

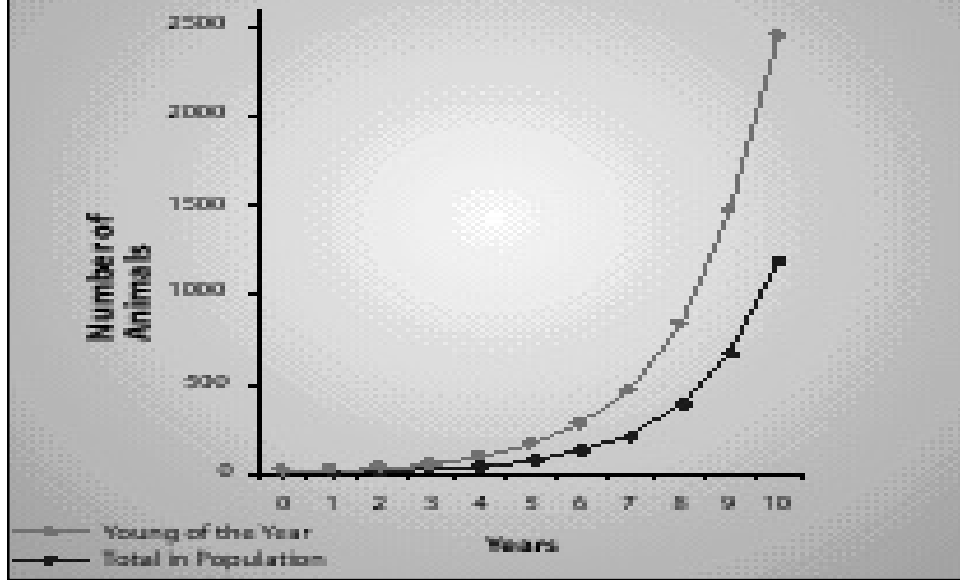
Advanced Wildlife Management : Deer, Turkey & Quail

**Master Tree Farmer II
March 19, 2002**

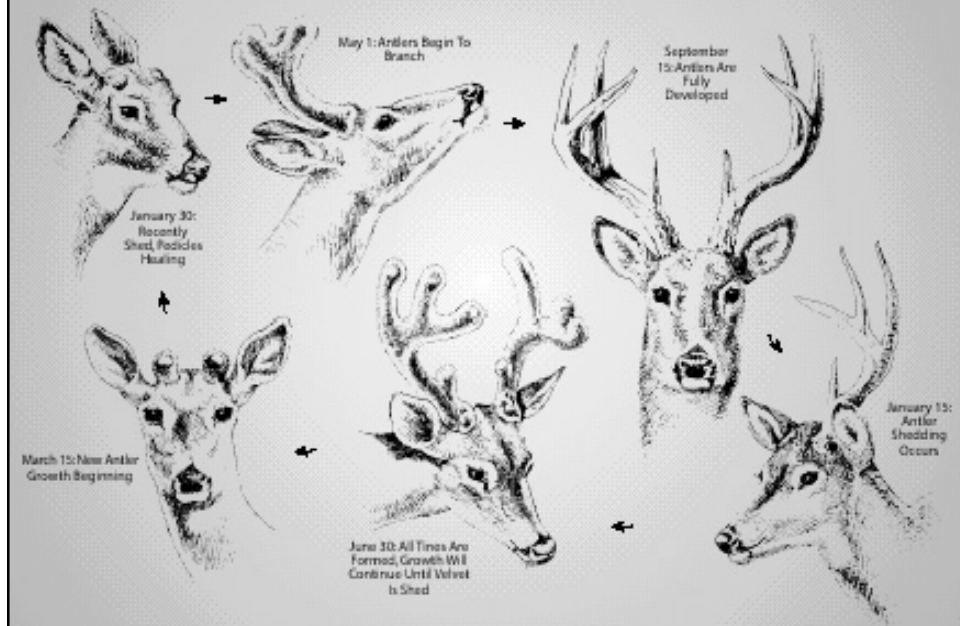
Biology & Life History of White-tailed Deer

- **After WWII restocking**
- **Polygamous breeders**
- **Breeding period = rut**
- **October - January in SE**
- **Gestation 190-210 days**
- **Fawns born May - Sept.**
 - twins common
- **Implications of late fawning**

Unhunted Deer Population 10-Year Potential



Antler Development Cycle



Biology & Life History of White-tailed Deer

Factors Influencing Antler Size & Conformation

- **Age**
- **Nutrition**
- **Genetics**
- **Herd Management**

Biology & Life History of White-tailed Deer

- **Seasonal color change**
 - lose spots 3-4 months
 - reddish summer
 - gray or gray-brown winter
- **Parasites & diseases**
 - epizootic hemorrhagic disease (EHD or “blue tongue”)
 - anthrax
 - internal & external parasites
 - nasal bots
 - skin tumors or “warts”

Biology & Life History of White-tailed Deer

Habitat Requirements

- **Cover**
 - fawning
 - thermal
 - resting
 - escape
 - dense unthinned pines
 - 3- 4 year cutovers
 - rough abandoned fields
 - thickets

Biology & Life History of White-tailed Deer

Habitat Requirements

- **Food**
 - quantity & quality
 - over 700 food items eaten
 - 17% crude protein
 - 6 - 10% native foods
 - seasonal availability
 - natural & planted foods
 - management increases abundance & quality

Biology & Life History of White-tailed Deer

Habitat Requirements

- **Water**
 - not a limiting factor in the Southeast

Habitat Improvements

- **Pine stands**
 - increase browse production
 - thin to BA 50-60 sq. feet/acre every 5-6 years
 - openings created by harvests
 - 5 - 10 acre clearcuts
 - prescribe burn 3-5 years

A regeneration harvest, thinning, or other silvicultural practice is needed every 6 - 10 years to stimulate browse production

Habitat Improvements

- **Mixed pine-hardwood stands**
 - increase browse & mast
 - thin frequently
 - renews understory, improves mast production
 - BA 20 sq. feet/acre of mature mast-producers
 - mix of red & white oaks

Habitat Improvements

- **Hardwood stands**
 - mixture of mature mast producers
 - open stands for understory production
 - thinning
 - 5 - 10 acre clearcuts

Other Forest Stand Habitat Improvements for WTD . . .

- **Fertilization of honeysuckle patches**
 - 1/4 acre patches 500 lbs. lime, 75 lbs. 13-13-13 in April and September/October

Other Forest Stand Habitat Improvements for WTD . . .

- **Salt or mineral blocks?**
 - Late spring/early summer
 - of value on nutrient depleted soils
 - use fortified mineral blocks
 - check regulations / baiting

Select Plantings for Deer

Clover & small grain mixtures
Small grains (wheat, oats, barley, rye)
Ryegrass
Austrian Winter Pea
Joint Vetch
Cowpeas
Sawtooth Oak
Others

Summary of White-tailed Deer Habitat Considerations . . .

- **Variety of soft & hard mast**
- **Mixed forest stands & openings**
- **Timber thinnings**
- **Prescribed burning every 3 - 4 years**
- **Fertilize honeysuckle patches**
- **Food plots 3 - 4 acres in size**
- **Harvest Records**

Biology & Life History of Wild Turkeys

- **Success of trapping & relocation**
- **Largest game bird native to SE**
- **Gobbler colorful caruncles, spurs & beard**
- **Mating season March - June**

Biology & Life History of Wild Turkeys

- **Egg laying begins in March & early April**
- **10 eggs per clutch (2 weeks required)**
- **28 days incubation**
- **Predation high**

Biology & Life History of Wild Turkeys

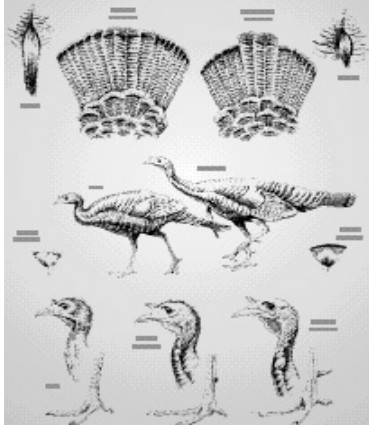
- **Brood-rearing**
- **18 days strong flyers**
- **1/2 - 3/4 mortality**
- **Poult survival depends on brood-rearing habitat**
- **Follow drainages to openings or bugging sites**
- **Insects high in protein 90% of diet first 4 weeks**

Biology & Life History of Wild Turkeys

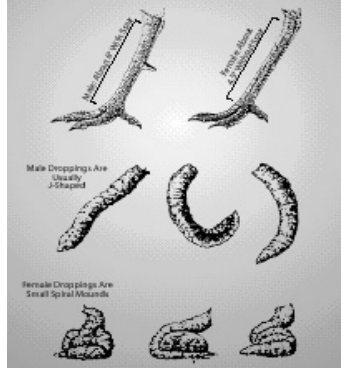
- **In flocks fall & winter**
- **Range depends on resources**
- **Daily 50 - 100 acres**
- **Limiting factors**
 - **habitat loss**
 - **weather**
 - **predation**
 - **disease & parasites**

Biology & Life History of Wild Turkeys

Physical Characteristics Of Turkeys



Turkey Foot And Dropping Characteristics



Biology & Life History of Wild Turkeys

Habitat Requirements

Quality habitat can support 1 bird/20 - 30 acres
or 1 flock/640 acres

- food - invertebrates, seeds, vegetation
- cover - nesting, brood-rearing, roosting, escape
- water - only for travel ways for hens & poults

Habitat Improvements

Hardwood Management

- Variety of oaks and mast producing-trees (50 -100 years or 14 - 24” DBH)
- Mixture of red & white oaks
- Target swamps, river & creek bottoms, and drains for mast production
- Remove poor quality trees with release cuts
- Small hardwoods stands (<50 acres) use group selection harvests
- Clearcuts 25 - 50 acres in size
- Retain soft mast producers

Habitat Improvements

• Pine Management

- Sawtimber rotation thin & burn
- Recently cut stands used for several years
- Pine plantations thin & burn soon as possible
- Burn on a 2-4 year rotation
- Hardwoods distributed through stands as SMZs
- Irregular clearcut no larger than 200 acres

Habitat Improvements

- **Manage Openings**
 - feeding sites
 - seeds, insects, green veg.
 - pastures, fields ,cropland, logging decks, roads, roadsides, rights-of-way
 - prefer 5 - 20 acres in size
 - 10% of average in open land

Select Plantings for Wild Turkey

Clover & small grain mixtures

Clovers

Small grains (winter wheat, rye, oats, barley)

Ryegrass

Chufa

Corn

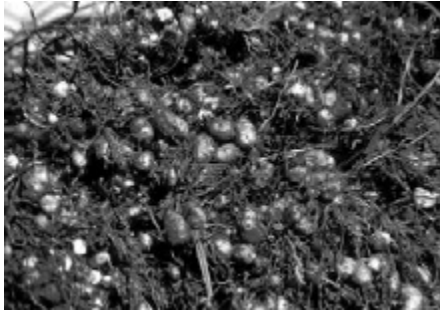
Soybeans

Grain sorghum

Peanuts

Cowpeas

Bahia grass, Indiangrass, Bluestem



Chufa for turkeys



Summary of Habitat Considerations for WT . . .

- **Multiple stands and openings**
- **Nesting & brood-rearing cover
critical adjacent to hardwood drains**

Summary of Habitat Considerations for WT . . .

- **Openings for bugging**
- **Variety of hard & soft mast**
- **Timber thinning & prescribed burns**
- **Road closure & limit disturbance during nesting**

Biology & Life History of Bobwhite Quail . . . *Wild birds*

- **Nesting in Spring**
- **Average 14 eggs, incubation 23 days**
- **Male & female incubate eggs**
- **Only 1 brood/year, attempt to renest**
- **Nest failures due to wild fires, weather, predators, ag or forestry activity**
- **Late June early July peak of hatching**
- **60-70% mortality first 2 weeks of life**

Factors Limiting Quail

Populations . . . 80% mortality each year

- **Changes in land-use patterns**
 1. **Cleaner more mechanized farming methods**
 2. **Conversion to larger fields & intensive cultivation**
 3. **Development of more pastures**
 4. **Restricted use of prescribed burning**
 5. **Where burning, large scale without protecting cover**

Factors Limiting Quail

Populations

- **Variety of available food is important**
 - **seeds of legumes & grasses, insects, cultivated foods, hard & soft fruit**
 - **beggarweeds, partridge peas, milk peas, butterfly peas, native & cultivated lespedezas (common, bicolor, Kobe, Korean) sesbania, paspalum, panic grass, ragweed, blackberry, mulberry, pine, oak, cultivated crops (soybeans, corn, sorghum cowpeas, wheat)**

Factors Limiting Quail Populations

- **Cover is critical**



Nesting



Multi-use



Brood-rearing



Escape

Factors Limiting Quail Populations

- **Weather**
- **Predation**
 - hawks, raccoons, opossums, skunks, feral house cats, dogs, snakes, foxes, coyotes, cotton rats
- **Disease**
- **Inherent cyclical nature of quail populations**

Specific Habitat Recommendations

In & Around Agricultural Fields

- **Leave 2-3 rows of unharvested grain crops around field borders**
- **Leave 50 feet wide strips of uncut vegetation on borders of hay fields**
- **Break up larger fields with pine or fallow strips, irregular in shape to optimize edge**
- **Borders & idle areas of fields managed for feeding, nesting, brood-rearing cover & winter roosting**
- **Limit insecticides - direct & indirect impacts ... manage for insects**
- **Limit herbicides - reduces food & cover**

Specific Habitat Recommendations

- **Protect existing high value areas**
 - plum & sumac thickets, blackberry & honeysuckle patches
- **Develop native and cultivated food sources**
- **Disturb the land to favor grasses/legumes**
 - prescribed burning, mowing, disking
 - disk old broomsedge fields to reduce matting & stimulate other plants
 - disk 50-75 feet wide strips in winter/early spring (new growth, also attracts insects)
 - **manage these strips by re-disking every other year and applying fertilizer to the strips every 3rd year**

Specific Habitat Recommendations

- **Vary disking by season to favor variety of seed-producing plants**
 - **disking in winter favors heavy-seeded quail foods such as ragweed & partridge pea**
 - **disking in April increases grass seed production (panic grasses)**
 - **disking in June encourages fall quail food plants and vegetation that attracts insects**
 - Beware of bermuda grass invasion & destroying quail nest or causing abandonment*
 - **disking in summer stimulates other plants such as Florida pussley, poor-joe & blackberries**
- **Establish strips close to cover**

Specific Habitat Recommendations

- **Seed production in strips can be increase with select fertilization**
 - **fertilizer recommended for legumes (no or little nitrogen)**
 - **get soil test**
 - **apply shortly after disking**
 - **monitoring results is important, may get more competitive less desirable plants (bermuda grass, fescue & crabgrass)**

Specific Habitat Recommendations

- **On poor soils, some managers have had success increasing native seed production by applying lime to raise soil pH**
 - enables plants to better absorb nutrients
 - in some cases doubled the coverage of quail food plants
 - broadcast basic slag at a rate of 1 ton/acre
- **Avoid plowing ag fields in late summer & fall**
 - reduces feeding cover

Specific Habitat Recommendations

- **Supplemental plantings if native foods low**
 - **Divided into 2 general types of plantings:**
 1. **Fall & winter**
 - concentrate birds during for hunting
 - draws birds from adjoining managed land
 - makes area attractive to birds year- round
 2. **Spring & summer**
 - food & cover for brood-rearing
- Combination of both best with annuals & perennials***

Recommended Fall/Winter Plantings ...

- **Annual lespedezas (common, Korean & Kobe)**
- **Florida beggerweed**
- **Shrub lespedezas**
 - *L. bicolor*, *L. thunbergii* (Amquail variety), *L. japonica*
 - strips 15-20 feet wide, 100-300 feet long, adjacent to cover
 - maintain by mowing to height of 4-8 inches in late February after 1st growing season , then every February 3-5 years followed by fertilization (soil test)

Specific Habitat Recommendations

- **Large partridge pea**
- **Size 1/10 (15 feet x 300 feet) - 1/4 acre**
- **1 plot/15-20 acres**
- **Current research suggest larger plots (1 acre +) in some cases**
 - located close to cover
 - for hunting purposes plant low-growing plants
 - partridge pea, annual lespedeza, browntop millet
 - taller plants (corn & sorghum) in plots 1/10 acre in size

Select Plantings for Bobwhite Quail

Annual lespedeza
Shrub lespedeza
Partridge pea
Bahia grass
Bluestem
Indiangrass
Reseeding Soybean

Corn
Cowpeas
Soybeans
Millets
Small grains
Clovers
Sunflower
Other

Specific Habitat Recommendations

Developing Cover

- **4 essential cover types must be present**
 - 1. Nesting cover** - moderately dense grass-broadleaf weed mixtures interspersed with bare ground. Mixes of 2 year-old annual & perennial grasses, forbs & legumes. *Don't develop in wet soils or soils that flood.*

Specific Habitat Recommendations

Developing Cover

- **4 essential cover types must be present**
 - 2. Brood-rearing cover - mixtures of annual legumes, forbs & grasses with bare ground & high insect production.**
 - Patches of annual weeds, partridge pea, ragweed
 - burned woodlands
 - disked fallow fields
 - annual planted patches

Specific Habitat Recommendations

Developing Cover

- **Create transition zones to provide nesting & brood-rearing habitat**
 - Creates edge & third habitat type
 - Established along edges of cultivated field or pastures, usually unproductive for ag
 - 30 plus feet wide
 - allow native vegetation to grow
 - after several years burn, mow or disk when 50% of soil is covered in dead vegetation (2-6 years)
 - rotational disturbance leaving parts intact for cover

Developing Cover

3. Escape cover - shrubby & woody areas like brushy fence rows and field dividers

- wild plum, wax myrtle, pine thickets, wild cherry, sumac, other
- protect from disturbance
- break up large fields with strips of escape cover
- maintained one side of escape cover by mowing, disking or burning every 3-4 years in early spring

4. Winter-roosting cover - provides thermal and protective cover, usually evergreen vegetation

Developing Cover

• Pines

- 6x12 or 8x12 foot spacing in pine regeneration
- mowing or disking between rows
- create 3-5 acre openings or 100 foot wide corridors in native/cultivate foods as canopy closes
- scatter openings 25% of area, or 1 opening per 15-20 acres of forest
- thin as soon as possible
 - thin to BA that is equal to the site index minus 25 (no more than a BA of 80 sq.ft.)
 - rule of thumb = 50% or ground has sunlight at mid-day

Developing Cover

- **Pines**

- Prescribe burn February - March
- Additional research on the effects of spring & summer burns
- Protect cover with 5-20 acre “ring-arounds”
- Burn in 10-50 acre units
- Adjacent units burned following year to leave cover
- If larger units burned, retain 25-40% of area unburned in 5 + acre patches
 - *Current research indicates that nesting success is higher in larger unburned blocks (20-30 acre)*

Developing Cover

- **Pines**

- Create a mosaic pattern of burned & unburned patches by burning with a cool backfire know as “dirty burning”
- Creates cover adjacent to feeding areas
- Creates brood-rearing habitat next to nesting areas
- Strip disk in open stands in fall & spring
 - Schedule of rotational disking during seasons
 - Disking every year favors food production & brood-rearing habitat
 - Disking every 2-3 years favors nesting habitat

Developing Cover

- **Pines**
 - **Mowing with a bushhog in open stands**
 - In early spring opens ground for brood habitat
 - Attracts insects
 - Maintains grassy woods roads, road edges, firelanes
 - Summer mowing can control hardwood thickets

Summary of BWQ Habitat Considerations . . .

- **Variety of soft & hard mast**
- **Thinning & open woods**
- **Prescribe burn (every year)**
- **Maintain/protect cover**
 - **Escape, nesting & feeding**
- **Disking in open woodlands**
- **Food Plots 1/8-1/4 acre**
- **Sound harvest strategies**

2 Excellent Videos on Bobwhite Quail Management . . .

1. *Bobwhite Habitat Management in Mississippi* includes the companion publication *Ecology & Management of the Northern Bobwhite*

(www.ext.msstate.edu/pubs/pub2179.htm)

2. *Quail at the Edge: Can We Bring Them Back?* (North Carolina State University/Pete Bromley, 919-515-7587)

Forests & Ag Lands Must Provide . . .

- **Food**
- **Cover**
- **Water**
- **Space**

How these habitat components are arranged across the landscape is important.

Categories of Wildlife Food Plants

Grasses & Forbs

Legumes

Annual and Perennial

**Woody Plants (Vines,
Shrubs, Trees)**

Warm & Cool Season

Planted and Non-Planted

**Native and Exotics (Non-
Native)**

Nutritional Needs of Wildlife

Protein

Carbohydrates

Lipids or Fats

Vitamins

Minerals

3 Ways to Provide Wildlife Food . . .

- 1. Protect High-Valued Native
Plants**
- 2. Enhance Native Plants**
- 3. Supplemental Plantings**

**In most cases, managing
existing native plants is a more
practical and cost-effective
method of enhancing wildlife
habitat.**

Wildlife Planting Considerations

- 1. Choosing the right plant**

Wildlife Planting Considerations

- 1. Choosing the right plant**
- 2. Site selection**

Wildlife Planting Considerations

- 1. Choosing the right plant**
- 2. Site selection**
- 3. Size, shape & distribution of plantings**

Wildlife Planting Considerations

- 1. Choosing the right plant**
- 2. Site selection**
- 3. Size, shape & distribution of plantings**
- 4. Land preparation**

Wildlife Planting Considerations

- 1. Choosing the right plant**
- 2. Site selection**
- 3. Size, shape & distribution of plantings**
- 4. Land preparation**
- 5. Planting dates**

Wildlife Planting Considerations

- 6. Seeding rates, fertilization & liming**

Wildlife Planting Considerations

- 6. Seeding rates, fertilization & liming**
- 7. Inoculation of legumes**

Wildlife Planting Considerations

- 6. Seeding rates, fertilization & liming**
- 7. Inoculation of legumes**
- 8. Companion plant(s)**

Wildlife Planting Considerations

- 6. Seeding rates, fertilization & liming**
- 7. Inoculation of legumes**
- 8. Companion plant(s)**
- 9. Maintenance & management**

Wildlife Planting Considerations

- 10. Cost & availability of plant
materials**

Wildlife Planting Considerations

- 10. Cost & availability of plant materials**
- 11. Weed & insect control**

Wildlife Planting Considerations

- 10. Cost and availability of plant materials**
- 11. Weed and insect control**
- 12. Record keeping**

Select Plantings for White-tailed Deer

Clover & small grain mixtures
Small grains (wheat, oats, barley, rye)
Ryegrass
Austrian Winter Pea
Joint Vetch
Cowpeas
Sawtooth Oak
Others

Select Plantings for Wild Turkey

Clover & small grain mixtures
Clovers
Small grains (winter wheat, rye, oats, barley)
Ryegrass
Chufa
Corn
Soybeans
Grain sorghum
Peanuts
Cowpeas
Bahia grass, Indiangrass, Bluestem

In Summary

Food Plots

- 1. Choosing the right plant**
- 2. Site selection, size, shape, distribution**
- 3. Land preparation**
- 4. Planting dates, seeding rates, fertilizing, lime**
- 5. Inoculation of legumes**
- 6. Companion plants**
- 7. Maintenance**
- 8. Costs**
- 9. Record keeping**

Wildlife Planting Guide and Native Plants in South Carolina (AFW 2) \$8.50

- Order via web
(<http://www.clemson.edu/psapublishing/>) or by
calling (864) 656-3261**

Select Plantings for Bobwhite Quail

Annual lespedeza	Corn
Shrub lespedeza	Cowpeas
Partridge pea	Soybeans
Bahia grass	Millets
Bluestem	Small grains
Indiangrass	Clovers
Reseeding Soybean	Sunflower
	Other

Other Forest Stand Habitat Improvements for Wildlife . . .

- **Maintaining & enhancing firebreaks**
 - native & planted foods
- **Woods road enhancement**
 - daylighting, native & planted foods
 - restricted access

Other Forest Stand Habitat Improvements for Wildlife . . .

- **Disking in open stands**
- **Mowing**

Other Forest Stand Habitat Improvements for Wildlife . . .

- **Fertilizing select oaks to increase acorn production**
 - **pelleted or liquid nitrogen fertilizer under canopy at 6/lbs/1000 sq. ft applied after heavy frost every 3-5 years apply 12-6-6 or 12-12-12 same rate**

Other Forest Stand Habitat Improvements for Wildlife . . .

- **Maintaining & managing existing openings**
- **Retain old home sites**

Intermediate Stand Practices . . .

- **Prescribed burning**
 - stimulates herbaceous plant growth
 - increase nutritional level & palatability of some plants
 - increases insect abundance
 - cover must be maintained

**Other Forest Stand Habitat Improvements for
Wildlife**

Identify & retain mast trees & shrubs

- Both soft & hard mast

**Other Forest Stand Habitat Improvements
for Wildlife . . .**

- **Forest Openings**

Hedgerows

- **Consists of fast growing woody & herbaceous plants**
- **Provide food & cover**
- **Examples include dogwoods, wild plums, blackberry, grasses & legumes**
- **Managed by cutting, mowing, disking or burning.**

Field Border Strips

- **Unplanted strips (20 feet wide) around field edges**
- **Grow up and maintain in mixture of native grasses**
- **Can also plant in grasses/legumes**
- **20 feet wide on each side of fence**
- **Can also leave several rows of unharvested crops around field borders**

Tillage Practices

- **Use practices that conserve soil & moisture**
- **Clean tillage encourages soil erosion & reduces wildlife food & cover**
- **Leave unplowed areas**
- **If fall plowing is necessary, leave unplowed borders & strips**

Other Farm Wildlife Considerations

- **Maintain high value habitats that provide food & cover**
- **Fruit-producing trees & shrubs in pastures and fields should be protected**
- **Enhance with fertilizers**
- **Plant or maintain borders of waterways in grasses & legumes**
- **Breakup fields**

**Prepared by
Dr. Greg Yarrow
Associate Professor of Wildlife
Department of Forest Resources
Clemson University**

**Photographs & graphics courtesy of the
book *Managing Wildlife* (Yarrow & Yarrow
1999)**