



Forest Habitat Restoration and Maintenance

By: Logan Ridgeway



Education Background

- + Associate of Science Degree from Snead State Community College
- + Bachelor of Science Degree in Wildlife Ecology and Management with a Business minor from Auburn University
- + Master of Natural Resources Degree in Forestry from Auburn University



Experience Background

- + Worked on multiple wildlife research projects, especially with white-tailed deer and wild turkey
- + Worked three internships managing habitat on multi-thousand acre tracts of private property
- + Worked as a forestry intern with the U.S. Fish and Wildlife Service
- + Current prescribed burn manager and wildland firefighter



Management Goals

- + Restore forests to the point that they function as part of a natural healthy ecosystem
- + Restoration of longleaf pine is a priority because of its unique ecological function and the variety of native species that it supports
- + Much of the historic longleaf forest in this area has been lost due to human interference such as the loss of regular fire on the landscape and conversion of forest land to plantation timber stands



Management Goals Continued

- + The rehabilitation of forests that support and provide high-quality habitat to native wildlife with a particular focus on the threatened and endangered species found on St. Marks Nation Wildlife Refuge (SMNWR)
 - + Threatened and endangered species include the Frosted flatwoods salamander, Red-cockaded woodpecker, Eastern Black Rail, and Tricolored Bat
 - + Native game species and nongame species are of management concern as well



Management Goals Continued

- + Providing quality recreation opportunities for the public is another secondary goal considered for all habitat management activities
 - + Ex: Hunting, hiking, fishing, birding, and biking



Environmental Challenges to Overcome

- + Climate change and the problems associated like rising sea levels, extreme temperature swings, increasingly unusual weather events, and less consistent/predictable weather
- + The weather even if typical in pattern creates a challenge due to timing constraints
 - + For example rain can inhibit or stop most of the fieldwork that we do for both the rain event itself and if the landscape becomes inundated with water work can be halted for weeks or months before conditions reach a point acceptable let alone favorable to work
- + Past management of land including some recently acquired by the refuge has led to a drastic alteration to the hydrology due to old commercial forestry practices such as bedding and ditching implemented in an effort to dry out some of the land



Ecological Challenges to Management

- + All wildlife species vary in the required, acceptable, and ideal conditions needed to survive
- + The ecosystem and habitat conditions needed for different species to survive can be almost identical, partially match, or be entirely different
- + Some wildlife species can be generalists, like whitetail deer, and live in many habitat types of varying condition
- + Some wildlife species can be specialists, like Red-cockaded woodpecker, and require specific habitat types of a very specific condition
- + The time frames for when we can do forest restoration work can also be dependent on wildlife species' life cycles such as working around breeding seasons or stages where they may be particularly vulnerable

Ecological Challenges Continued

- + The second part of the ecological challenge is considering the plants and their conditions needed for success
- + Coordinating restoration or maintenance management activities with the life cycle of trees and other vegetation is crucial
- + Considering competition between members of the same species, known as intraspecific species competition, is important
- + Consideration must also be put towards interspecific species competition which is the competition between members of different species
- + For these reasons the balance of creating healthy forest habitat for many different wildlife species and meeting our management goals becomes very difficult

Societal Challenges to Management

- + People want to have access to areas on the refuge
- + Man-made infrastructure has to be protected and maintained
 - + Ex: roads, trails, signs, buildings, and powerlines
- + Keeping management activities (like prescribed fire and mechanical work) within refuge property boundaries
- + Educating and informing the public about management activities to keep a positive relationship
- + Fragmentation of ecosystems from human development that hinder the movement of wildlife and disrupt natural ecosystem functions like wildfire and water flow across the landscape

Societal Challenges Continued

- + The development and urbanization of land in proximity to the refuge reduces the amount of forested habitat available for wildlife and creates more concerns for implementing prescribed fires
- + Smoke management from prescribed burns is an increasing area of concern as more people view the smoke as a nuisance and smoke-sensitive areas become more pervasive

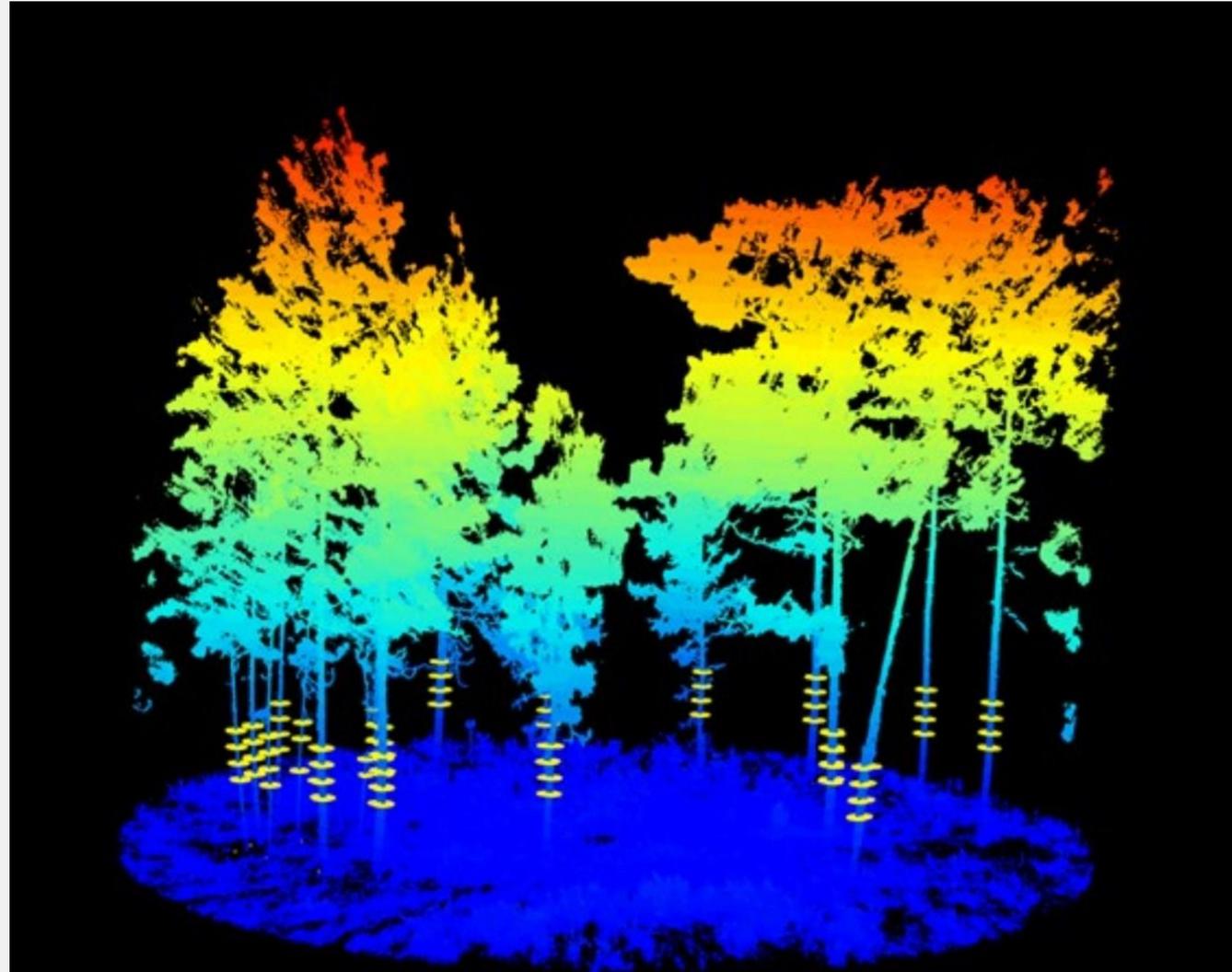


Economic Challenges to Management

- + Consistent funding for habitat restoration and maintenance is hard to acquire
- + Habitat management is almost always an expense that does not generate a commercial value in return
- + Timber harvest is the only management tool that produces any revenue and that revenue generally gets spent implementing other restoration efforts
- + Often time when logging or harvesting timber is implemented for ecological benefits to restore habitat the revenue generated is reduced compared to commercial logging because of the limitations placed on the logging to meet restoration objectives

Informational Management Tools

- + LiDAR which stands for Light Detection And Ranging is a remote sensing tool that is quickly advancing to provide more data and benefits to managers in the natural resources field
- + Satellite-based LiDAR imagery is utilized to get broad-scale vegetation and topographic data
- + Aerial LiDAR imaging provides more detailed medium-scale data on vegetation and topographic data
- + Terrestrial LiDAR allows for the collection of fine-scale and detailed forest composition data



Informational Management Tools

Continued

- + Timber Cruising – is the collection of desired tree data for a forest to check management quality and inform future habitat management
 - + Performed with standard forestry equipment like a compass, logger tape, clinometer, prism lense, or laser.
 - + Mutiple cruising methods are available such as fixed radius plots, variable radius plots, linear plots, and so on.
 - + Can collect data on tree⁺height, live crown ratio, diameter of a tree at breast height, trees per acre, basal area, and merchantable tree height.
- + Vegetation Sampling – is the collection of biomass/vegetation data such as species, height, and percent cover
- + Tree Seedling Survival Surveys – are done to sample areas that have recently been planted for mortality and determine if the mortality rate is acceptable or needs to be addressed and the driving factor of the mortality determined

Management Tools

+ Timber Harvest

- + Clear-cut – this is removing all of the trees from a stand and is an good option if there are no desirable trees on the stand (generates the most revenue relative to the timber value and area harvested)
 - + Select cut – removes the undesired trees and leaves desired trees in the stand (there are a multitude of methods and techniques that fall under this type of harvest) Ex: thin from above, thin from below, and Stoddard-Neel Method
 - + Thinning – removing trees to reduce competition between the trees and is usually an intermediate step (can be done before trees are merchantable or after)
- ## + Tree Planting- is a way to speed up the restoration of forests and introduce regeneration to a stand



Management Tools Continued⁺

- + Prescribed Fire – can be used to influence the species composition and structure in an area and is great for controlling organic matter build-up
 - + It provides a physical, chemical, and thermal effect on ecosystems



Management Tools Continued⁺

+ Chemical Application – Herbicides and Pesticides

- + Broadcast Application – is a more general and less controlled method of treating an area but is great for covering large areas that have prolific numbers of the target organism for the chosen chemical done as a foliar application (Tools of application: boom sprayer on a ground-based vehicle, boomless sprayer on ground-based vehicle, backpack sprayer, or aerial)
- + Spot Application – is a selective and targeted application method for treating an area but hard to cover large areas and is labor intensive can be done as a foliar application, basal application, hack and squirt application, or cut stump application (Tools of application: backpack sprayer, squirt bottle, and injection)
- + Provides only a chemical effect



Management Tools Continued⁺

+ Mechanical Mastication

- + Mulching – can be used to knock down larger vegetation but is slow and more expensive
 - + Mowing – used to knock down small vegetation
 - + Roller Chopping – used to knock down small to medium-sized vegetation and can break up root mats by cutting through them
 - + Provides only a physical effect
- ## + Plowing – can loosen up compacted soil, cut small root mats, and allow plants that have been excluded by competition but are still present in the seed bank to grow

Photos

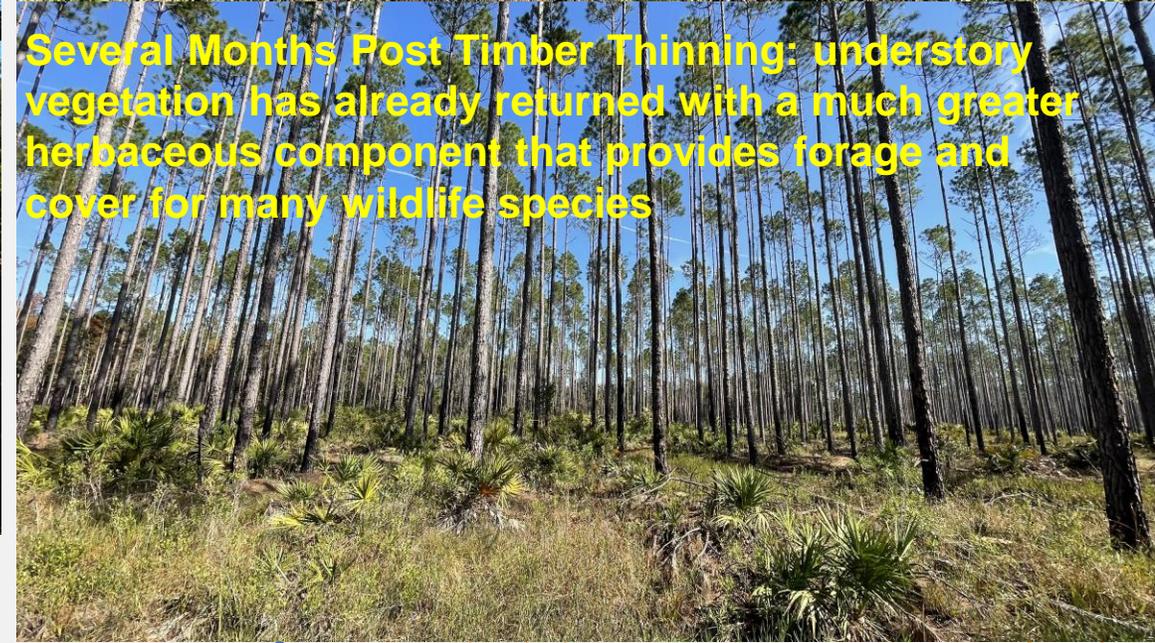


Photo Quiz

