Contemplations about Rx Fires for Understory Goals

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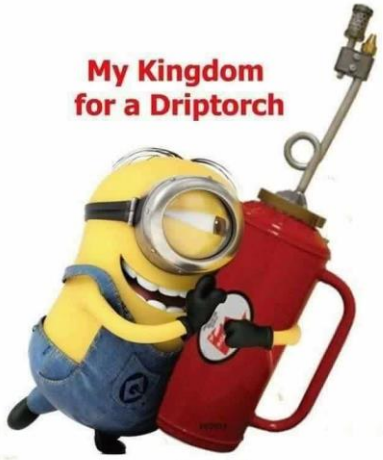
NC Longleaf Coalition/NCFS workshop
May 2017

Preface Point of Consideration:

Regardless of all the details,
at the very least…

BURN!



NC's Rare Plants

♤NC's Rare Plants♤
Wildflower of the Year

From the mountains to the sea, North Carolina is one of the most beautiful and **ecologically diverse** states in the southeast. This diversity is exhibited by the over 4000 native species of plants found throughout the Tar Heel State.

Without intervention, however, North Carolina's natural world may soon suffer of plant species loss.

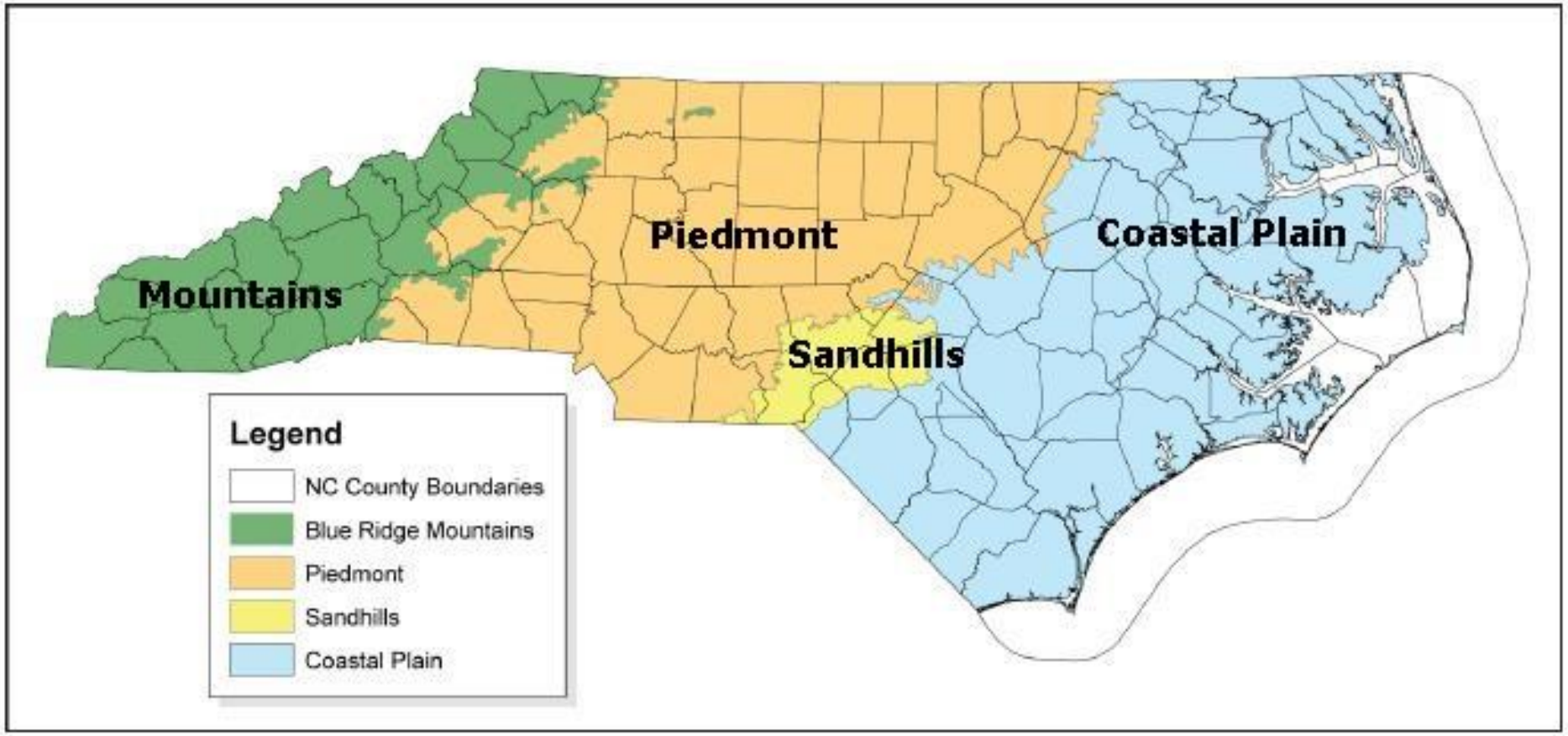
- One in seven plant species in the state is rare -- totaling over 700 species.
- 162 of these species are threatened or endangered in North Carolina.
- Fifteen of the State listed species (about 10%) are now protected on 18 NC Plant Conservation Preserves on a total of nearly 12,000 acres.
- 26 federally endangered or threatened plants grow in North Carolina.

Plant species may be rare for many reasons:

- Some plants are naturally rare because they occur only in specialized site conditions (e.g. rock outcrops or seepage bogs)
- Many species are rare because they occur in natural systems that, historically, have been lost due to conversion of the land to other uses (e.g. agriculture or urban development)
- More species are rare because the natural processes on which they are dependent have been removed from their habitats (e.g. through fire suppression or wetland drainage)

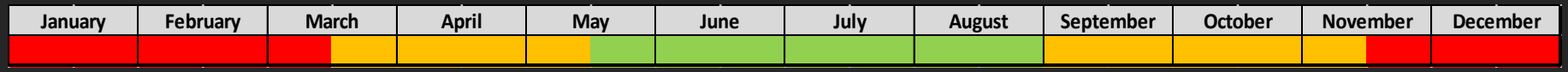
About 75% of the endangered and threatened species in North Carolina require a regular fire regime to reproduce and thrive. An example is the Venus Flytrap. Found only in the Carolinas, this carnivorous plant thrives most when its habitat is burned approximately every 3 years. If the fire return cycle is lengthened and fires are suppressed, Venus Flytrap can be completely lost from a site.

NC Native Plant Society &
NC Plant Conservation Program



NC Wildlife Resources Commission

Variations in “Season” Terminology



Common Terms:

- “Growing Season”
- “Dormant Season”
- “Rx Fire Season”
- “Wildfire Season”

Ecological / Physiologic Terms:

- Dormant season
- Spring Transition season
- Growing Season
- Fall Transition Season

Dormant Season ("Winter")Rx fires:

- promote woody plant resprouting
- reduce some fuel loading/continuity
- can promote some forbs (fire generalists)
- can protect some wildlife species*
- "more predictable" weather patterns
- more consistent fuel/ground moisture
- reductions in fire behavior (flashiness)
- can reduce risks to timber values
- can be utilized for logistical purposes

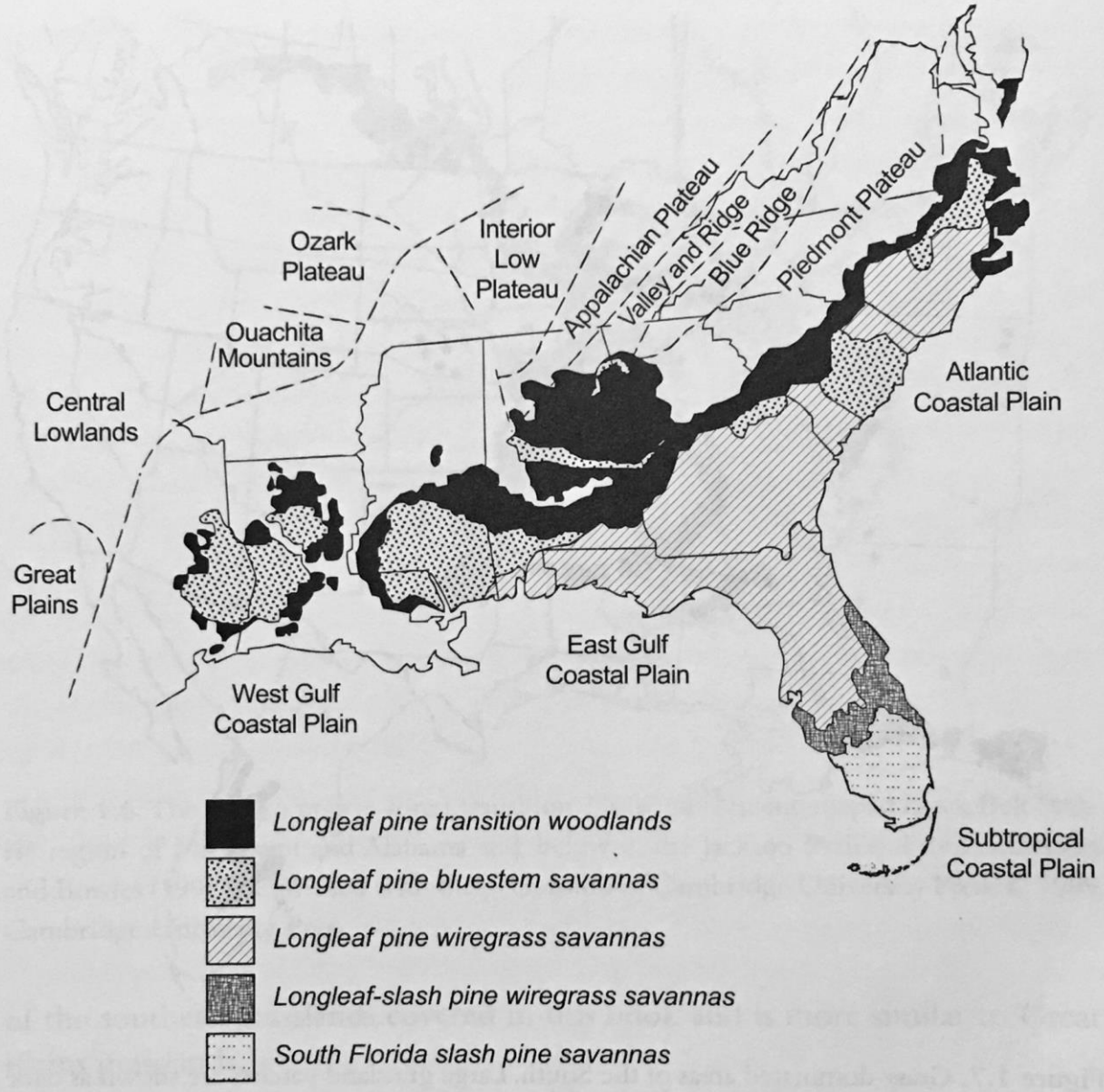


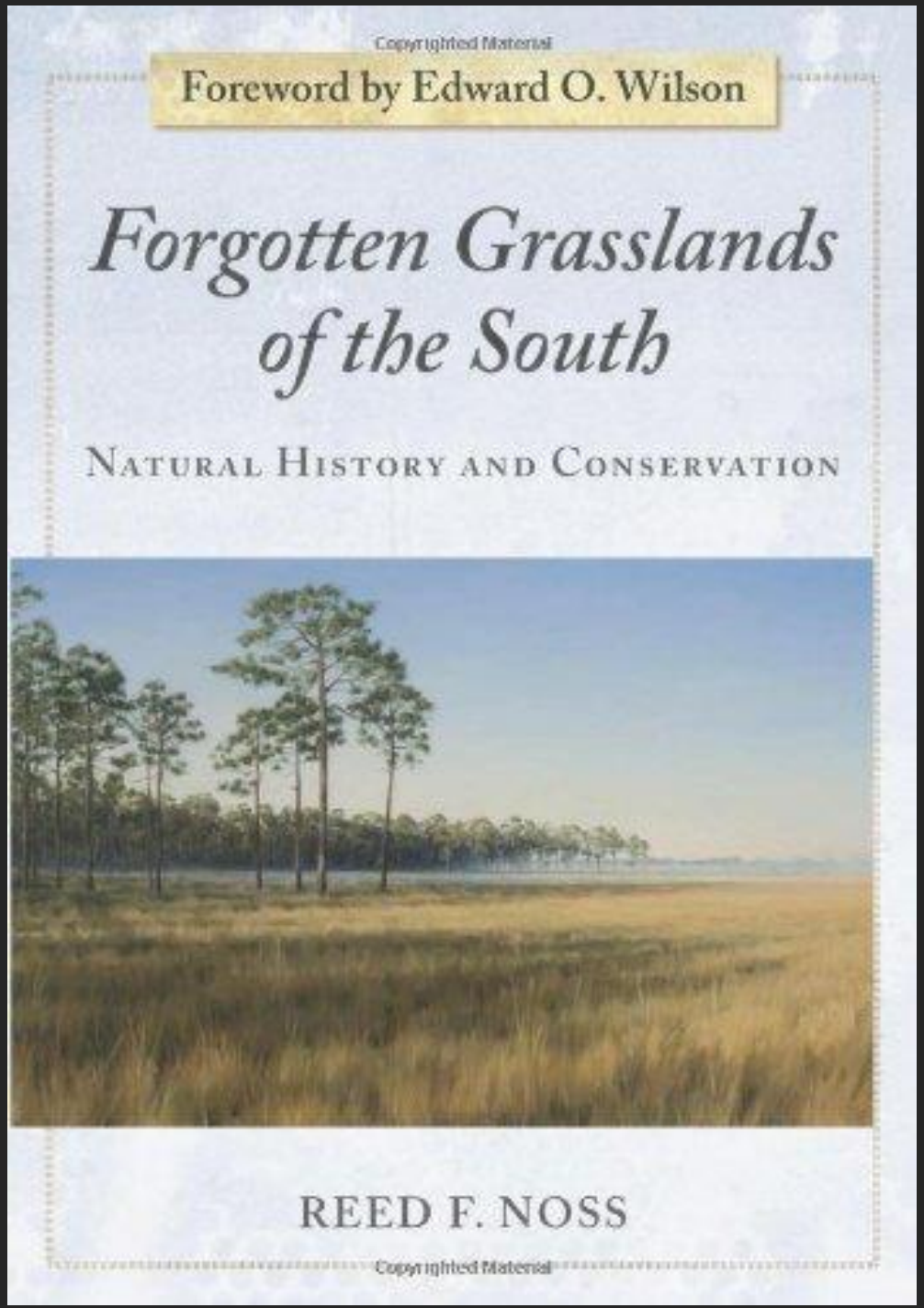
Figure 1.8. Distribution of pine savanna and woodland types in the southeastern United States. These communities formed the matrix vegetation across the Coastal Plain. Adapted from Platt (1999).

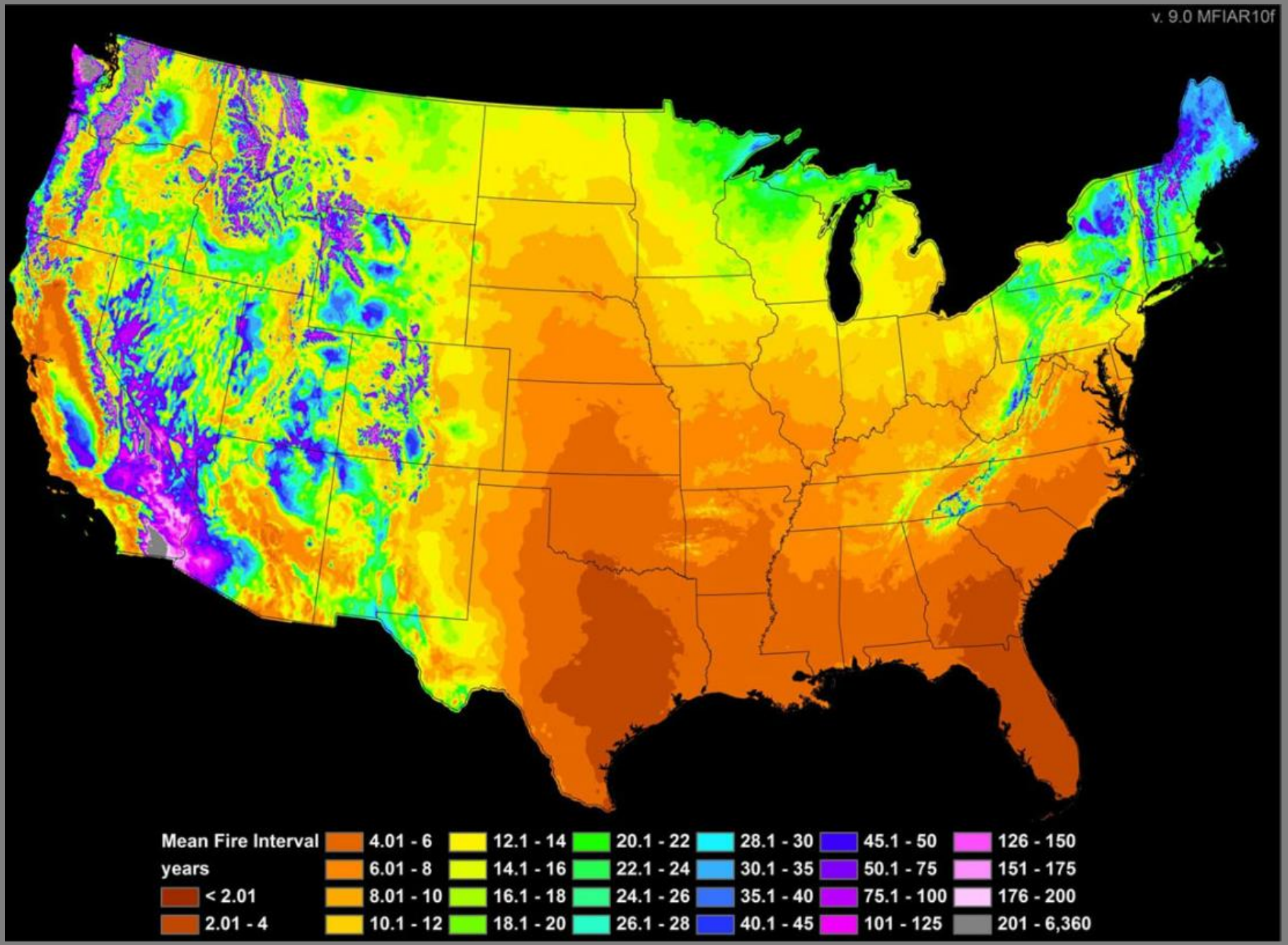
Noss 2013. Forgotten Grasslands of the South.

"… it is crucial to appreciate that longleaf pine ecosystems are forests to only a handful of species, but they are, or were, grasslands."
--Bruce Means

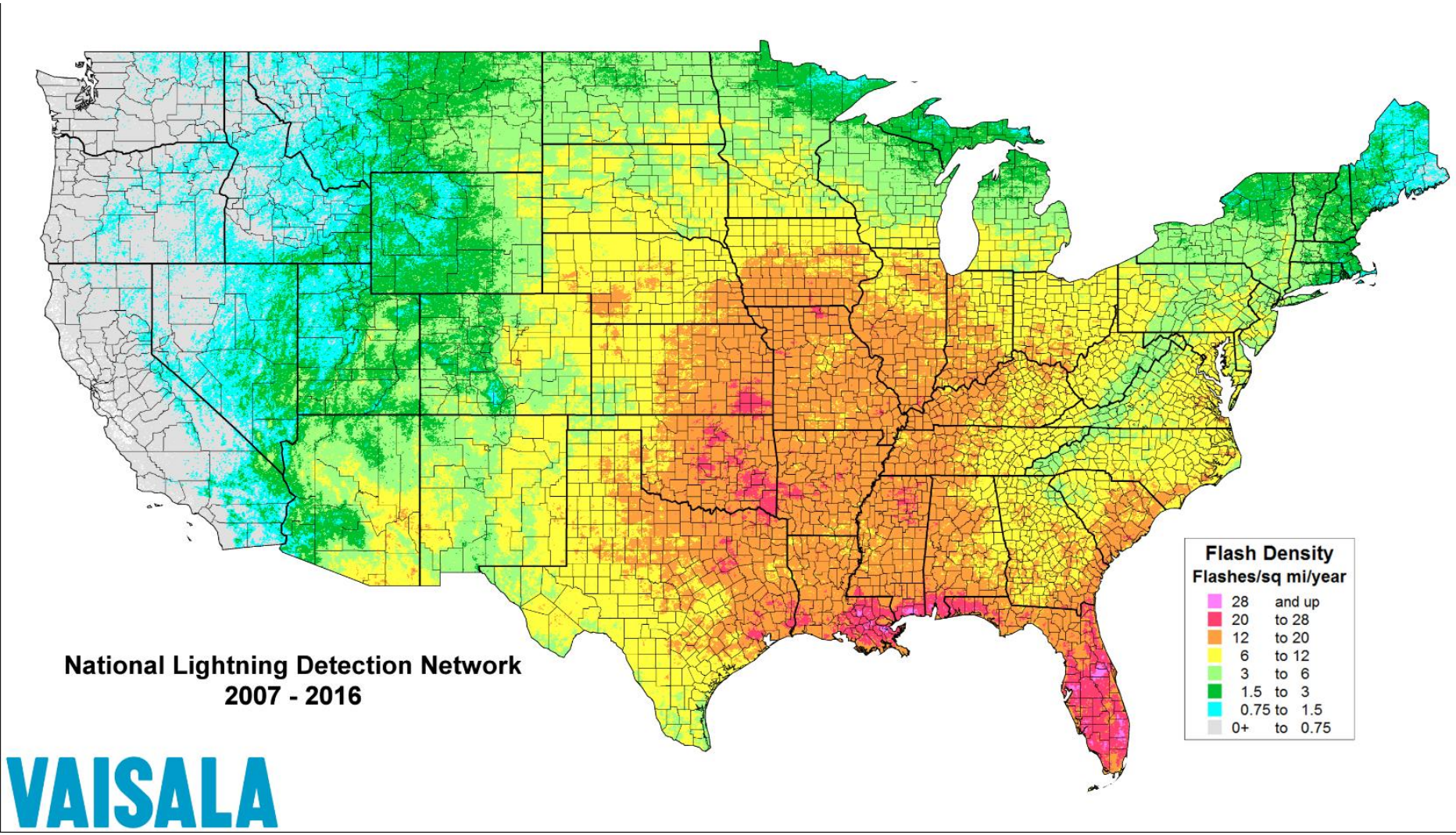
"Pyrogenic grasslands"
-- Susan Carr

"It must be kept in mind that the presence of grassland… may not reflect not only the climate… but also the topography, soil characteristics, the fire history, grazing pressure, human activity, and perhaps an element of chance." -- Earle Ripley



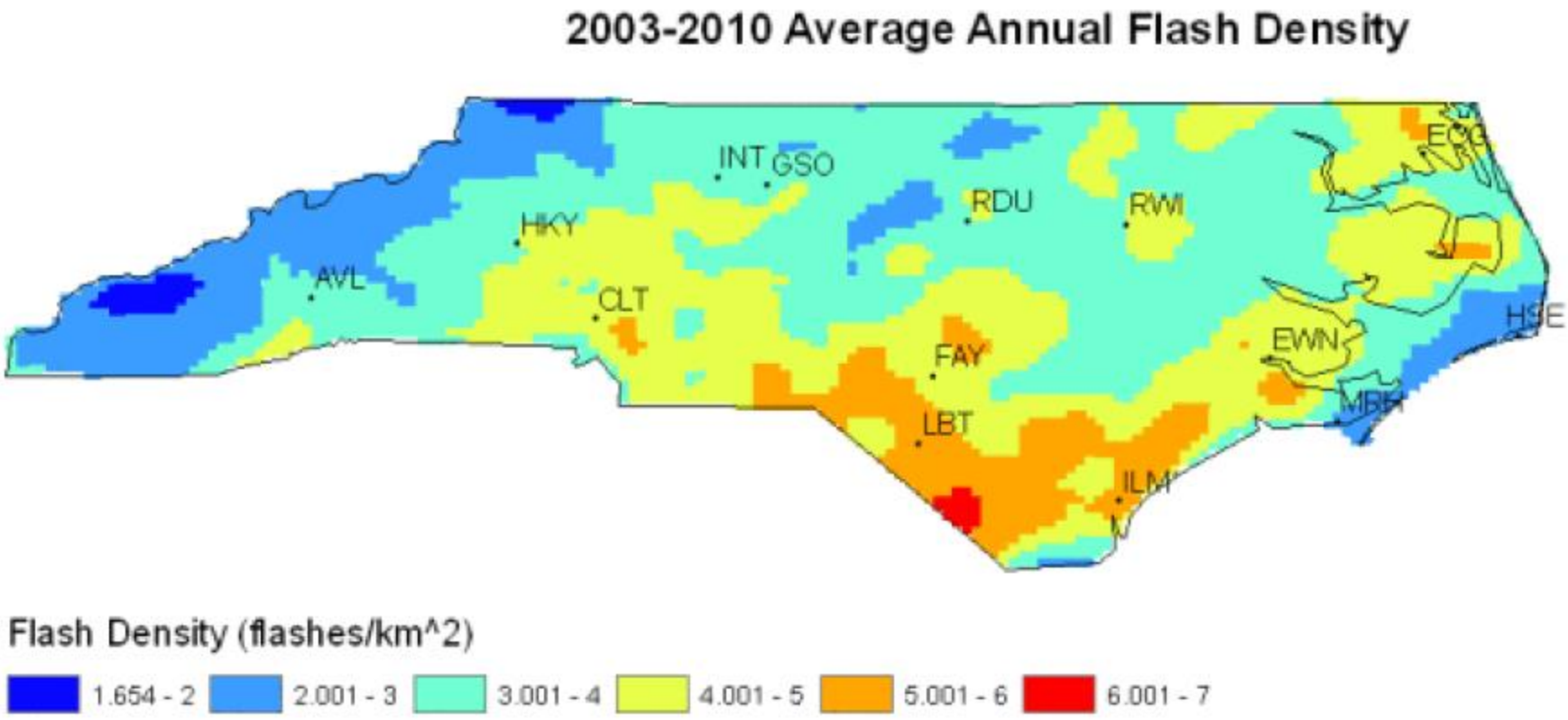


Guyette, Stambaugh, Dey, Musica 2012. Ecosystems



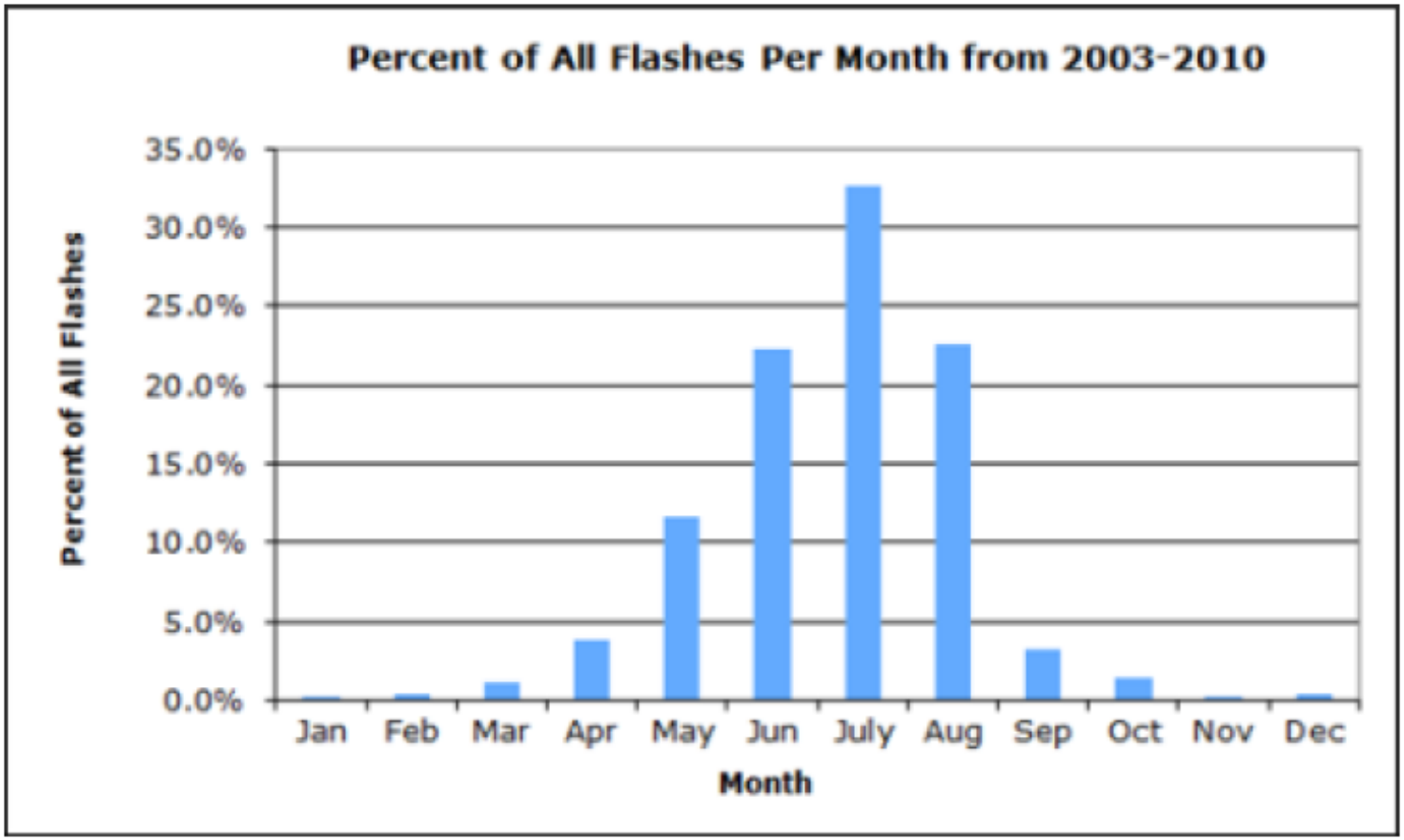
National Lightning Detection Network
2007 - 2016

VAISALA



2003-2010 average annual flash density in flashes/km2.

Blaes, 2014. An 8-year Lightning Climatology of NC



Percent of annual flashes that occur in a month.

Blaes, 2014. An 8-year Lightning Climatology of NC

http://on-wa.rsabroker.ca.prod2.rsabase.com/news/broker-news/wildfire-season-gets-climate-smart-1

SPECIES RICHNESS OF SEVEN CLASSIC GENERA OF FIRE-MAINTAINED GRASSLANDS

	PRAIRIE REGION (Great Plains and Midwest)	SOUTHEAST
Andropogon (big bluestems)	2 spp.	**6 spp. in KY and TN** 11 spp. in Louisiana 16 spp. in North Carolina **19 spp. in Florida**
Sorghastrum (Indiangrasses)	1 sp.	**2 spp. in KY and TN** **4 spp. in Southeast**
Schizachyrium (little bluestems)	1 sp.	**1 spp. in KY and TN** 3 spp. in North Carolina 5 spp. in Louisiana **10 spp. in Florida**
Liatris (blazing-stars)	10 spp.	**11 spp. in KY & TN** 5 spp. in Louisiana 12 spp. in North Carolina **14 spp. in Florida**
Echinacea (coneflowers)	3 spp.	**4 spp. in KY & TN** 9 spp. in Southeast
Baptisia (wild indigos)	5 spp.	**7 spp. in KY & TN** 5 spp. in LA 6 spp. in NC **11 spp. in FL**
Helianthus (sunflowers)	14 spp.	**19 spp. in KY & TN** 19 spp. in LA 21 spp. in NC **19 spp. In FL**

(Alan Weakly, Univ. of North Carolina Herbarium)

U.S. Fish & Wildlife Service

Endangered Species, Threatened Species,Federal Species of Concern, and Candidate Species,

Moore County, North Carolina

Updated: 12-26-2012

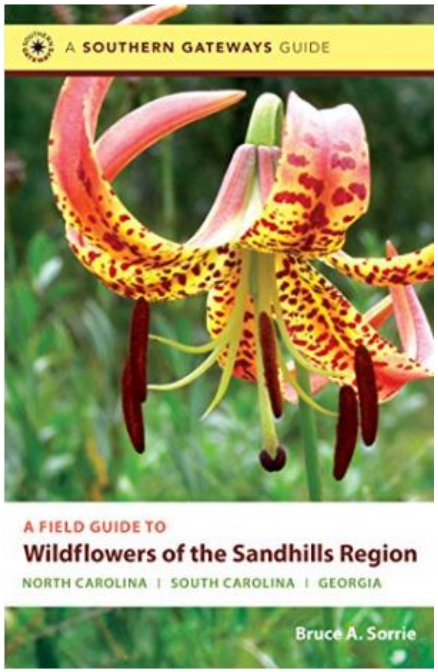
Common Name	Scientific name	Federal Status	Record Status
Vertebrate:			
American eel	*Anguilla rostrata*	FSC	Current
Bachman's sparrow	*Aimophila aestivalis*	FSC	Current
Cape Fear shiner	*Notropis mekistocholas*	E	Current
Carolina darter	*Etheostoma collis collis*	FSC	Current
Carolina darter	*Etheostoma collis lepidinion*	FSC	Current
Carolina redhorse	*Moxostoma* sp. *2*	FSC	Current
Northern pine snake	*Pituophis melanoleucus melanoleucus*	FSC	Current
Pinewoods darter	*Etheostoma mariae*	FSC	Current
Red-cockaded woodpecker	*Picoides borealis*	E	Current
Roanoke bass	*Ambloplites cavifrons*	FSC	Current
Sandhills chub	*Semotilus lumbee*	FSC	Current
Southeastern myotis	*Myotis austroriparius*	FSC	Current
Southern hognose snake	*Heterodon simus*	FSC	Current
Invertebrate:			
Atlantic pigtoe	*Fusconaia masoni*	FSC	Current
Brook floater	*Alasmidonta varicosa*	FSC	Current
Carolina creekshell	*Villosa vaughaniana*	FSC	Current
Eastern beard grass skipper	*Atrytone arogos arogos*	FSC	Historic
Septima's clubtail	*Gomphus septima*	FSC	Obscure
Yellow lampmussel	*Lampsilis cariosa*	FSC	Current
Vascular Plant:			
American chaffseed	*Schwalbea americana*	E	Current
Bog oatgrass	*Danthonia epilis*	FSC	Current
Bog spicebush	*Lindera subcoriacea*	FSC	Current
Buttercup phacelia	*Phacelia covillei*	FSC	Current
Georgia lead-plant	*Amorpha georgiana* var. *georgiana*	FSC	Current
Hairy-peduncled beakrush	*Rhynchospora crinipes*	FSC	Current
Michaux's sumac	*Rhus michauxii*	E	Current
Pickering's dawnflower	*Stylisma pickeringii* var. *pickeringii*	FSC	Current
Prairie birdsfoot-trefoil	*Lotus unifoliolatus* var. *helleri*	FSC	Current
Roughleaf yellow-eyed grass	*Xyris scabrifolia*	FSC	Current
Sandhills bog lily	*Lilium pyrophilum*	FSC	Current
Sandhills milk-vetch	*Astragalus michauxii*	FSC	Current
Small-leaved meadow-rue	*Thalictrum macrostylum*	FSC	Current
Spring-flowering goldenrod	*Solidago verna*	FSC	Current
Sun-facing coneflower	*Rudbeckia heliopsidis*	FSC	Historic
Venus' fly-trap	*Dionaea muscipula*	FSC	Historic
Well's sandhill pixie-moss	*Pyxidanthera barbulata* var. *brevifolia*	FSC	Current

Castanea 81(4):280-291. 2016
doi: http://dx.doi.org/10.2179/16-112

Canebrakes of the Sandhills Region of the Carolinas and Georgia: Fire History, Canebrake Area, and Species Frequency

Janet Bracey Gray, Bruce A. Sorrie, and Wade Wall

Received: December 11, 2015; **Accepted:** September 12, 2016



Some Additional Take-homes:

- Overall, “growing season” = more grasses and higher overall plant diversity
- Burn in different months w/ variation in the weather/fuel moisture conditions
- Don’t try to achieve all goals at once
  - Vary firing techniques employed
  - Burn into & even through ecotones and drainages when possible
- Safety comes first!



Thanks!

Sources of info for Sandhills Fire & Ecology:

Books

- Forgotten Grasslands of the South by Reed Noss
- A Field Guide to Wildflowers of the Sandhills Region by Bruce Sorrie

Papers

- Frost, Cecil 2000. *Studies in Landscape Fire Ecology and Presettlement Vegetation of the Southeastern United States*. Univ. of North Carolina Chapel Hill.
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- LeGrand Jr., Harry 2017. Butterflies of North Carolina, 24th approximation.
- Cox, J. and B. Widener 2008. Lightning-season Burning: Friend or Foe of Breeding Birds? Miscellaneous Pub 17, Tall Timbers Research Station, FL -- http://www.talltimbers.org/images/pubs/FireBreedingBirdsBooklet-small.pdf

Websites

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- North Carolina Native Plant Society -- http://www.ncwildflower.org/
- Butterlies of North Carolina – http://www.dpr.ncparks.gov/nbnc/index.html
- Biota of North America (BONAP) – http://bonap.net/NAPA/
- Amphibians and Reptiles of North Carolina -- http://herpsofnc.org/
- Southern Fire Exchange website -- http://southernfireexchange.org/
- Southern Fire Exchange YouTube channel -- https://www.youtube.com/user/SouthernFireExch/