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FOR 63

Developing Land in Florida with Fire in Mind: Recommendations for Designers, Developers, and Decision Makers[1]

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Fire in Florida

Florida's valuable natural landscape provides us with clean air and water, a diversity of wildlife, and beautiful surroundings. When building homes and designing neighborhoods in Florida, it is important to protect and enhance as much natural land as possible. Because fire is an essential ingredient in maintaining Florida's natural landscapes, it is critical to design developments that enable prescribed burning of natural areas while protecting the community from wildfire.

In 1998, fire destroyed or damaged 330 homes and businesses in Florida. Losses totaled more than $800 million. In some places, homes were saved by fire-fighting crews, or where the right decisions were made by builders or designers (Figure 1). With advance planning, architects and developers can do a great deal to reduce wildfire risk for those living and working in Florida.

Are You Building in a Fire-Prone Area?

There are several factors that will help you determine if you are building in a fire-prone area: (1) land use in and around your development, and (2) the vegetation of the ecosystem in which you are building. Follow these guidelines to assess your development's risk of fire.

Figure 1. Developments can be designed to help residents live safely with fire in Florida. This home is protected by breaks in the ground-level vegetation between the yard and neighboring undeveloped land.

Assessing Risk From Wildfire:

STEP 1: LAND USE

If the new development is in an urban area or in a suburban area surrounded by other developments, it is probably at low risk.

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If the new development is in or near an area of undeveloped or wooded land, it could be at some risk for wildfire. Go to the next step to further assess the risk.

STEP 2: VEGETATION

Walk or drive around the property that is being developed. What kinds of vegetation are on the property? Will the open spaces have thick woods with continuous shrubbery? Will there be undeveloped land next to buildings? Consider both the internal and external natural areas as you further assess the risk from wildfire.

Vegetation/Ecosystem Type

- *Hardwood Hammocks* -- These ecosystems with leafy trees rarely burn, except during periods of prolonged drought. They generally make shady, fire-safe home sites.
- *Longleaf Pine/Turkey Oak Sandhills* -- Natural fire frequencies of 2 to 4 years lead to relatively cool fires, which maintain the pine forest and promote flowering of diverse grasses and herbs. This ecosystem thrives with frequent fires, and is ideal for safe prescribed burning compatible with development.
- *Pine/Palmetto Flatwoods* -- Natural fire frequencies of 2 to 4 years maintain grasses and herbs and prevent shrubs from dominating the surface of the forest. Flatwoods fires are of medium intensity and can move quickly if not maintained with periodic fire. The greater the shrub component, the higher the intensity of fires that occur. More frequent fires during the growing season limit shrub accumulation.
- *Pine Rocklands* -- Natural fire frequencies of 3 to 7 years maintain this South Florida flatwoods-like ecosystem, and keep hardwood hammock species from crowding out rare plants. Fires are generally low intensity, unless flammable invasive species, such as melaleuca, take root.
- *Sand Pine/Oak Scrub* -- Longer natural fire frequencies of 10 to 60 years result in high-intensity, forest-replacing fires, which are integral to maintaining this unique ecosystem. The hot fires in scrub are less compatible with development. However, careful prescribed burning under the right conditions has been used in some coastal areas.
- *Wetlands* -- Natural fire frequencies for wetlands vary from 10 to 100 years, promoting flowering of grasses and herbs while reducing shrub competition and build-up of smoke-producing ground fuels like muck. Development can successfully border periodically burned wetlands.

The Florida Forest Service (FFS) provides an Internet mapping tool, Wildland Fire Risk Assessment System that provides information about the potential risk from wildland fire for specific locations (www.floridaforestservice.com/wildfire/wf_fras.html). Contact the FFS if you need help assessing wildfire risk (www.floridaforestservice.com/wildfire/index.html).

If you are building in an undeveloped ecosystem that experiences frequent fire, you can adapt the design to facilitate the use of prescribed fire as a management tool and defend the development more easily from wildfire.

Fire Behavior

To protect developments from wildfire, it helps to understand how fire behaves. Two main facets of fire behavior in Florida are **fuels** and **weather**; they determine whether the result is a damaging wildfire.

Surface-level fuels are the primary means by which wildfire spreads through a forest. These fuels include dead materials such as dried grasses, weeds, and pine needles. Surface-level fuels in Florida also include living green vegetation like palmettos, shrubs, grasses, plants and small trees. Many of these plants are adapted to fire: they burn easily and they re-sprout quickly after fire. All of these fuels burn more readily during drought conditions. When periodic fire occurs, vegetation stays at manageable levels. Without periodic fire, plants grow more densely and dead material accumulates, making them more flammable. Under certain conditions, these built-up fuels support the rapid spread of dangerous wildfire. If a fire starts in a forest with heavy surface-level fuels, the fire can climb up vines or small trees, called *ladder fuels*, and get into the tops, or *crowns*, of tall pine trees. In windy conditions, a fire spreads quickly through a forest with dense vegetation, making it very hard to manage. The worst wildfires of 1998 were crown fires or intensely hot surface fires in heavy accumulations of palmetto shrubs and pine needles.

Weather factors that influence fire behavior include wind, relative humidity, temperature, rainfall, and atmospheric stability. An unstable atmosphere (one conducive to hot air movement), gusty or down drafting winds, low humidity, high temperatures, and drought conditions can contribute to fast-moving fires. Generally, wildfires burn out of control when there is a combination of heavy fuels and *several* dangerous weather conditions. In 1998, drought, low humidity, and gusty winds combined with high temperatures and heavy fuels to generate devastating wildfires.

Recommendations for Designers, Developers, and Decision Makers

People enjoy living close to nature in Florida. The natural ecosystems of Florida provide many valuable services, including clean air and water, soil stabilization, wildlife habitat, flood control, and crop pollination, as well as beauty and inspiration. People highly value these natural surroundings. As a result, many new developments include green spaces, trails, and natural vegetation.

The trick for new developments is to help people safely live or conduct business within a natural landscape that includes periodic fire, to generate homeowner support for the use of prescribed fire, and to reduce wildfire risk. The following recommendations to accomplish these goals apply to subdivisions, businesses, and individual homes being built in or adjacent to high-risk, fire-prone ecosystems. Developments being built in low-risk areas should continue to be designed for aesthetic appeal, water and energy savings, and nature conservation.

1. Planning and Designing Defensible Developments in Fire-Prone Areas

- Design community protection zones around the subdivision where vegetative fuels are reduced and maintained. Ponds, wetlands, paved or gravel streets, golf courses, utility corridors, and mowed areas may serve as "fuel breaks" that can slow or stop the spread of fire. Community protection zones are typically 100 to 300 feet wide, depending on wildfire risk levels. Although walls or solid fences may provide some fire protection, they prevent the free movement of wildlife and do not protect against burning embers being lofted over the barriers.
- Design green space so that fuels can be periodically reduced by prescribed fire or mechanical means. Include ongoing fuel reduction measures (burning, mowing, thinning of trees) in green space and rights-of-way management plans. Conduct a pre-construction prescribed burn and thinning of pine trees (FFS can assist). Maintaining one larger green space (rather than scattered small areas) provides for more efficient fuel management, better wildlife habitat, and development of a recreational area for residents.
- Provide, develop, or identify water sources for fighting wildfires. Areas with municipal water supplies should have a pressurized hydrant system. Strategically placed storm-water drainage and retention features can also be used by fire-fighting crews.
- Provide at least two access routes in and out of a development, preferably on opposite sides.
- Provide noncombustible metal street signs, sign posts, and house numbers visible from 100 feet.
- Request review of development plans by FFS or local fire departments in order to provide the most appropriate levels of fire safety. Include projected fire protection needs in plans.
- Have an emergency wildfire management plan for your development. Contact the FFS or local fire department to discuss the elements of a wildfire management plan, which might include maps of fuel breaks and water sources, evacuation plans, and designated safety zones where residents can gather in the event of a wildfire.

2. Building Firewise Structures

- Construct large developments in phases to avoid prolonged exposure of homes to vacant or overgrown neighboring lots.
- Design a 30-foot-wide defensible space, or buffer zone, around buildings. Defensible space is an area of modified vegetation that allows access for fire-fighting equipment and protects the home by reducing nearby vegetative fuels. Tall trees and fire-resistant landscape plants can be strategically placed and regularly maintained in this zone.
- Avoid using combustible or heat-sensitive building materials such as vinyl or wood siding and soffits, vinyl soffit vents, or wood shingles. Brick, concrete, rock, stucco, or metal (roofing or screen soffit vents) are preferred building materials for homes adjacent to fire-prone undeveloped areas.
- Put spark-arresting screens on chimneys. This is a leading entryway for wildfire's burning embers into the interior of homes.
- Provide hose bibs on all sides of the structure.
- Provide a fire-safe area for combustible items--propane tanks, woodpiles, or flammable materials--at least 30 feet from each building.

3. Managing Developments for Maximum Natural Areas and Minimum Wildfire Risk

- To protect both developments and natural resources, cooperate with adjoining land owners to promote the use of prescribed fire for reducing fuels within your development and on adjacent undeveloped lands. Prescribed burns should only be conducted by trained and equipped personnel.
- Design the development to accommodate fuels management or prescribed fire on a regular basis, before times of high fire danger (spring months in Florida). Work with

FFS or a professional forester to perform a risk assessment and write a fuel management plan.
- In community covenants and restrictions, include wildfire prevention measures governing the appropriate placement of structures, management of vegetation, maintenance of defensible space, burning of yard waste, and storage of combustible materials.
- Inform and prepare residents and businesses for the steps that are being taken to manage fuels and prevent wildfire, such as prescribed burning.
- Educate residents about the major leading causes of wildfire in Florida—unattended backyard fires (e.g., unmonitored barbecuing or debris burning), arson, and other human activities. Include reminders about safe fire use and extinguishment around the home, and be sure to include children in the discussion.
- Before spring wildfire season, take extra precautions such as burning or mowing fuel breaks, clearing accumulated vegetation from around developments, and ensuring clear access to water sources.
- Seek insurance credits for wildfire risk reduction.
- Assign long-term fire prevention and management responsibilities for the community to guarantee benefits into the future.

Keys to Fire-Safe Development

Fuels and weather are major influences on fire in Florida. We can't control the weather, so management of vegetative fuels and building of fire-safe neighborhoods are the keys to wildfire prevention in fire-prone areas. Planners, developers, designers, architects, builders, wildfire specialists, fire fighters, and regulators should cooperate to establish guidelines for fire-safe communities in Florida.

Another key to wildfire prevention is cooperation between owners of neighboring parcels of land. Wildfire prevention is bigger than any single property. If both your company and neighboring landowners manage vegetative fuels with prescribed fire, both your development and the neighboring natural resources will be better protected from fire risk. If only one of you manages vegetative fuels, both of you may still be at risk of wildfire. Just as wildfires can come from undeveloped areas to threaten homes and businesses, fires often start from carelessness in human developments and spread to threaten valuable natural resources on neighboring lands.

Balancing the Risks with the Costs

Some wildfire prevention measures may result in increased energy or water costs, loss of privacy, or reduced aesthetic values for potential homeowners. For developments in fire-prone areas, these additional costs are insignificant compared to the potential loss of lives and property. Recent trends show that buyers are willing to pay more for a home near a natural area or open space. The cost of preventing wildfire is another form of insurance that should be included in the purchase price of a fire-safe home or business.

Other wildfire protection measures may be free or nearly free of cost. There are many low- or no-cost alternatives for achieving wildfire prevention objectives that also may enhance the value of a development. Planning for defensible space around a development can still allow for trees and shrubs that provide shade and attract wildlife. Rather than removing all vegetation, developers can maintain a canopy of large trees while reducing the ground-level vegetative fuels that can carry a fire. Landscape architects and designers can substitute less-flammable native plants to gain fire prevention, water conservation, and wildlife habitat benefits. Designing the development to allow necessary features (roads, parking, water retention ponds, etc.) to double as fire breaks will reduce wildfire vulnerability at little or no cost.

With these guidelines in mind, you will invent other creative ways to achieve the many goals that homeowners value: wildfire prevention, energy and water conservation, native plants and wildlife habitat, and a beautiful place to work and live.

Visit the Florida Forest Service website to access several excellent resources and publications related to wildfire risk reduction (www.floridaforestservice.com/wildfire/index.html). From this website, you can contact your county's Wildfire Mitigation Specialist, who can assist with specific questions. For detailed recommendations, see the Wildfire Risk Reduction in Florida: Home, Neighborhood, and Community Best Practices manual (http://www.floridaforestservice.com/wildfire/wf_pdfs/Wildfire_Risk_Reduction_in_FL.pdf).