
Sam Dillon

Wildlife in the Longleaf Ecosystem

Diversity and Management

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Longleaf Forests = Diversity

- **Global hotspot for biodiversity**
  - ❖ **plants and animals**
- **Longleaf pine forests provide habitat for:**
  - ❖ **Nongame & game species**
  - ❖ **Endangered, Threatened and At-risk species**
  - ❖ **Native pollinators**

Who lives in Longleaf ecosystems?

~ 60% of southeastern amphibian and reptile species

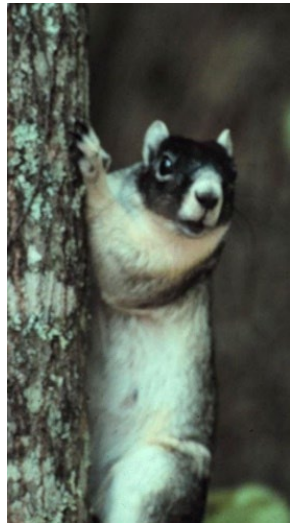
Habitat for more breeding birds than any other southeastern forest type

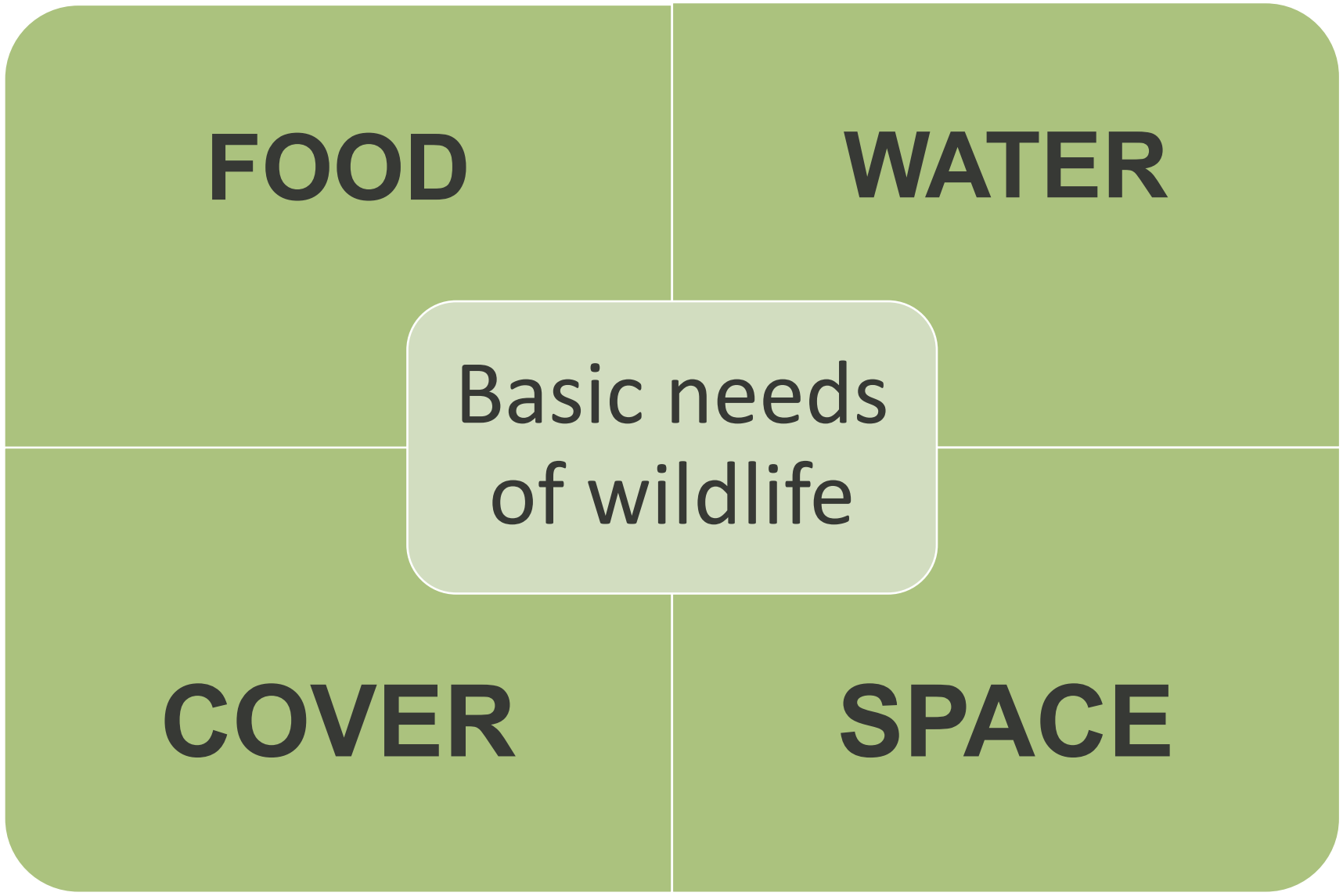
Used by ~ 36 mammal species









FOOD
WATER
Basic needs of wildlife
COVER
SPACE

Maintaining and managing longleaf cover

- **Silvicultural techniques**
  - Restoration
  - Thinning
  - Hand-clearing
  - Herbicides
- **Prescribed fire**

Fire as a wildlife management tool

+ Fire →

Benefits of Prescribed Burning for Wildlife

- Sets back succession
- Stimulates plant growth which provides food and cover
- Recycles nutrients
- Sets back succession for better cover
- Stimulates germination of seeds in the soil
- Stimulates flowering and seed production of many native species

Fire Influences Habitat

Results are highly dependent on:

- Burn frequency
- Time of year (seasonality)
- Rotation of burns across the landscape
- Scale (acres)
- Intensity

Fire as a Management Tool

Management of Wildlife in the Longleaf Forest

- Reptiles and Amphibians
- Birds
- Mammals
- Pollinators

Diversity of Wildlife in the Longleaf Ecosystem

Specialists

- Depend on the longleaf ecosystem through all phases of life
- Are not found, or are not viable, in other systems
- Especially vulnerable to habitat loss

Generalists

- Utilize the longleaf ecosystem for all or parts of their life; pass through
- Exist in other habitats; not confined to longleaf
- Species range includes longleaf

Reptiles and Amphibians

- About 170 species of reptile and amphibian are found in the range of longleaf pine
- Many are specialists
- Many are threatened, endangered, or candidates for federal listing

Ecological Roles of Amphibians and Reptiles

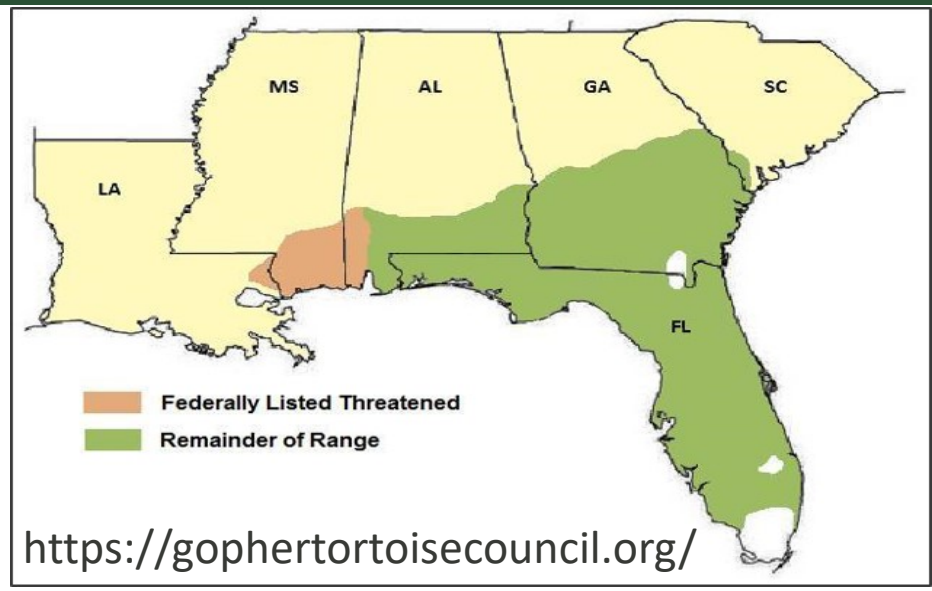
- Regulate prey population density (insects, mammals, bird, and other reptiles/amphibians)
- Food sources for predators
- Seed dispersers for some understory plants
- Engineer habitat for other species of wildlife
- Indicator of forest health

Reptile Case Study: Gopher Tortoise *Gopherus polyphemus*

- Strict longleaf specialist
- Herbivorous
- Only tortoise species in eastern US
- Long lived -> up to 60 years old
- Requires open, fire-maintained forests
- **Longleaf Ecosystem Engineers**

GT **Threatened or Endangered** in all states in range

- **Habitat loss** - development and/or conversion
- **Habitat fragmentation** - roads, parcelization, etc.
- **Habitat degradation** (fire suppression/exclusion, lack of proper management



https://gophertortoisecouncil.org/

Other secondary threats

- Insufficient size of some remnant populations for genetic viability over time
- Disease such as upper respiratory tract disease (URTD)
- Human harassment, consumption, or collection
- Other incompatible human activities and recreation

Management: Allowing sunlight to reach forest floor

Amphibians in the longleaf ecosystems

- Amphibians need both upland and wetland habitat
- Ephemeral wetlands, small ponds, and bogs are all important breeding habitat

Tiger salamander

Amphibian Case Study: Reticulated Flatwoods Salamander *Ambystoma bishopi*

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Wetlands can become fire suppressed

- Thick, dense mid-story
- Little herbaceous groundcover
- Overabundance of shrubby plant species resulting in:
  - shorter hydroperiods
  - Changes in water chemistry/temperature
  - Hinders amphibian movement from upland to breeding pond or vice versa

Management: Opening up the canopy

- Growing season burning (or when wetland is dry) to reduce/eliminate the mid-story and promote the groundcover

- May need to utilize chemical or mechanical methods to remove large brush and trees

Results: Opening up the canopy

Benefits:

- **Improved breeding habitat for salamanders**
- **More sunlight**
- **High plant & animal diversity**
- **Increased water levels**

Birds in the longleaf forest

- Longleaf forests provide habitat for resident and migratory birds
  - Benefit from early successional habitat & prefer open canopy

- Many are non-specialist species that overlap the longleaf range

- 6 bird species have a close association with longleaf pine or open pine ecosystems

  - **American Kestrel**
  - **Henslow's sparrow**
  - **Bachman's sparrow**
  - **Red-cockaded woodpecker**
  - **Brown-headed nuthatch**
  - **Bobwhite quail**

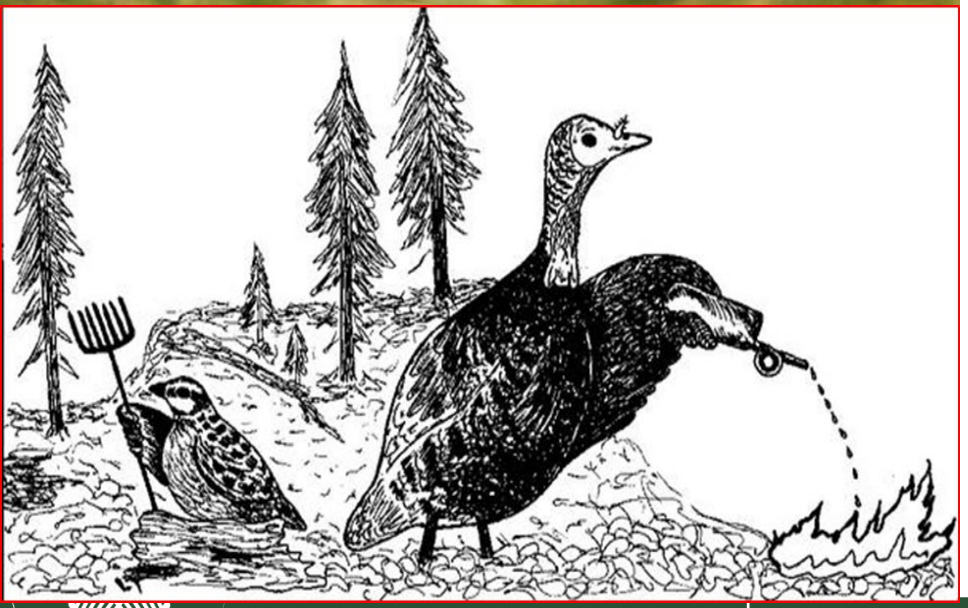
Ecological roles of birds

- Increase biodiversity
- Disperse seeds
- Predators or prey
- Presence or absence can be an indicator of habitat condition

Bird Case Study: Red-cockaded Woodpecker (*Picoides borealis)*

- Only woodpecker to excavate living trees
- Prefer longleaf but will nest in other pines
- Forage on trunks
- Complex social structure
- Cavities used by many other species, increase biodiversity

Bird Case Study: Bobwhite quail (*Colinus virginianus)*



- Known as the “firebird”
- Bunchgrasses for nesting cover
- Forbs for brood rearing habitat
- Woodies for escape cover
- Bare ground to allow for movement, foraging

Management strategies:

- Forest Stand Improvements and thinning
- Planting buffer strips and field borders
- Early successional habitat
- Prescribed burning (and patch burning where possible)

Management to benefit cavity nest species

- Nest boxes add habitat when snags are not available or adequate

Mammals in the Longleaf Ecosystem

- Most are generalists in longleaf and common to many habitats
- ~70% forage on or near the ground
- Seed dispersers, including longleaf pine seeds

Mammal Case Study: Fox Squirrel (*Scurius sp.)*

- Ecological Role: seed dispersers, seed eaters, & prey items
- Diet of acorns, longleaf pine seeds, fruits, insects, & fungi
- Prefer open, mature longleaf stands
- Spend most of time on the ground
- Highly impacted by increases in tree cover
  - Leads to competition with gray squirrels

Management strategies

- Increased canopy cover
- Prescribed fire to maintain lack of tree cover

Pollinators in the Longleaf Ecosystem

- ¾ of plant species endemic to longleaf depend on insect pollination (mostly bees)
- Abundance and diversity of bees increases in areas that are frequently burned
  - Nectar sites
  - Provide foods for adults and larvae
  - Nesting areas

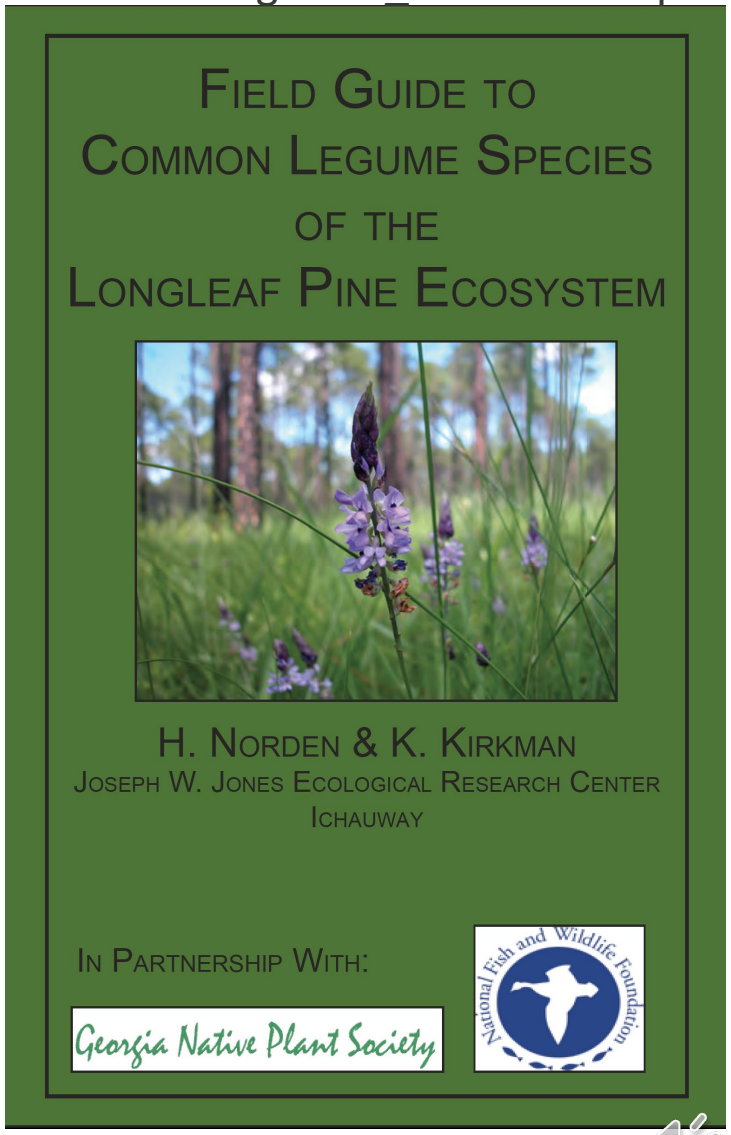
General Wildlife Management Practices

https://www.nclongleaf.org/pdfs/FieldGuideLegumes_JonesCenter.pdf

Increase food sources of Legumes

- Found in xeric to wet sites
- Foliage eaten by white-tailed deer, gopher tortoises, rabbits, and more
- Seeds: bobwhite quail, wild turkey, small mammals, and songbirds

<u>Examples:</u>
beggarweeds (*Desmodium* spp.)
lespedezas (*Lespedezas* spp.)
goat's rue (*Tephrosia virginiana*)
sensitive briar (*Schrankia microphylla*)
butterfly pea (*Clitoria mariana*)



General Wildlife Management Practices: Snags

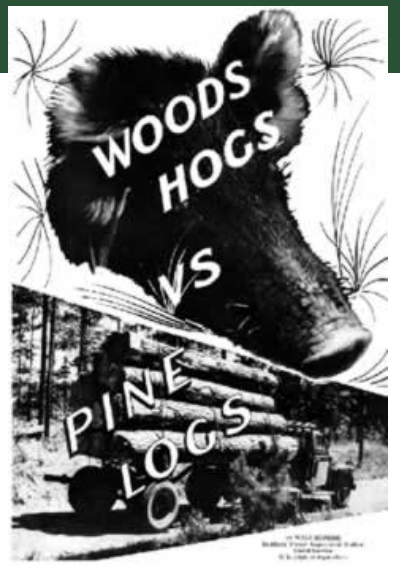
- Snags are important to a suite of cavity-dependent species associated with longleaf.
- Woodpeckers, kestrels nuthatches, chickadees, titmice, flycatchers, Bluebirds, and martins all benefit from snags.
- Removal of snags limits nesting opportunities and increases competition for the remaining resources.

General Wildlife Management Practices: Woody debris and stumps

- Creates physical diversity and for many groundwelling species including snakes, turtles, and lizards
- Key cover for amphibians moving from wetlands breeding sites to terrestrial uplands
- Can be a barrier to movement and accessing food if too heavy

Invasive Species

- Armadillo
- Coyote
- Feral hog
- Fire ants



- The longleaf ecosystem is rich in plant and animal diversity.
- Fire is critical for maintaining the stability, abundance, and complexity of the ecosystem

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