ASSESSING THE POTENTIAL EFFECTS OF CLIMATE CHANGE ON KISATCHIE NATIONAL FOREST

Forestlands across the region are experiencing increased threats from fire, insect and plant invasions, disease, extreme weather, and drought. Scientists project increases in temperature and changes in rainfall patterns that can make these threats occur more often, with more intensity, and/or for longer durations. Although many of the effects of future changes are negative, natural resource management strategies can help mitigate these impacts. Responses informed by the best current science enable natural resource professionals within the Forest Service to better protect the land, resources, and the region's forestlands into the future.

Forest Health - Invasive plant and insect species may increasingly outcompete or negatively affect native species in the future. Winter freezes historically limit the range of forest pests but higher temperatures will likely allow increases in their number and spread. Drought and other factors will increase the susceptibility of forests to destructive insects such as the southern pine beetle. Certain invasive plant species found in this forest, including kudzu, are expected to increase dramatically as they can tolerate a wide range of harsh conditions, allowing them to rapidly move into new areas.

Response: Manage tree densities through practices such as thinning and prescribed fire to maximize carbon sequestration and reduce the vulnerability of forest stands to water stress, insect and disease outbreaks, and wildfire.
Response: Continually monitor for new invasive species moving into areas where they were not traditionally found, especially following events such as hurricanes, tornadoes, and fire.

Kudzu

Plant Communities - Heat stress may limit the growth of some southern pines and hardwood species. Stress from drought, overall increased temperatures, and wide-scale pest outbreaks have the potential to cause large areas of forest dieback. Intensified extreme weather events, such as tropical storms, hurricanes and wildfire, are also expected to cause changes in plant community composition. Species more resistant to these disturbances will be more resilient to a changing climate. Plant species such as the endangered green pitcher plant require moisture-rich soils and may decline due to increasing drought.

Green pitcher plant

Response: Focus restoration efforts in hurricane-resistant forests, such as longleaf pine as well as sweetgum or red oak hardwood.
Response: Manage for a range of ages and species in forests to lessen potential loss from drought or infestation.

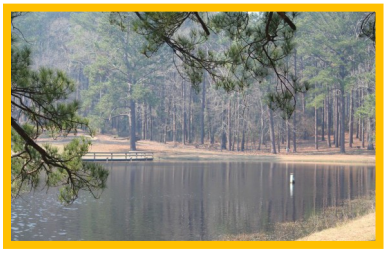
Animal Communities - Wildlife species will be affected in different ways. Amphibians may be most at risk, as suitable habitat decreases due to warmer, dryer conditions. Avian species, such as the federally listed endangered red-cockaded woodpeckers, may see a decrease in population as vegetation types change and heat stress makes their food sources more difficult to come by. Alternatively, deer populations may increase due to higher survival rates during warmer winters.

Red-Cockaded Woodpecker

Response: Maintain piles of natural woody debris in areas of high amphibian diversity to supplement habitats that retain cool, moist conditions.

Response: Create habitat corridors, assist in species movement, and identify high-value conservation lands adjacent to National Forests.

Coastal Ecosystems - Coastal areas in the Southeast have already experienced an average of one inch of sea level rise per decade over the 20th century, a rate that will continue to increase in the future. Rising sea levels, in combination with more intense hurricanes, will alter the composition of coastal marshes. As saltwater flooding expands, low-lying coastal forests and wetlands could become marshland or turn into ghost forests where land-use barriers do not exist. Sea level rise can also increase the potential for saltwater intrusion into coastal freshwater tables. Increasing salinity of coastal aquifers may affect groundwater resources within three miles of the coast.



Catahoula District

Response: Identify and preserve landward migration corridors next to coastal wetlands that can allow these ecosystems to shift landward as sea levels rise.

Extreme Weather - The potential for severe storm events is expected to increase in the future including more intense hurricanes making landfall in the southern US. Extended periods of extreme high temperature and drought may lead to drier forest fuels which will burn more easily and contribute to larger and more frequent wildfires. More cloud-to-ground lightning due to warming may also increase wildfire ignitions.

Kisatchie Forest

Response: Identify areas that provide particularly valuable ecosystem services, like timber harvest or carbon sequestration, and are also vulnerable to extreme weather, like hurricanes or wildfires. Then plan conservation strategies (e.g. thinning, selective species planting) accordingly to mitigate extreme weather impacts.
Response: Reduce increased wildfire potential by conducting prescribed burns.

Kisatchie Forestry Center

Water Resources - Shifts in rainfall patterns will lead to periods of flooding and drought that can significantly impact water resources. Increases in heavy downpours and more intense storms can lead to greater erosion and more sedimentation in waterways. Increased periods of drought may lead to poor water quality, more variable stream flow, and loss of quality aquatic habitat. Geographically isolated wetlands are critical wildlife habitat and can be impacted by changes in surrounding landcover.

Response: Reduce the amount of water taken in by surrounding trees and plants, using management strategies such as thinning and prescribed burns, in order relieve stress on isolated wetlands and streams.
Response: Restore and reinforce vegetation in headwater areas to help alleviate runoff of sediment during heavy rain, reduce climate-induced warming of water, and decrease water sensitivity to changes in air temperature.

Recreation - Environmental changes may negatively impact recreational experiences due to changes in the plant and animal communities that make those experiences unique. More days above freezing could increase tick and mosquito populations throughout the year, leading to an increase in vector-borne illness. With more days of extreme heat, recreation areas could see decreased use in the summer if temperatures impact visitor comfort.

Response: Communicate early warnings for extreme weather to protect vulnerable groups from health impacts, such as heat illnesses, and monitor for early outbreaks of disease.

Climate Change and Your National Forest: Citations

Information in this factsheet is summarized from 52 peer-reviewed science papers found in the USDA Forest Service's TACCIMO tool. TACCIMO (the Template for Assessing Climate Change Impacts and Management Options) is a web-based application integrating climate change science with management and planning options through search and reporting tools that connect land managers with peer-reviewed information they can trust. For more information and the latest science about managing healthy forests for the future visit the TACCIMO tool online: **www.forestthreats.org/taccimotool**

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