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The Nature
Conservancy



Protecting nature. Preserving life.™

TNC-MD Controlled burn program: past, present, and why

Fire Ecology and Management in the Mid-Atlantic Coastal Plain Workshop
January 30, 2014, Salisbury, MD

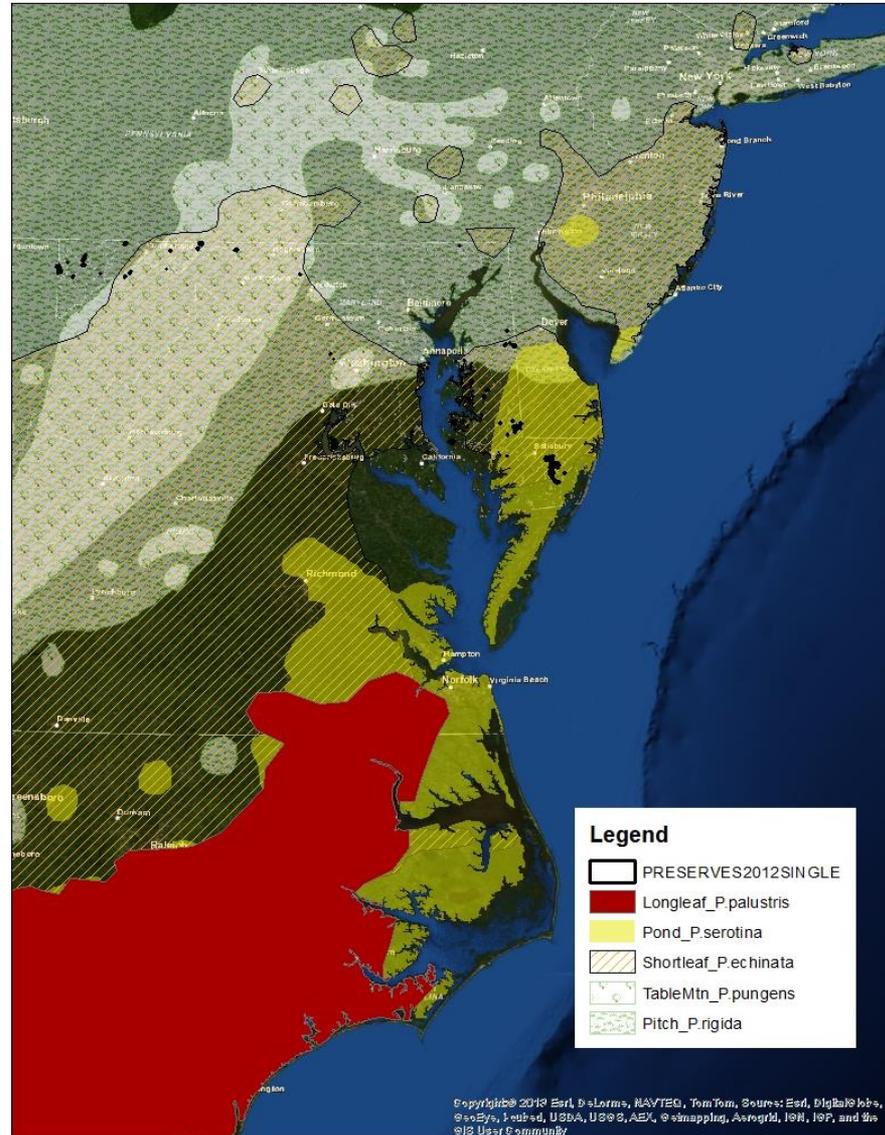
Deborah Landau, The Nature Conservancy



Chesapeake Bay - March 6, 2000 - MODIS/MODLAND/Desloires

Range maps for select fire-adapted eastern pines

Based on Elbert Little's 1971-1976 tree species range maps



“Typical” modern forest?



Herbaceous understory

20-40 species/acre

Tree density

300+ tree/acre

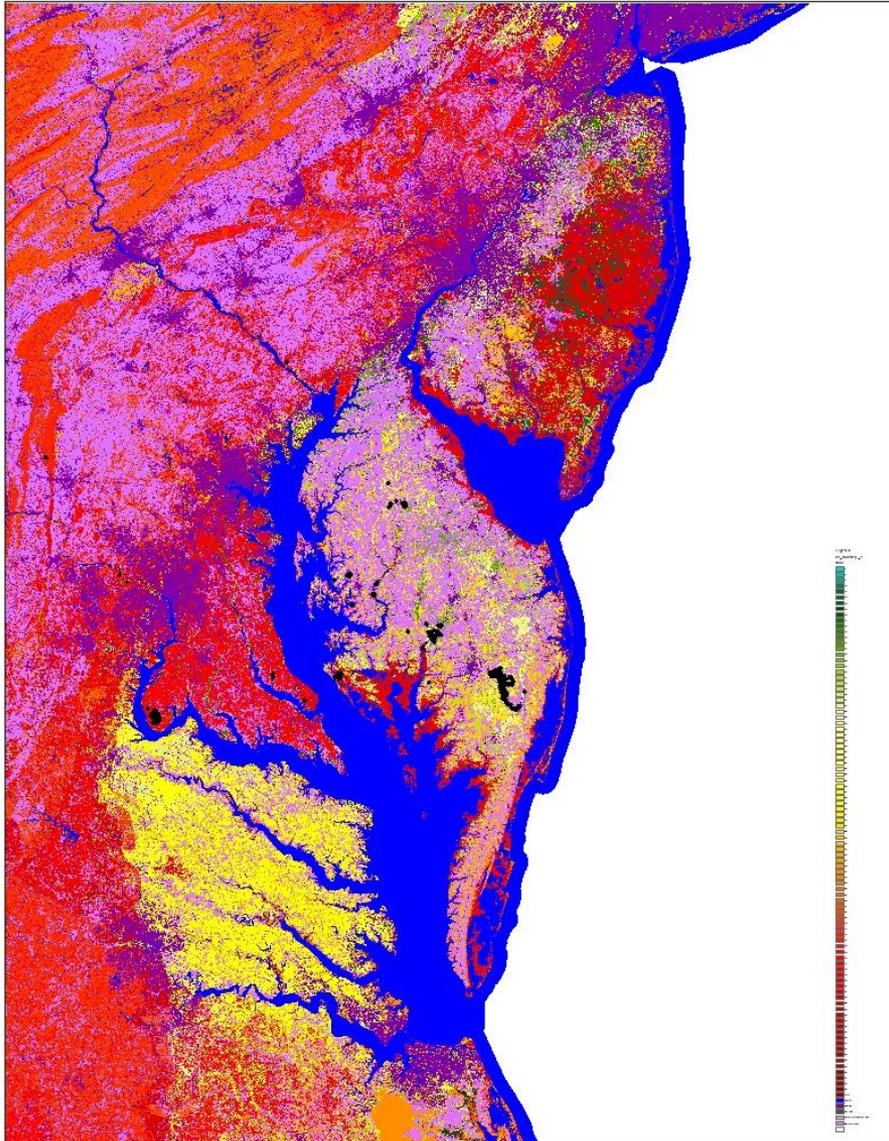
...or open and park-like?



Herbaceous diversity 100 - 150 species/ acre

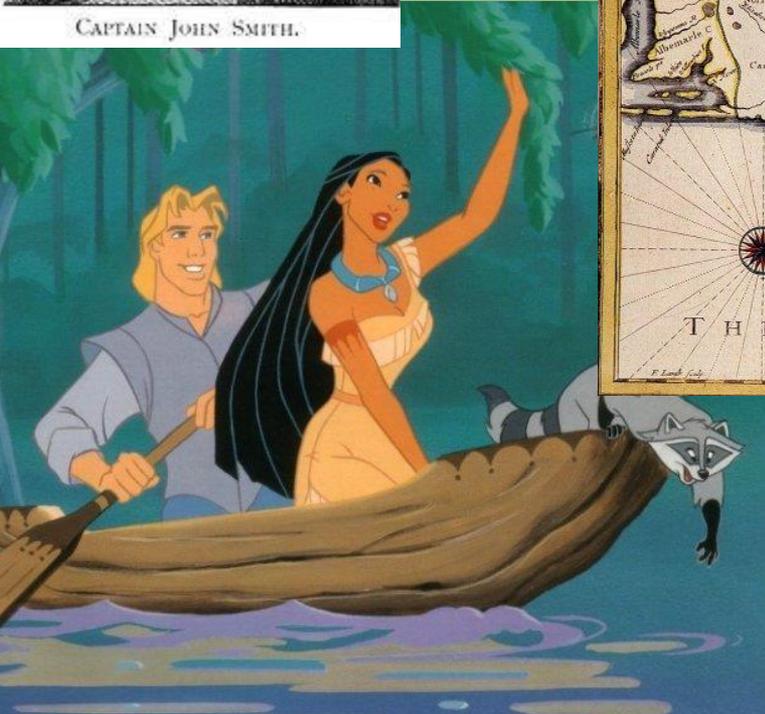
Tree density 38 - 76 trees/ acre

LANDFIRE vegetation departure (0-100)



- Depicts the amount current vegetation has departed from simulated historical vegetation reference conditions.
- Calculated based on changes to species composition, structural stage, and canopy closure
- LANDFIRE simulates historical vegetation reference conditions using the vegetation and disturbance dynamics model. Current vegetation conditions are derived from a classification of existing vegetation type, cover, and height.

We'll never really know what John Smith first saw (or what he really looked like)



But we do have written accounts of what he saw



"Having found the Deare, they environ them with many fires, and betwixt the fires they place themselves. And some take stands in the midst. The Deare being thus feared by the fires and their voices, they chace them so long within that circle that many times they kill 6,8, 10, or 15 at a hunting. When they have shot a Deare by land, they follow him like bloodhounds..."

-Captain John Smith describing fire hunting by Accawmacks (1580 - 1631)

Historical use of fire in Maryland

- Pre-(European) settlement fire frequency is estimated to have been 4-6 yrs in Dorchester, Wicomico, Worcester, Somerset Co's (Frost 1988), most likely set by Native Americans for herding game, enhancing visibility and access, slowing invasion of woody growth, creating more openings to attracted deer.
- Early settlers, including Capt. John Smith, describe open forests and park-like conditions. This could be due in part to mature forests with closed canopies, but periodic fires likely played a role as well.
- Pre-settlement fires may have maintained oak forests as well as conifer; "Light, understory fires may have been the norm for millions of hectares of eastern hardwood forest..." (Frost 1988). Most oak species are relatively shade intolerant, suggesting disturbance is desirable to promote regeneration and growth. Acorn germination and seedling establishment are most successful where light understory burns have scarified the seedbed and reduced competition. The extensive presence of oaks on the Shore was an indicator that low-intensity understory fires were common (Carter 2010).

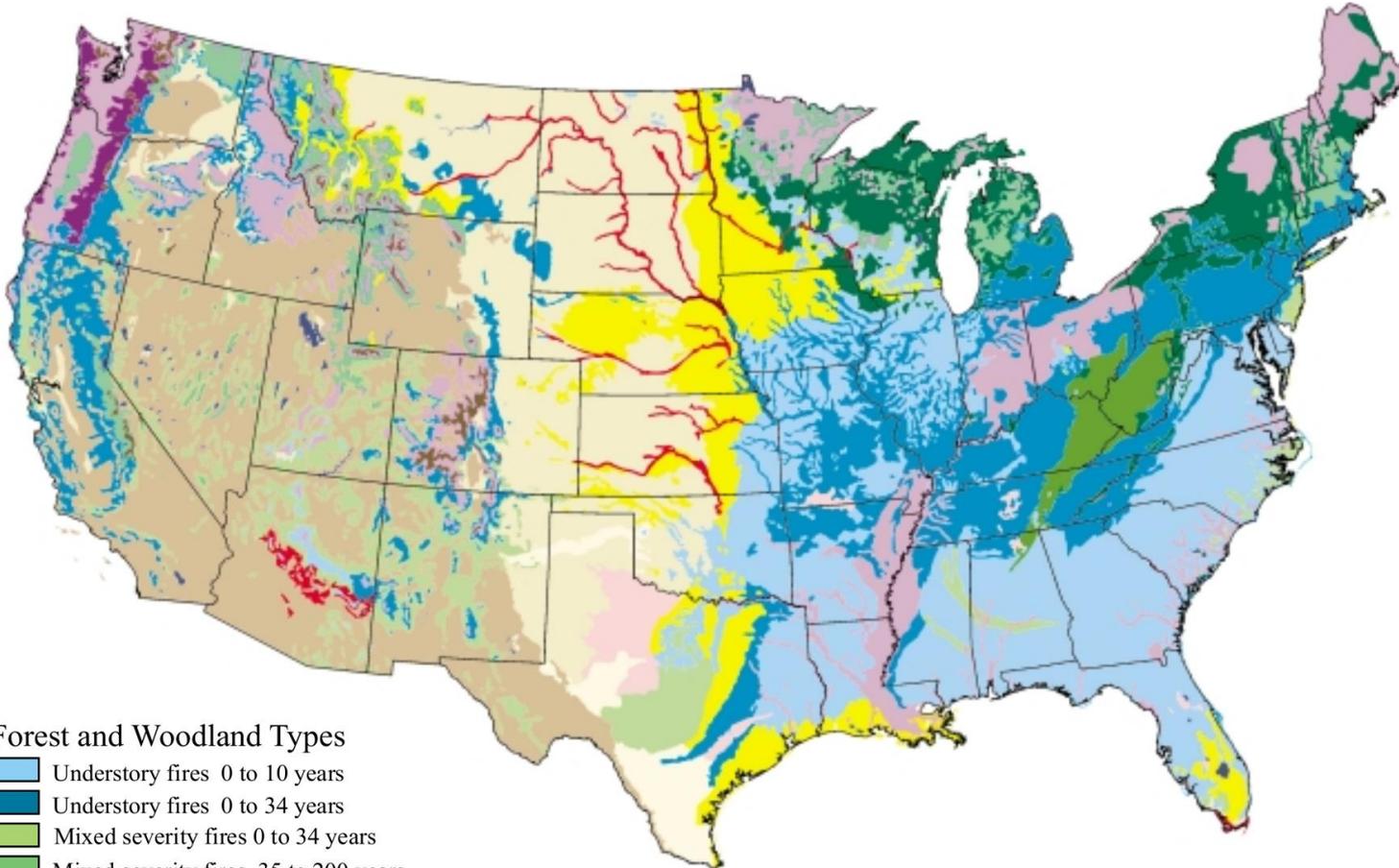
Post-settlement

- Even after Native Americans were displaced, 17th & 18th Century settlers continued using fire to clear land for housing and farming, to drive game, facilitate trapping, clear undergrowth for horse travel, improve foraging for free-ranging hogs, and even clear the woods of ticks (Carter 2010).
- In the 19th and early 20th centuries, the character of fire changed dramatically. Timber operations shifted from local to large-scale; with it came large amounts of residual slash on the ground and steam engines used to haul the logs. Result: a period of intense wildfire activity, helping drive state and local governments to develop aggressive fire suppression programs (Pyne 1982).



Fire regime types based on potential natural vegetation types

Brown, James K.; Smith, Jane Kapler 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: USFS, Rocky Mountain Research Station. 257 p.



Forest and Woodland Types

-  Understory fires 0 to 10 years
-  Understory fires 0 to 34 years
-  Mixed severity fires 0 to 34 years
-  Mixed severity fires 35 to 200 years
-  Mixed severity fires 201 to 500 years
-  Mixed severity fires 500+ years
-  Stand replacement fires 0 to 34 years
-  Stand replacement fires 35 to 200 years
-  Stand replacement fires 201 to 500 years
-  Stand replacement fires 500+ years

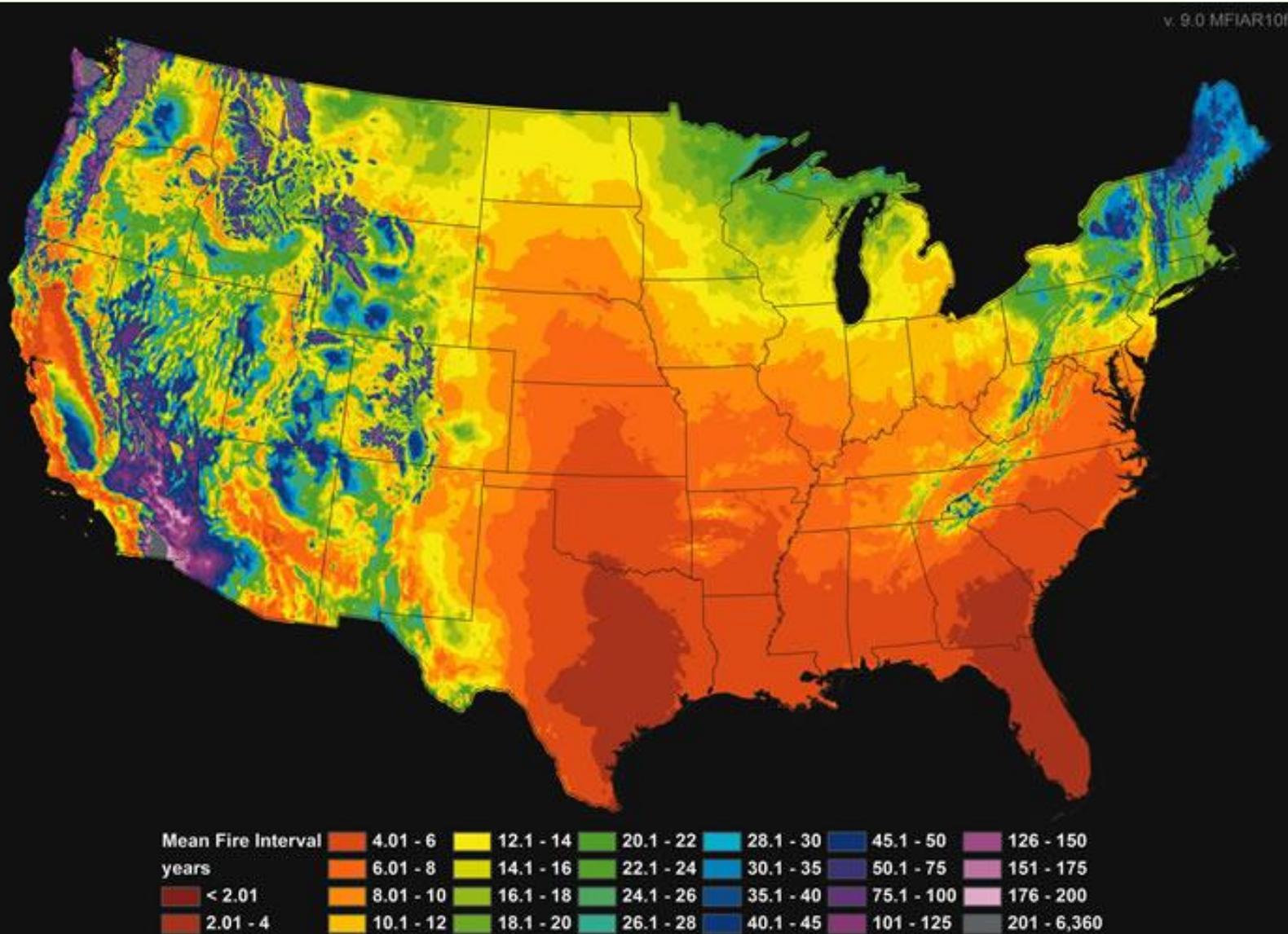
Grass and Shrub Types

-  Mixed severity fires 0 to 34 years
-  Stand replacement fires 0 to 10 years
-  Stand replacement fires 0 to 34 years
-  Stand replacement fires 35 to 100 years
-  Stand replacement fires 101 to 500 years

- Other**
-  Water

Historic (1650-1850) MFI estimates

Guyette et al. 2012, Predicting Fire Frequency with Chemistry and Climate, Ecosystems 15:322-335

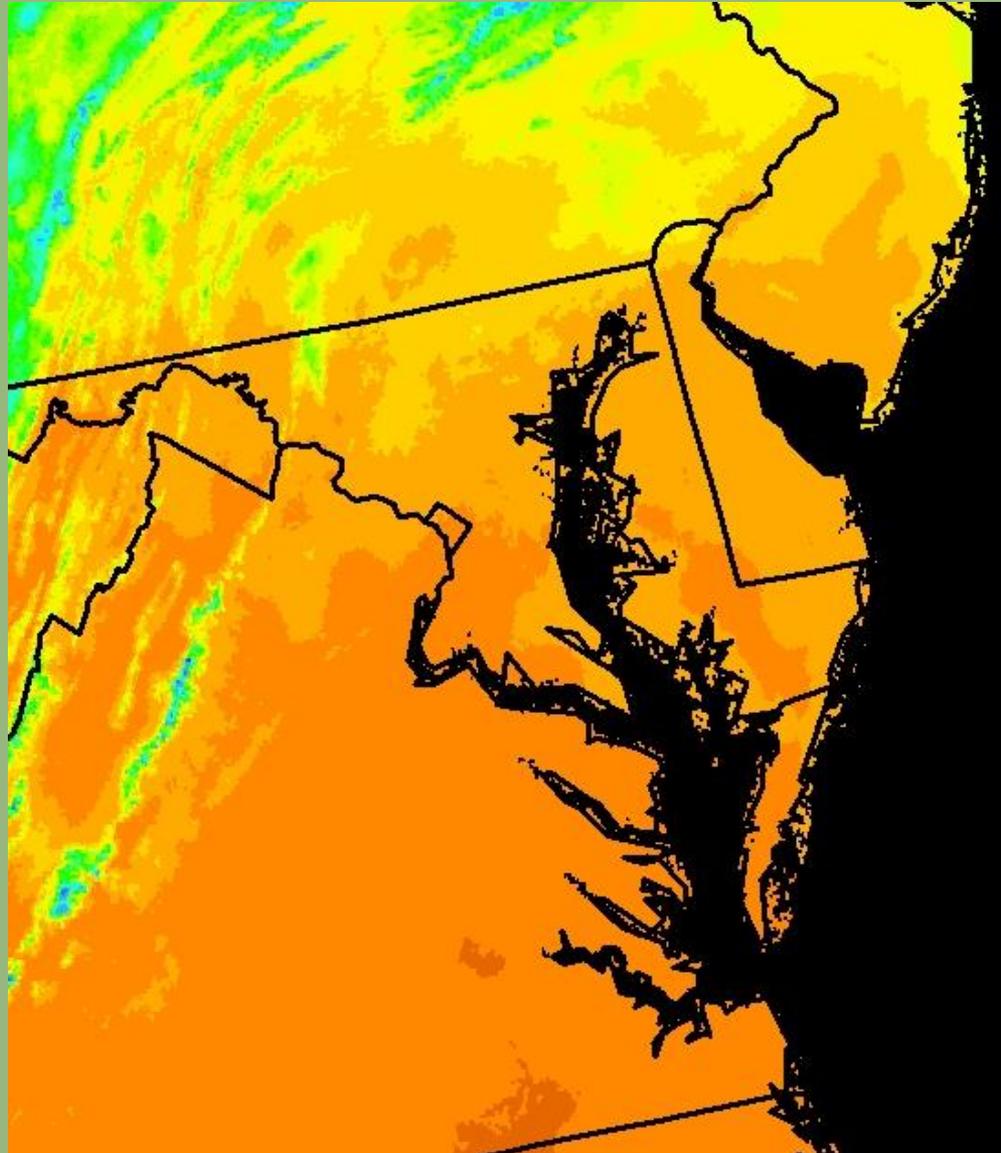


Model based on chemistry and fire history:

- °C
- ppt
- O₂

Tested against observed fire frequency

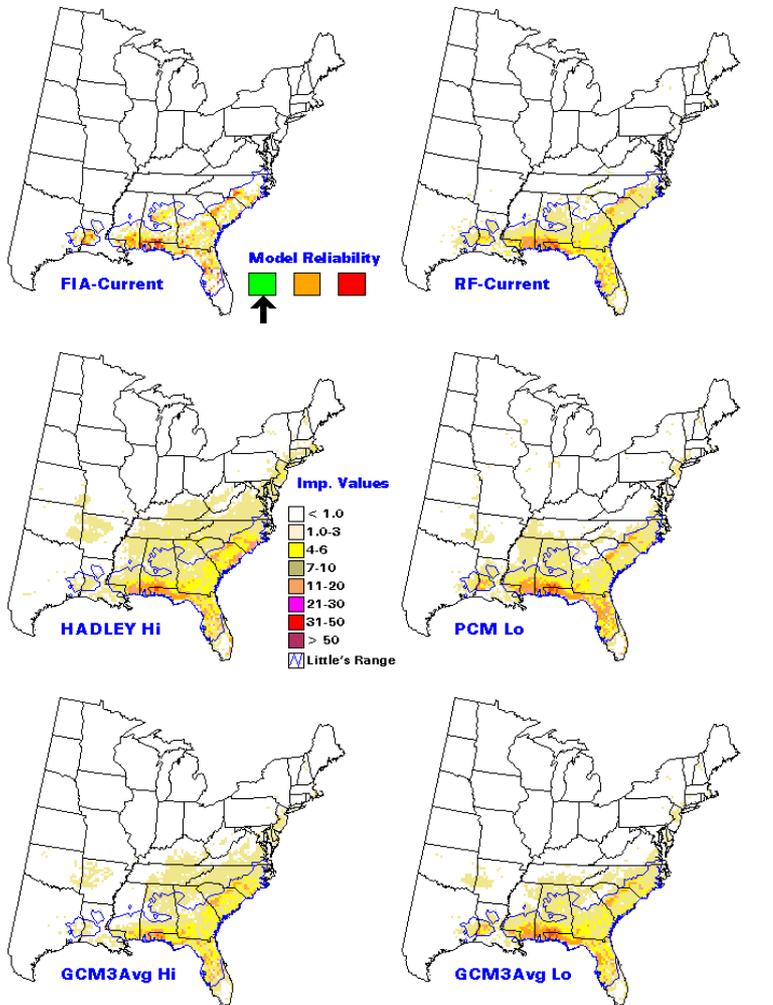
Guyette model - Delmarva



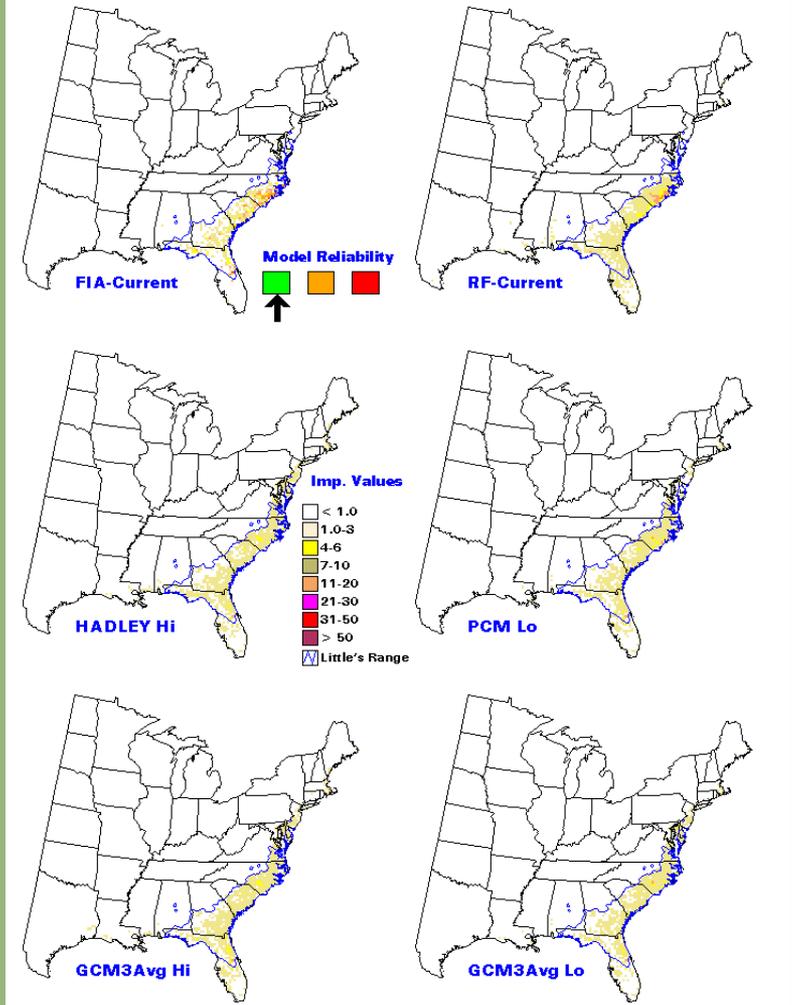
Range and FIA Distribution Maps

Prasad, A. M. and L. R. Iverson. 2003. Little's range and FIA importance value database for 135 eastern US tree species. Northeastern Research Station, USDA Forest Service, Delaware, Ohio.

longleaf pine - *Pinus palustris* - (121)



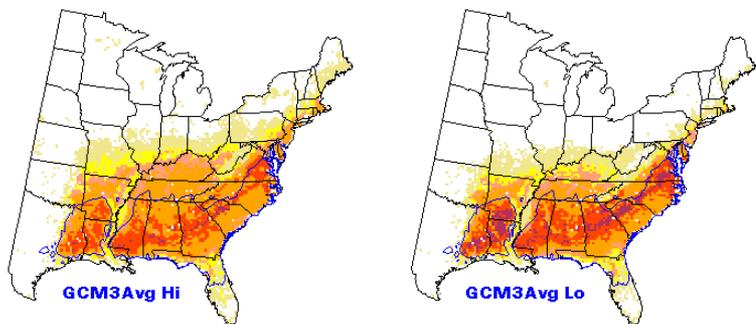
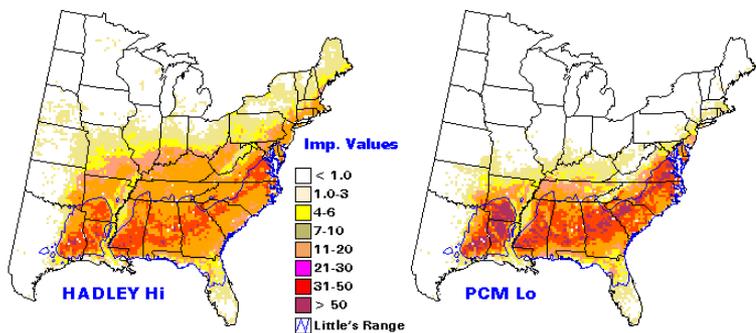
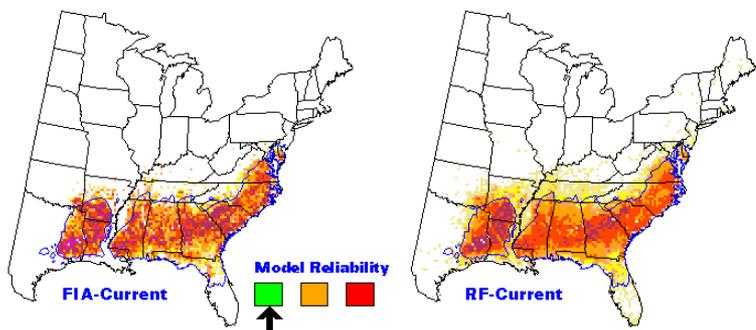
pond pine - *Pinus serotina* - (128)



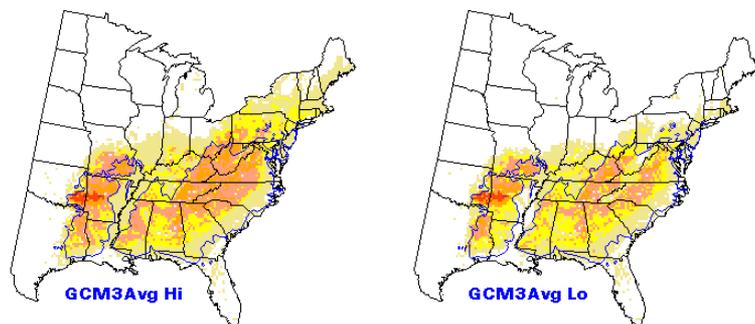
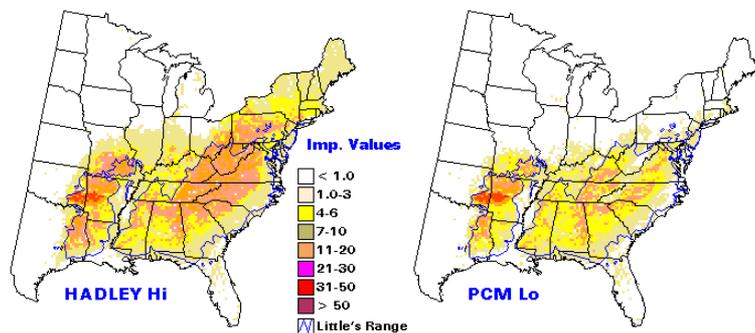
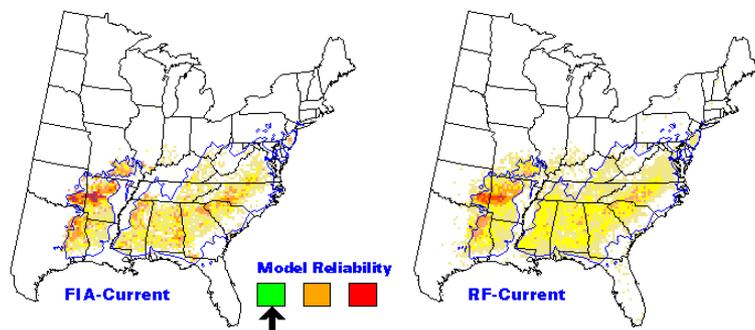
Range and FIA Distribution Maps con't

Prasad, A. M. and L. R. Iverson. 2003. Little's range and FIA importance value database for 135 eastern US tree species. Northeastern Research Station, USDA Forest Service, Delaware, Ohio.

loblolly pine - *Pinus taeda* - (131)

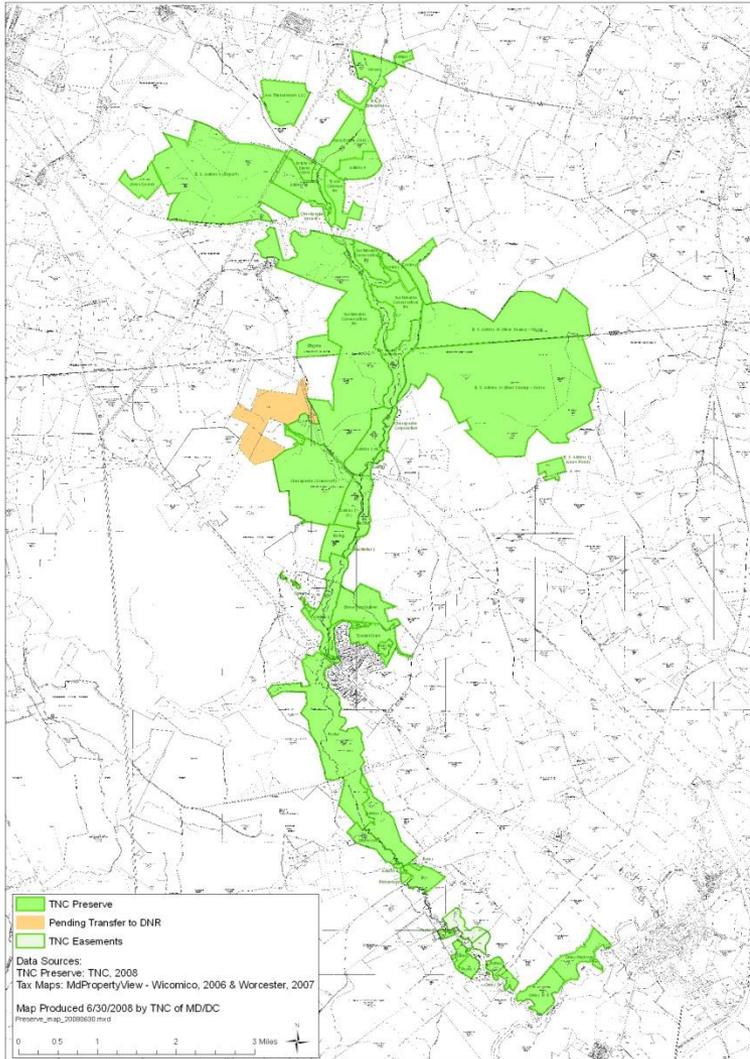


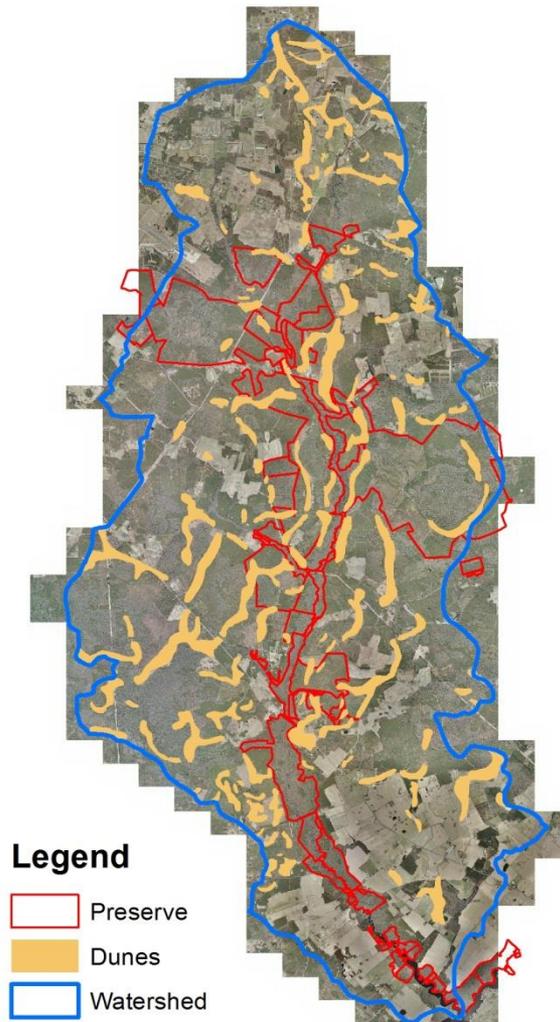
shortleaf pine - *Pinus echinata* - (110)



Nassawango Creek Preserve

Nassawango Creek Preserve





Legend

-  Preserve
-  Dunes
-  Watershed

Q: What's MD's fire regime?
A: Good question



Timber management



Atlantic white cedar site prep



Serpentine barrens/ grasslands



Cypress swamp? (not likely)

Nassawango Burn Plan

Prescribed Fire Plan for Nassawango Creek Preserve March 2013

PRESCRIBED FIRE PLAN

State: Maryland
Preserve: Nassawango Creek Preserve
Unit(s): Thinned pine stands >25 yrs old (Red Units)
 Young pine stands or open fields <25 yrs old (Yellow Units)
 Mixed pine/hardwood stands (Blue Units)
Dates: All (Dormant and Growing Seasons)

Maryland/DC Chapter of The Nature Conservancy

Fire Planner(s):	
Name: Gabe Cahalan	Signature:
Title: Land Steward	Date:
Name: Deborah Landau	Signature:
Title: Conservation Ecologist	Date:
Technical Review:	
Name: Art Canterbury	Signature:
Title: FMO USFWS Blackwater Refuge	Date:
Fire Manager:	
Name: Sam Lindblom	Signature:
Title: Fire Manager-TNCVA/GA/MD	Date:
Regional Fire Manager:	
Name: Chris Robertson	Signature:
Title: MD-DNR-FS Eastern Region Fire Manager	Date:

Disclaimer: The following prescribed burn unit plan (the "Plan") was prepared by or on behalf of the Nature Conservancy. To the extent the Conservancy has authorized a third party to use this Plan, the authorization is explicitly limited to the prescription set forth in the Plan. In addition, use of the Plan is not authorized if the Conservancy gives verbal or written indication that burning is not appropriate on any given day. Any use of this Plan is at the user's own risk. By using this Plan, the User agrees to indemnify and hold the Conservancy and its employees harmless from any injury or loss arising from the burn activities or use of the Plan.

OVERVIEW

Purpose

The intent of this Prescribed Fire Plan is to satisfy all planning requirements related to prescribed fire use using ground-based ignition at Nassawango Creek Preserve. **This document does not address planning of aerially ignited burns.** This planning document supersedes the February 2011 plan (Johnson Tract Plan).

Location

Nassawango Creek Preserve is the TNC-owned portion of the Nassawango forest block, an area with over 10,000 acres of pine-oak forest located in Wicomico & Worcester counties, Maryland (Figure 1). Ownership of the block is structured across two agencies (The Nature Conservancy, MD Department of Natural Resources). The state-owned property includes additional access routes and water sources; therefore it is included in Figure 1 and Figure 2.

Habitat Considerations

Nassawango Creek Preserve contains rare habitat types as well as rare and endangered species. Rare habitat types maintained by fire include xeric dunes and coastal plain bogs.

This Prescribed Burn Plan has been developed to facilitate reintroduction and continued application of fire at Nassawango Creek Preserve.



Property Overview

Figures 2a-d provide an overview of Nassawango Creek Preserve and adjacent Chesapeake and Pocomoke Forestlands (MD DNR). Primary and secondary vehicle access routes, water sources and gates are shown. For some portions of Nassawango Creek Preserve, the nearest vehicle access or water source may be on the adjacent MD DNR state property. Figure 3 depicts burn units at Nassawango Creek Preserve and identifies the major fuel types. The burn unit shapes may change as line is constructed and Figure 3 will be updated.

Prior to burning, an INDIVIDUAL BURN UNIT MAP, CONTINGENCY MAP and an Incident Action Plan (IAP) will be developed for each unit (these are not included for each unit here).

Smoke Screening

Figures 4a-d present short-range smoke screening targets for Nassawango Creek Preserve. Within 2-5 miles of the preserve, smoke sensitive targets include:

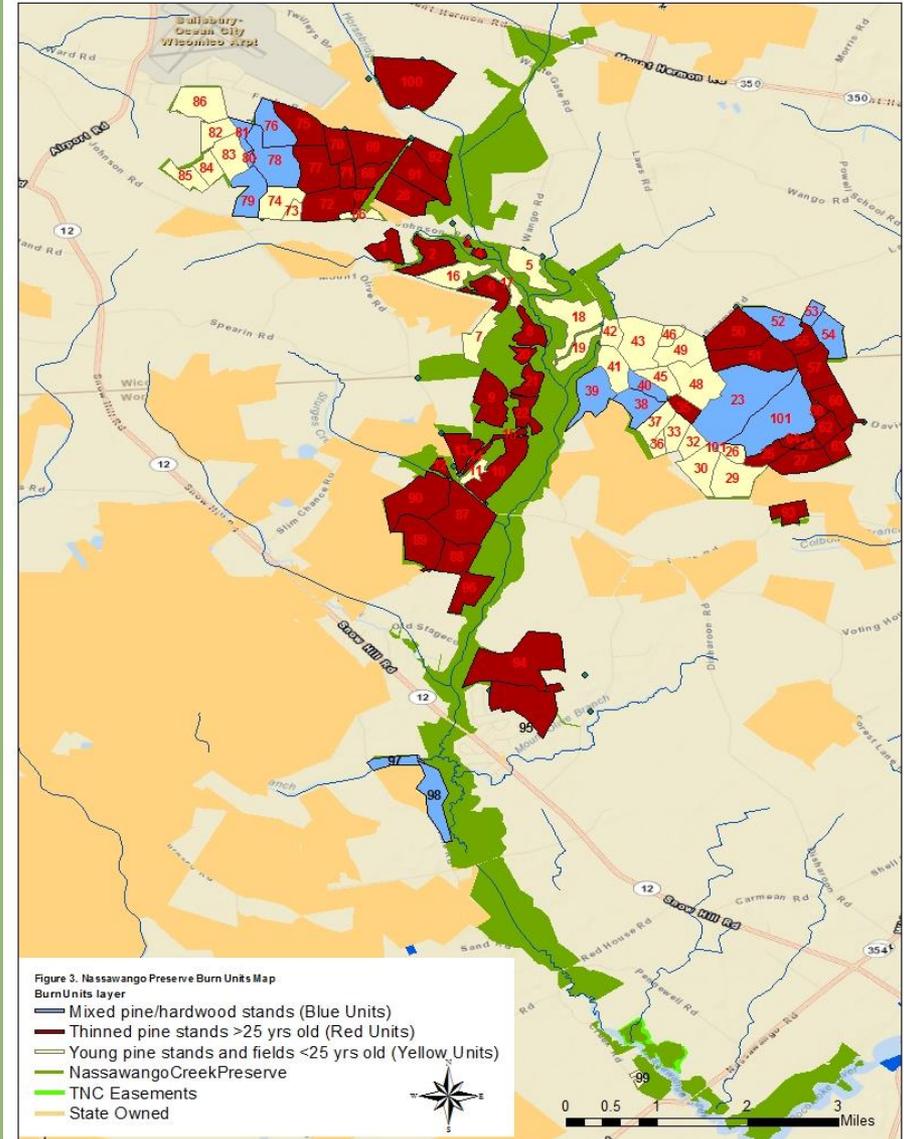
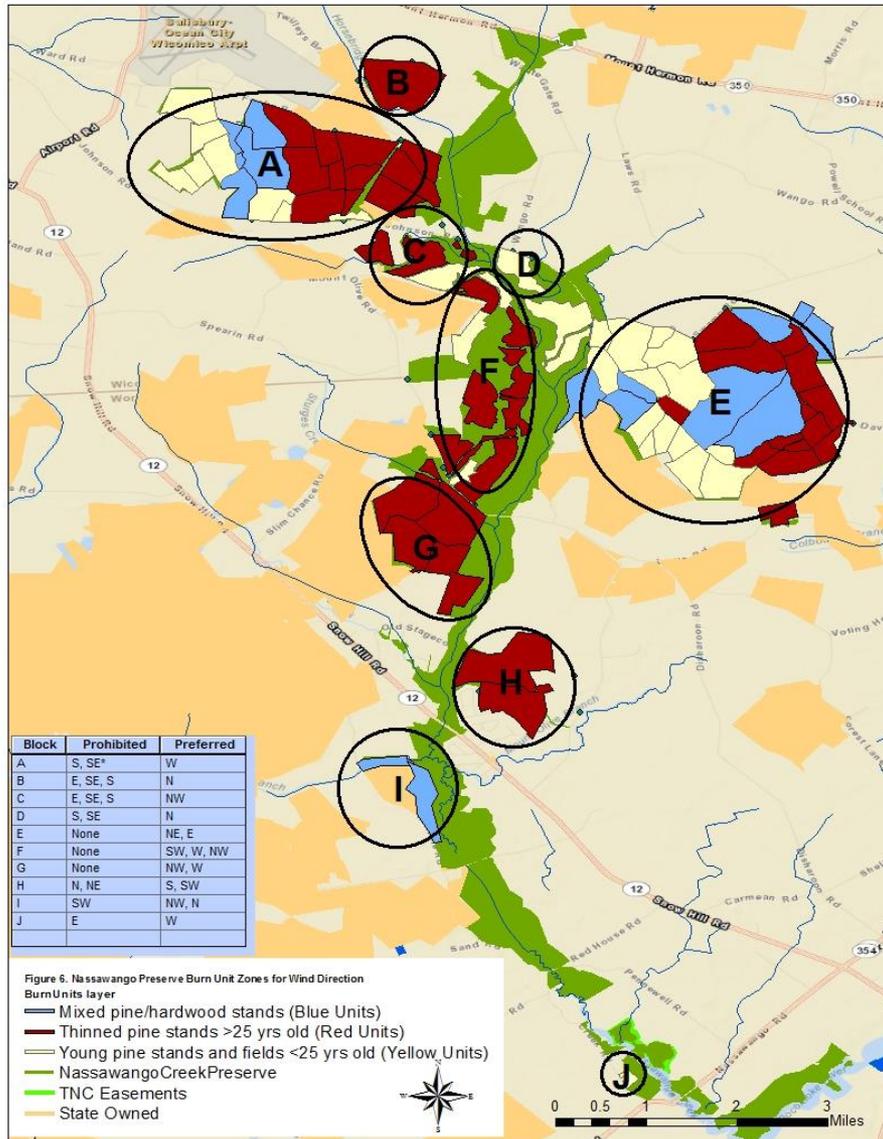
- Route 12 -two lane road bisects the preserve
- Route 50 -four lane highway 4 miles N
- Route 13-four lane highway 4 miles W
- City of Salisbury-part of the city falls within the 5 mile ring of the most NW part of the preserve.

Within 2 miles of Nassawango Creek Preserve, smoke screening targets include public roads near and adjacent to the preserve, nearby structures/residences, a small regional airport on the northern end, and the Town of Snow Hill at the southern end.

Medical Plan

Emergency medical response to Nassawango Creek Preserve will be initiated by contacting the Wicomico County Department of Emergency Services Center by dialing 911. The response agencies providing emergency medical service to Nassawango Creek Preserve are Parsonsburg Fire Department and EMS Station 6, located 7

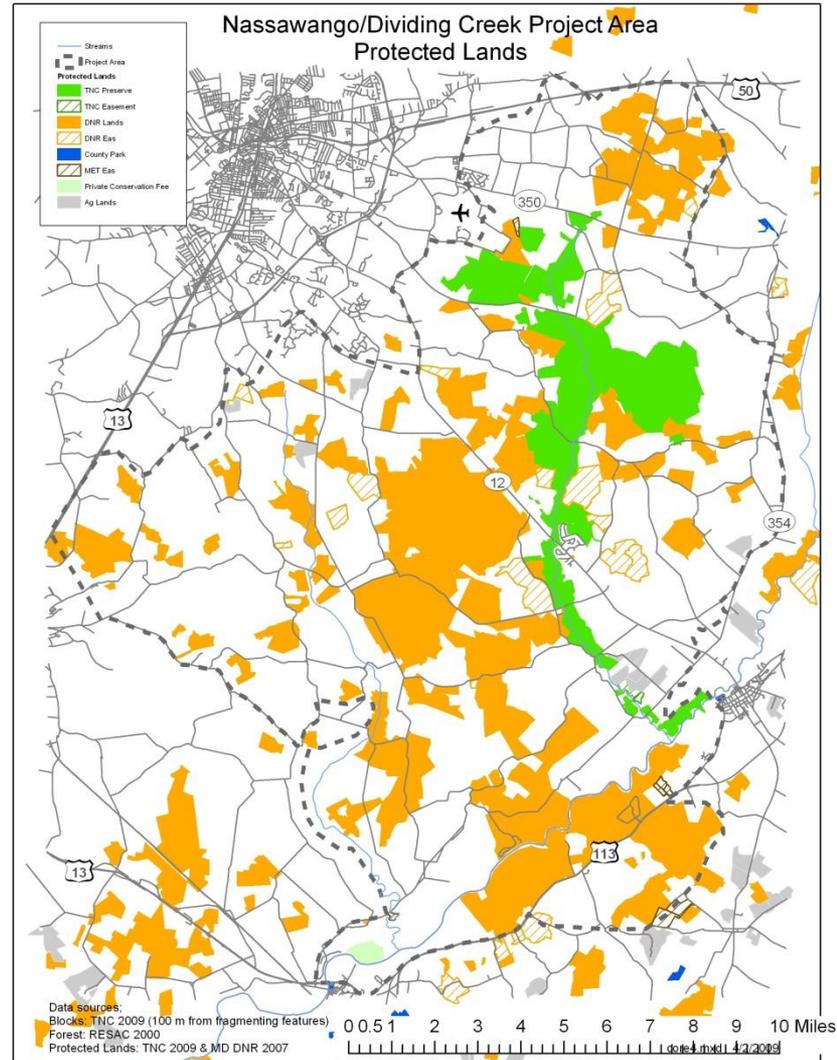
Wind direction zones and burn blocks



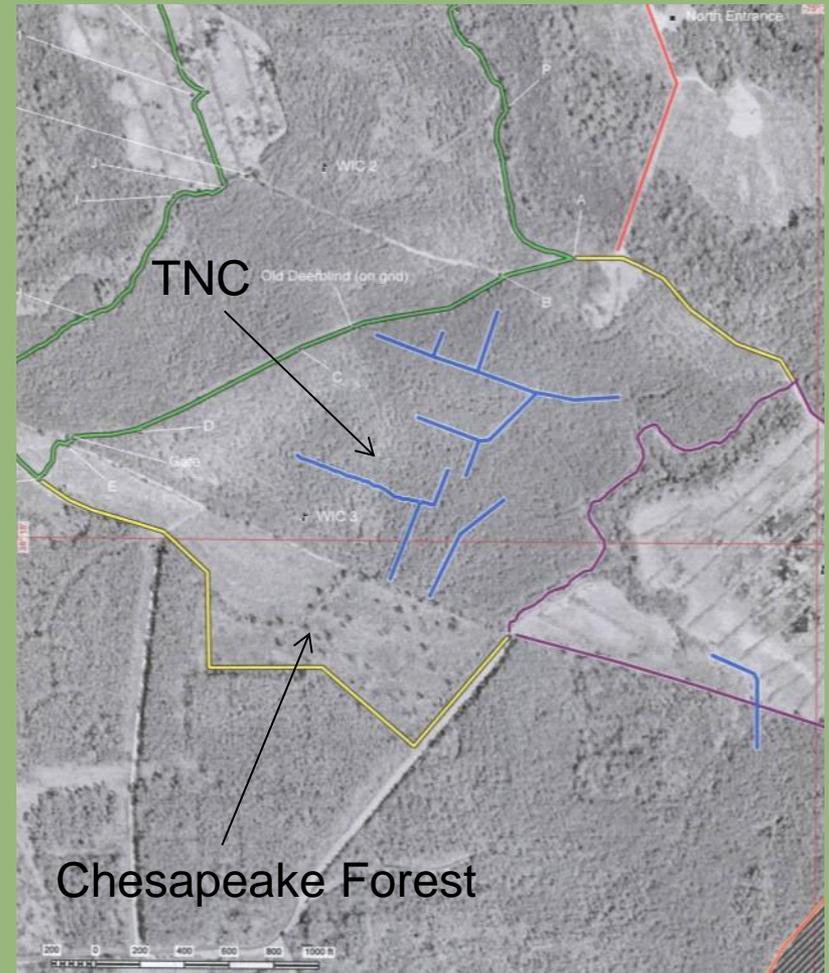
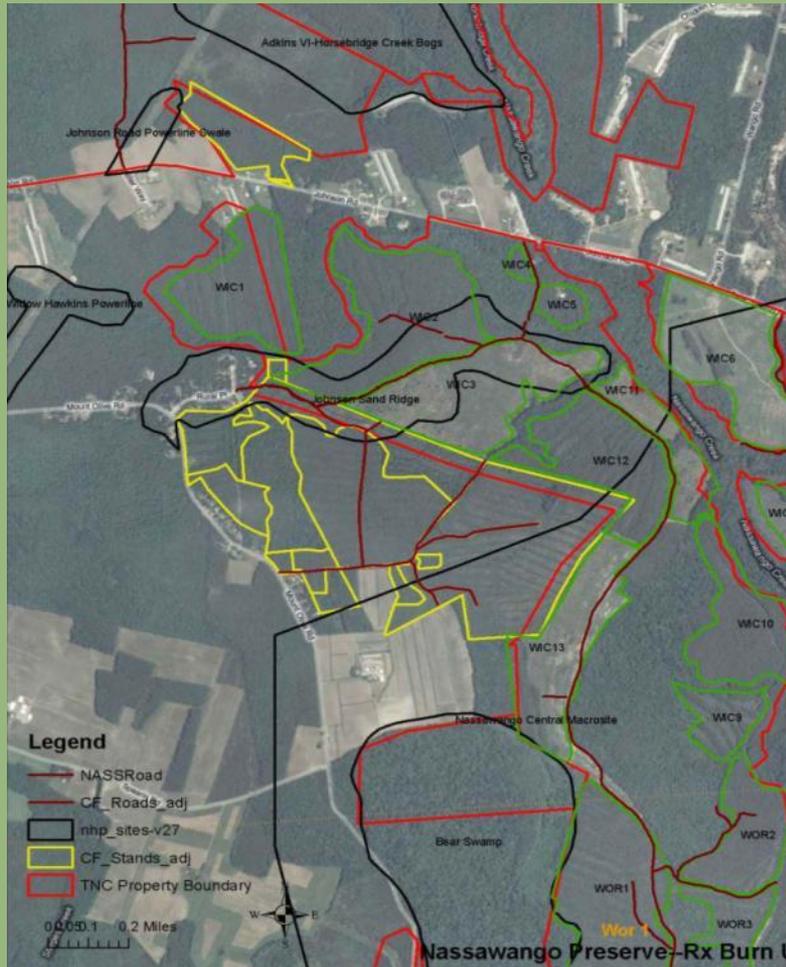
Burn off of existing roads when possible



Taking advantage of shared boundaries



Johnson Sand Ridge TNC/Forest Service burn



Post-burn management issues

- Windrows re-ignited during summer 2011 drought (though ended well)
- Invasives (*Lespedeza*)
- Gums & maples in wet areas
- AWC planting
- Orchid enthusiasts swarming to site after new find



Post-harvest responses



7 white-fringed orchid
(*Platanthera blephariglottis*)



yellow-crested orchid
(*Platanthera cristata*)

Post fire – even better



50+ white-fringed orchid
(*Platanthera blephariglottis*)



20 yellow-crested orchid
(*Platanthera cristata*)



3 *Platanthera X canbyi*

Equally exciting, if not as showy...



whip nutrush
(*Scleria triglomerata*)



Torrey's beakrush
(*Rhynchospora torreyana*)

Thank You

