



FLORIDA'S EMERGING FOREST THREATS

**Management Options
for Healthy Forests**

WHY DOES IT MATTER TO ME ?

It is important for private forest landowners to prepare for the likelihood of increasing threats to their forest lands. Private forests make up the largest holdings of forestlands in the southeastern U.S. These properties collectively will be crucial in protecting the overall health of our landscape. Management that takes the most current science into account will enable landowners to better protect their land and resources and to contribute positively to the conservation and productivity of Florida's forestlands.



Southeast Climate Hub
U.S. DEPARTMENT OF AGRICULTURE

The mission of the Southeast Climate Hub is to develop and deliver science-based, region-specific information and technologies, with USDA agencies and partners, to agricultural and natural resource managers that enable climate-informed decision-making, and to provide access to assistance to implement those decisions. This is in alignment with the USDA mission to provide leadership on food, agriculture, natural resources, rural development, nutrition, and related issues based on sound public policy, the best available science, and efficient management

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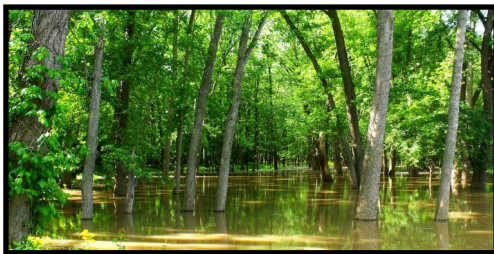
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EMERGING THREATS & HEALTHY FOREST MANAGEMENT

Introduction - The state of Florida is blanketed with a patchwork of pine forests, hardwood swamps, and savannahs that cover nearly 17 million acres, which is roughly 50% of the state's land area. Around two thirds of these forest systems are privately owned. Just over half of these forests are predominately composed of slash and longleaf pine. However, hardwoods such as live oak, sweetgum, tupelo and blackgum, water oak, and ash are common in many areas. These forests are crucial to Florida's economy with approximately \$25 billion of annual economic impact. The ecosystem services Florida's forests provide have an estimated value of \$30 billion a year as well. However, many threats exist and cause major damage every year. Some of Florida's major forest threats include invasive species, disease, and hurricane activity. Management options to mitigate or adapt to these damages while increasing forest resiliency are available to landowners and forest managers.



Threats from Flooding - Extreme precipitation events from storms and hurricanes can destroy coastal and inland forests. Flooding is a common disturbance event within the southeast U.S. due to the frequency of extreme (more than 2.5" in a day) rainfall events. Floods impact forest productivity by altering soil conditions and exposing or burying root systems. Reductions in stream water

quality, aquatic habitat, the aesthetic value of recreational areas, and soil productivity can also be observed after flood events. Management practices to mitigate damages include post-disturbance revegetation, maintaining the area's natural hydrology and riparian zone health, planting flood-tolerant tree species, monitoring damaged or susceptible trees for outbreaks or fungal growth, and the installing proper erosion control structures such as culverts and drainage ditches where needed.

Threats from Wildfire - Increased fuel loads and more frequent droughts could increase wildfire frequency and intensity within the southeast, with Florida suffering up to \$400-600 million in timber losses during years with intense wildfire activity. Other impacts include habitat destruction and fragmentation, and biodiversity declines. Prescribed burns to reduce these fuel loads and periodic thinning remain essential techniques. However, timing and control must be appropriate during periods of drought. Salvage logging after extreme weather events or significant timber losses reduces fuel loads and the risk of pest or disease outbreaks. Incorporating fire-resistant species such as longleaf pine and yellow poplar may also mitigate wildfire losses.



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Threats from Hurricanes/Tornadoes - A single hurricane - Hurricane Michael - caused \$1.3 billion in



forest damage over a wide area. Likewise, tornadoes can also cause billions of dollars in damages. Increases in hurricane intensity and storm frequency are related to warming air and water temperatures. Therefore, annual forest damage is likely to increase in the coming years. Other impacts of severe storms can include habitat and recreation area destruction, reduced biodiversity and water quality, and inland soil salinization from storm surge events. Adaptation to mitigate wind damage from these events includes rotational harvesting

to reduce stand age uniformity, incorporating wind-resistant species, modifying thinning frequencies, and clear-cutting smaller exposed stands at maturity while avoiding clear-cut operations within large stands.

**Threats from Invasive Species/
Insects/Disease** - Invasive species cause roughly \$30 million in forest damage annually. Insects and disease are estimated to cause tens of millions of dollars in losses in Florida and can impact forest productivity and species diversity. Warmer temperatures



associated with climate change can extend the tree growing season, but also extend the outbreak season. Additionally, invasive species may outcompete native or planted species for resources during periods of drought. They also may lead to habitat destruction or fragmentation and loss of aesthetic value in recreational areas. Invasive species are particularly prevalent in the southeast due to the region's mild winters that fail to kill imported insects and plants. Management practices to mitigate these threats include prescribed burning, thinning, proper herbicide or pesticide application, sanitation, and decreasing the movement of untreated wood. Early detection is critical to finding outbreak areas before the problem can multiply and spread.

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Threats from Drought - Increasing drought frequency and extreme heat damage forest stands and ecosystems in Florida each year, while also impacting water quantity and quality and biodiversity. Heat and water stress can leave stands more vulnerable to pests and diseases and may result in substantial dieback. Drought conditions also lead to increased wildfire potential, accelerated soil organic matter decomposition, and changes in vegetation. Adaptation options include thinning to reduce stand water stress, maintaining a canopied riparian zone to reduce stream temperatures, incorporating drought-resistant species, and using prescribed burns to reduce fuel loads and wildfire risk. Monitoring for signs of disease or pest activity will provide an early advantage to landowners for fighting outbreaks.



Threats from Sea-Level Rise - Accelerated sea-level rise has been correlated with warming sea surface and air temperatures. Due to this trend, southeastern coastal states like Florida have experienced soil salinity issues moving further inland, resulting in severe forest damage and the overall loss of productive lands. Other impacts include vegetation changes, biodiversity, and habitat loss, water quality declines, and increased invasive species

outbreaks. One adaptation option for event salinization, such as storm surges, would be to plant salt-resistant species. As salinity moves towards being a chronic issue, implementing short-rotation woody crops may retain profits while decreasing risks from storm surge events. Drainage system installation may reduce the probability of developing salinity issues by lowering water table height.

Summary - These threats impact the economic and ecosystem value of Florida's forestlands. Threats of salinization from sea-level rise, insect and invasive species outbreaks, destructive wildfires, and intense hurricane activity are amplified by warming temperatures and changes in rainfall frequency and amounts. The adaptation methods listed here are just a few of the available options that help land managers improve resilience and reduce risk. Consult your local forest extension agent or a county forester for more information about threats and mitigation and adaptation measures appropriate for your forested land.

FOR MORE INFORMATION ON
MANAGEMENT OPTIONS FOR YOUR
WOODLANDS:

Contact your local County Forester or the
Florida Forest Service Office at
(850) 681-5880

www.FDACS.gov/floridaforestservice