatures are influenced by litter deposition patterns and that some tree species may facilitate the agents of destruction which are the targets of control.

Winter, G. J., C. Vogt, et al. (2002). "Fuel treatments at the wildland-urban interface - Common concerns in diverse regions." Journal of Forestry 100(1): 15-21.

The authors of this article conducted surveys of residents in Michigan, Florida, and California in fire-prone areas in hopes to discover more about public opinion and acceptance of fuel management techniques. They summarize that four major factors influence acceptance of management techniques such as prescribed fire, mechanical reduction, and defensible space: beliefs about outcomes, personal importance of fuel management, situational specificity, and agency trust. One of the most important aspects of agency trust is credibility; if citizens don't believe in the expertise of forestry officials they are less likely to accept management practices.

Wright, H. A. and A. W. Bailey (1982). Soil and Water Properties. Fire Ecology: United States and Southern Canada. New York, Wiley-Interscience: 25-47.

This chapter discusses the effects of fire on soil and water. It considers those effects based on fuel type, intensity of burn, soil, climate, and topography. The chapter is divided into subsections that consider organic matter, soil fauna, soil chemistry, mineral elements and availability of nutrients, soil moisture and loss, and runoff. This would be a good resource for those who have fairly extensive knowledge of the different types of wild and

prescribed fires, but would like to know more about the varying effects fire can have on soil and water properties.

Yahr, R. M., Eric S.; Berry, Dawn (2000). "Effects of drainage, fire exclusion, and time-since-fire on endemic cutthroat grass communities in Central Florida." Natural Areas Journal **20**(1): 3-11.

This article considers the effects of natural, periodic fire treatment regimes as compared to altered, or drained and fire excluded treatment regimes on 55 sites dominated by cutthroat grass at Archbold Biological Station in south-central Florida. They found that the majority of sites managed to mimic natural conditions stayed in a cutthroat grass dominated ecosystem, and while a majority of sites managed with fire exclusion shifted to other vegetation types. The results suggest that active management is needed to maintain cutthroat grass vegetation.