

***Harvest Preferences**

	Clear cut	Shelter Wood	Group Selection	Single Tree	Uncut (>50)
Prairie Warbler	*****	**			
Common Yellow Throat	*****	***	*		
Indigo Bunting	****	***	**	*	
Red-eyed Vireo	*	**	*****	****	****
Hooded Warbler			**	**	*
Oven Bird		*	**	**	***

*From Annand and Thompson, JWM 61:159-171

Young Forests

- Early-succession habitat important
- **COVER**



Common Yellowthroat

Planting

- Plant at 10x10 spacing or greater
- Consider *longleaf pine* on the right site
 - tolerates fire at early age
 - grass stage is good cover
 - sparse crown that allows sunlight to reach forest floor

Mechanical Site-prep

- Sheering, root raking, burning, drum-chopping, disking & bedding
- Intensive temporarily favors herbaceous plants, reduces woody plants
- More intensive may reduce long term plant diversity



Chemical Site-prep

- Herbicides
- Short term (2 year) Impacts
- Banded or Spot application



Intermediate Stand Treatments



Thinned and Burned



Thinning Guidelines

- 70 ft²/acre basal area
- <50 ft²/acre for quail
- Higher BA on better sites
- Leave mast trees
- Avoid high grade



**Wildlife Benefits from
Thinning**

- Increased sunlight in understory
- Release mast producers
- Increase acorn production
- Leave snags
- THIN and BURN



Winter Burning



- Good cover summer after burn

- Poor cover following winter (hardwood sprouts)



- Sweetgum saplings don't provide winter cover
- Baseball easily seen at 10 foot distance



Nut and Fruit Production

- Release oaks with dominant crowns
 - 50-100 yr. oaks produce best
 - 14-24" DBH oaks produce best
 - water, laurel, willow oak most consistent
- 20 square feet/acre of mast producers
 - hickory, beech, dogwood, blackgum, cherry, persimmon, blueberry, blackberry



Recent History of Fire in SE

- Native Americans for last 12,000 years
 - drive or increase game
 - increase visibility from enemies
- Lightning fires in spring/summer
- Plants and animals adapted



Direct Death from Fire

- RARE
- Birds fly
- Large mammals run
- Small animals seek refuge
 - logs, rocks, & underground burrows
- Glass lizards, box turtles and young are exceptions



Shrubland Songbirds

- 3-4 year intervals
- Increased insect/seed/fruit production
- Brushy understory
 - ↓ midstory species



Grassland Songbirds

- 1-2 year intervals
- Increased grass abundance
- Grassy understory
 - ↓ shrub species
 - ↓ midstory species



Bobwhite Quail

- 1-2 year intervals; 3 year spots
- Increased seeds and insects
- Leave unburned areas as nesting cover
- Patchy burns
- Open pine stands (BA 25-50 ft²/ac.)

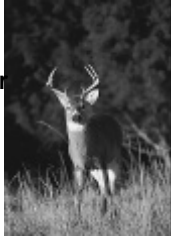
Wild Turkeys

- 3 year intervals
- Increased insect/seed
- Increased fruit abundance
- Maintains brushy & grassy ground cover
- Keeps forest open



White-tailed Deer

- 3-5 year intervals
- Increased crude protein and phosphorus for 1 year
- New growth palatable
- Increased soft and hard mast production
- Dense understory growth



Herbicides Replace Fire

- Industry choosing herbicides
- Liability, tree damage, and bark char
- Herbicides give better hardwood control
- Fire has additional benefits
 - litter removal/seedbed preparation
 - herbaceous plant diversity
 - nutrient transfer into soil

Herbicides & Wildlife

- Water soluble & not fat soluble
- Short term effects (<2 years)
- Minimize tank mixes
 - Arsenal promotes legumes/blackberries
 - Arsenal+Escort promotes little

Partridge Pea



Herbicides

- Banded or spot application during site prep
- Mid-rotation use of herbicides
 - Thin → herbicide → burn
- Used to control invasives, create snags, promote desirables, manage edges

Riparian Corridors

- High plant and food (Insects and acorns) diversity
- Natural travel corridors
- Sources of standing water
 - herp breeding areas
- Abundant dead wood
- High wildlife diversity



Management in SMZs

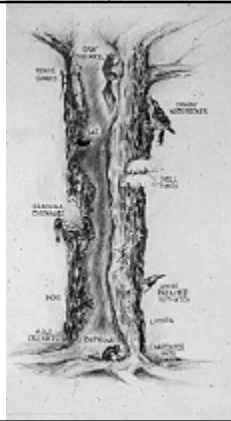
- Emphasize Desirable Hardwoods
 - oaks, ash, poplar
- Longer rotations (> 60 yrs)
- Group selection
- Maximize SMZ width

SMZ width

- Follow contour/normal floodplain
- ≥ 90 ft. wildlife - < 30 ft. streams
- ≥ 180 ft. wildlife - > 30 ft. streams
- ≥ 300 ft. specialized wildlife
- ≥ 1000 ft. large rivers

Snags

- Woodpeckers
- Secondary Users
- Roosting
- Feeding on insects
- Hibernating



***% Snags Standing**

Snag Age (Years)

	1	2	3	4	5	6
Lob Pine	100	64	37	20	5	4
Short Pine	100	64	42	24	13	5
Red Oaks	100	73	34	23	14	2
White Oaks	100	66	51	28	19	0
Y. Poplar	100	75	57	36	14	4
Snags w Cav.	1	1	3	7	8	35

*From Moorman et al. FEM 118:37-48

Snag Management

- SE short rotation pines have few usable snags
- Retain ≥ 4 snags or green trees/acre
- Softwoods preferred
- Clumped and $>12''$ dbh
- Periodically inject residuals

Clumping snags

- Buffer snags
- Support your neighbor
- Increased safety
- Easier management
- Distribute the clumps

Dead Wood

- Windrows, slashpiles, treetops
 - cover, nesting sites, and germination sites
- Fallen or residual downed logs
 - fungi and phosphorus
 - insects, cover, and nutrient cycling



Downed Logs

- Important habitat for salamanders, toads, insects
- Larger logs important for ruffed grouse drumming sites



Ring-necked snake

Northern red salamander



Vary What You Do!!

- Be creative, keep records and experiment
- Different stand shapes & sizes
- Different stand treatments
 - site prep, intermediate treatments, rotation lengths, disking regimes
- FIRE, FIRE, FIRE, FIRE, FIRE

Image Acknowledgments

- Tom Barnes, University of Kentucky
- Greg Yarrow, Clemson University
- NC Wildlife Resources Commission
- Robert Bardon, NC State University
