

UPLAND WILDLIFE HABITAT MANAGEMENT SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE

HABITAT ELEMENTS

The following habitat elements will be considered when assessing wildlife habitat. Not all may apply to every habitat type.

1. Food

- a. Type
- b. Amount

2. Cover

- a. Type
- b. Amount

3. Water

- a. quality
- b. quantity
- c. accessibility
- d. seasonal availability

4. Interspersion and Distance to

- a. crops
- b. grasses and or legumes
- c. shrubs
- d. trees
- e. water
- f. openings

5. Migration

- a. routes
- b. season of use
- c. corridors

DEVELOPMENT AND MANAGEMENT OF WILDLIFE HABITAT:

- As indicated by the wildlife habitat evaluation, certain habitat elements may be weak or missing. For the desired species, identify the types, amount, and distribution of habitat elements and management actions necessary to achieve the management objectives.
- The amount and kinds of habitat elements planned, their location and management shall be identified in a management plan.
- The use of native plant materials shall be encouraged.
- Vegetative manipulations to restore plant and/or animal diversity shall be accomplished by prescribed burning or mechanical, biological or chemical methods, or a combination of the four.
- Where feasible prescribed burning shall be utilized instead of mowing
- Livestock grazing or haying shall be conducted to maintain vegetation and composition so as to improve the desired wildlife habitat.
- Management measures shall be provided to control invasive and noxious weeds.
- To protect forbs and legumes that benefit native pollinators and other wildlife and provide insect food sources for grassland nesting birds, spraying or other control of noxious weeds shall be done on a "spot" basis.

NON-GAME BIRDS

Louisiana is home to a wide variety of non-game upland bird species. Depending on the species, habitat recommendations could be significantly different. Habitat requirements of one species may actually conflict with life requirements of another species. For example the concept of increasing biological diversity by increasing the amount of transitional areas between habitats (edge-effect) has long been thought to provide richness in food, cover, and other life requirements, especially for game species. However, many species of forest interior birds appear to exhibit low reproductive success where edge habitats appear to concentrate the negative effects of nest predators. For specific recommendations pertaining to managing habitat for a target non-game species contact a NRCS Wildlife Biologist.

BOBWHITE QUAIL (*Colinus virginianus*)

1) Food

- a) Enhance and establish native food plant species - Enhance areas of partridge pea, beggarweed, common ragweed, wooly croton, lespedeza, blackberry, Carolina geranium, and panic grasses by soil disturbances and/or vegetative succession manipulations (light disking, prescribed burning, etc.) after seed production. Retain, establish, and encourage growth of native woody food producing trees and shrubs such as sumac, elderberry, mayhaw, crabapple, flowering dogwood, blackberry, black cherry, red mulberry and various oak, pine, and plum species, especially adjacent to herbaceous cover. Establish suitable sites to partridge pea, beggarweed, and switchgrass. For best results, the enhancement or establishment of native plants should be adjacent to adequate cover. Refer to NRCS standards and specifications on Prescribed Burning (338), Firebreak (374), Conservation Cover (327), Range Planting (550), and Tree and Shrub Establishment (612).
- b) Food plots/feeding - Areas can be established to both native and non-native food plant species on well drained, non-erosive, fertile sites. Plant food plots to annual type lespedeza, bicolor/thunberg lespedeza, grain sorghums, soybean, domestic pea species, beggarweed, partridge pea, Illinois bundleflower, vetch, browntop millet, or a grass-legume mixture such as little bluestem and clover species. Plots should be at least 15 feet in width and at least one quarter (1/4) acre in total size. One food plot per 20 acres is recommended. Bicolor in combination with common lespedeza will provide food through the winter months if located near adequate cover. Livestock and destructive fire should be excluded from food plots.
 Feed (i.e., grain, processed food pellets, seeds, etc.) can be placed within the habitat as a supplement to natural foods and planted food plots. Use only seeds, grain, or food items approved for livestock or human consumption. If unsure about feed quality, either have it tested for mycotoxins, such as aflatoxins, or do not use it. Utilize grain with relatively low moisture content such as no higher than 13% for corn. When possible avoid placing feed directly on the ground. If feed is placed on the ground, provide only the amount that will be consumed quickly. Properly designed, covered, dispersing feeders should be used to minimize problems associated with increased moisture, mildew, and/or decay. Keep feed and feeders clean and dry. Regularly move feed locations to avoid fecal accumulation and increased predation at feed sites. Be aware feeding increases the potential of disease transmission among quail and other wildlife and should be done only after consulting competent wildlife specialists. Refer to NRCS standards and specifications on Range Planting (550), Tree and Shrub Establishment (612), Livestock Exclusion (472), Prescribed Burning (338), Firebreak (394), and Conservation Cover (327).
- c) Utilization of agricultural crops - When agricultural crops such as corn, soybeans, millet, wheat, or any grain are harvested by mechanical means, delay tillage until spring, especially in areas near adequate cover. Strips of unharvested crops, at least 30 feet wide and various lengths, should be left near adequate cover.

- d) Animal matter - The use of insecticides (toxic substances) on or near plant food sources should be discouraged, if possible, due to the high requirement of animal diet especially by young birds. Native flowering plant species such as; black-eyed Susan, Mexican hat, blazing stars, coneflowers, coreopsis species, and primrose species should be planted near openings to facilitate insect attraction. When used, these flowering plants should be part of a mixture dominated by associated native grasses. Common animal food sources include; ground beetles, weevils, grasshoppers, crickets, caterpillars, spiders, snails, centipedes, sow bugs, and other invertebrates.

2) Cover

- a) Existing cover - Retain existing woody and herbaceous vegetation especially when composed of food producing plants (i.e., crabapple, plum, dogwood, pines, blackberry, etc.), upland weeds and forbs (i.e., partridge pea, common ragweed, beggarweeds, chickweed, wild geranium, doveweed, etc.) and bunch grasses (i.e., big bluestem, little bluestem, pinehill bluestem, switchgrass, eastern gamagrass, Indiangrass, etc.). In dense areas, or areas containing undesirable species, clear linear openings, one acre in size per 20 acres of cover. In openings or on open land, if food or cover species are not to be planted, allow natural plant succession to vegetate at one acre intervals. Ideally suitable food sources should be located nearby.
- b) Establishing cover - Plant plum, crabapple, mayhaw, black cherry, flowering dogwood, red cedar, blackberry, bicolor lespedeza, sugarberry, and common persimmon in clumps of at least 20 feet in diameter near suitable food sources. Do not plant red cedar trees within two miles of apple, crabapple, or mayhaw plantings because of the potential to transfer cedar apple rust (*Gymnosporium* sp.). Within openland or cropland, establish woody cover on approximately five (5%) percent of the property.

Woody cover should be a minimum of 30 feet wide and at least one half (1/2) acre in size. The cover should be well distributed across the property. Areas between the woody cover should be planted to a bunch grass and legume mixture or simply let natural plant succession occur. Native species require less maintenance and are adapted to the site, climate, and predators, therefore encouraged.

Maintain open areas in native grasses/shrubs by lightly disking every three (3) to four (4) years. Prescribed fire can also be used to set back plant succession. Prescribed fire should be used every one to three years depending on the site. Bunch grasses and legumes adjacent to woody vegetation serve as nesting and foraging habitat and the tree and shrubs provide protection from climate and predators. Do not use fescue, sericea lespedeza, bahia grass, and Bermuda grass for quail. Refer to NRCS standards and specifications on Range Planting (550), Conservation Cover (327), and Tree and Shrub Establishment (612).

3) Water

- a) Free-water is not usually a limiting habitat factor for quail in Louisiana. Precipitation, succulent vegetation, juicy fruits, and insects can be a source of quality water.

4) Habitat Management

- a) Cover plants - Most native herbaceous plant species and mature southern pine stand ecosystems respond favorably to prescribed burning. Prescribed burning is an ideal method to maintain proper vegetative condition; however the use of this practice must be in compliance with existing laws. Burning an area every one to three years after the herbaceous components have produced seeds (late winter) is often considered best. Utilizing small growing season burns can encourage other beneficial plants and contribute to overall edge effect (diversity) without habitat fragmentation. Only use fire on applicable herbaceous and pine tree stands, eliminate fire from hardwood species.

Mowing, disking, and thinning can also enhance quail habitat through plant succession manipulation. Disking areas in late October and November will usually result in increased

legume production. Areas should be protected from mowing and disking from late spring through early fall (May-mid-September) to provide protection of nests and young. Maintain woodland openings in early stages of plant succession.

Thin pine species to a basal area of no greater than 50 to 60 square feet per acre to maintain quality quail habitat. Protect food and essential cover from destructive fire and grazing. Limit free-ranging livestock, dogs, and cats. Refer to NRCS standards and specifications on Prescribed Burning (338), Firebreak (394), Forest Stand Improvement (666), and Livestock Exclusion (472).

- b) Food plants - Maintain adequate fertility levels for food plot plantings by fertilizing and liming according to soil tests results. Cultivate bicolor lespedeza the first year of planting. Cut bicolor off near the ground in late winter following the second growing season and fertilize. Cut near ground level and fertilize every three to five years thereafter.

Mow, disk, or use prescribed fire on perennial herbaceous food plot plantings to encourage germination of seeds, increase plant species diversity, and control woody vegetation. In areas containing partridge pea, fall disking every 2 to 3 years is the recommended maintenance option. Disking should not be conducted annually because of the potential to eliminate food and cover. Exclude livestock from food plots. Fire should be excluded from hardwood food producing species.

The majority of ideal quail habitat will contain open areas, tree and shrub cover should make up five to 15%, and approximately 25% of the area should be in food plots or fallow disked. Firebreaks can be established to Virginia wildrye, wheat, rye, clover, or other suitable cool season species for winter forage and cover. If necessary to improve habitat and/or reduce fuel accumulation, these firebreaks can be bush-hogged or disked and overseeded to a suitable warm season food source or simply bush-hogged during the onset of growing season. Refer to NRCS standards and specifications on Prescribed Burning (338), Firebreak (394), and Livestock Exclusion (472).

EASTERN WILD TURKEY (*Meleagris gallopavo silvestris*)

1) Food

- a) Enhance, retain, and establish native food plant species - Wild turkeys feed on acorns, fruits, tubers, green herbaceous material, and invertebrate animal matter. In late fall, winter, and spring, wild turkeys utilize acorns, beechnuts, chinquapins, fruit from flowering dogwood, blackgum, holly, and muscadines, seeds from pine, palmetto, and native grasses, and green leafy material for grazing from native grasses, vines, and forbs. In summer, and early fall, turkeys prefer blackberries, elderberry, huckleberries, crabapples, plums, mayhaws, mulberries, persimmons, greenbriars, panic grasses, and legumes like beggarweeds and clovers. These plant species should be retained and their growth encouraged.

Light disking, mowing, and prescribed burns should be utilized every one to three years on areas containing native herbaceous plants to remove old growth, increase seed production, and reduce woody plant invasion. Prescribed burns should also be utilized every two to three years in mature pine stands or applicable longleaf pine stands for stimulating seed and legume production.

On suitable soils in full sunlight, plant, retain, or protect tree and shrub species such as sumac, elderberry, mayhaw, crabapple, flowering dogwood, black cherry, red mulberry, French mulberry, and various oak, pine, and plum species, especially adjacent to openings containing beneficial herbaceous plants.

Existing vegetation can be fertilized according to soil test results to encourage plant growth. Establish transitional open areas in woodlands such as rights-of-way in partridge pea, Illinois bundleflower, tickclover, and switchgrass or simply mow or disk large portions of these areas

periodically to set back plant succession. Refer to NRCS standards and specifications on Conservation Cover (327), Range Planting (550), Tree and Shrub Establishment (612), Prescribed Burning (338), Firebreak (394), and Forest Stand Improvement (666).

- b) Food plots/feeding- Areas can be planted to both native and introduced food plant species. Food plots should be constructed on fertile, well drained, non-erosive sites. Plots should contain at least two types of food plants, grain (seed) producers and forage producers (grasses, legumes). An example of this could contain wheat and clover. This type of combination produces late winter and spring green forage, grain, nesting and brood rearing range in the late spring and early summer, and forage and loafing areas throughout the remainder of the summer. It is beneficial to have both winter and spring food plots on the property.

Food plots on loamy to sandy soils can be established to chufa, which is favored by turkeys and other competing wildlife including feral hogs, raccoons, insect larvae, and gophers. Corn may be planted as a food plot item; however, it must be managed to produce reasonable yields and must be knocked down when mature to be available. These factors should be considered prior to planting. Common species planted for fall/winter food plots include crimson, red, ball, and white clovers, oats, wheat, rye, ryegrass, chufa, Austrian winter pea, singletary pea, partridge pea, and hairy vetch.

Common species planted for summer food plots include cow peas, peanuts, sunflower, grain sorghum, alyce clover, soybeans, millets, sunflower, and annual lespedezas. Because most of these plant species are relished by other wildlife (i.e., deer), adequate acreage should be devoted to insure establishment. Depending on the competing wildlife populations, food plots should be a minimum of an acre in size, per every 160 acres of habitat. Food plots should be protected from livestock and destructive fire. Apply lime and fertilizer as needed according to a soil test. Do not fertilize food plots for turkeys with chicken litter. Do not plant Bermuda grass, fescue, or sericia lespedeza for wild turkeys.

Supplemental feeding of wild turkeys is not recommended. Artificial feeding increases the risk of birds contacting potentially lethal diseases. Repeatedly placing grain in the same area may expose otherwise healthy birds to disease contaminated soils, and grain containing toxins and diseases. Properly distributed food plots are preferable. Refer to NRCS standards and specification on Conservation Cover (327), Range Planting (550), and Livestock Exclusion (472).

- c) Utilization of agricultural crops - Large expanses of cropland contribute little to wild turkeys unless located along woodland edges. When agricultural crops such as corn, soybeans, millet, wheat, or any grain are harvested by mechanical means delay tillage until spring in areas near suitable woodland cover. Strips of unharvested crops, at least 30 feet wide and various lengths, should be left near adequate cover.
- d) Animal matter - Poults are dependent on a high protein diet (mostly insects). Fall and winter plots can also provide excellent bugging areas when left through the summer. The use of insecticides (toxic substances) on or immediately adjacent to plant food sources should be discouraged, if possible.

When planted correctly, annual spring/summer food plots often provide secondary benefits by attracting insects to sparse ground cover which facilitates feeding on animal matter by poults and pre-nesting hens. The establishment of native flowering plants such as black-eyed Susan, Mexican hat, coneflowers, blazing stars, primrose species, and coreopsis species along edges between woodland and open areas should provide numerous insect species. When used, these flowering plants should be part of a mixture dominated by associated native grasses. Common animal food sources include crickets, grasshoppers, and cicadas.

2) Cover

- a) Existing cover - Retain existing mixed stands of hardwoods and pines, dominated by oak species. Good cover for turkeys includes trees at least six or more inches in diameter and at least 30 feet in height. Mast producing forestlands with an open understory provide excellent turkey habitat. Turkeys do not range well in dense undergrowth. Randomly scattered open areas and creek bottoms create much-desired edge effect and increase biological diversity. Approximately 2,000 acres of contiguous habitat (whether singly or multiply owned) is needed to support a huntable population for the average organized club.
- b) Establishing cover - Reforest the majority of areas to suitable tree species with dominance of oaks. A small percentage (10-30) of the planted species should provide fruit or soft mast. From 10-25% of the area should be created and/or maintained as openings. Openings should be at least two to five acres. Large openings are more beneficial than small ones. Food plots can be established within the open areas. Refer to NRCS standards and specifications on Tree and Shrub Establishment (612), Forest Stand Improvement (666), and Conservation Cover (327).

3) Water

- a) Turkeys will get water from succulent vegetation, fluids from insects, precipitation, fruits, berries, and dew. However, at times (late summer) moisture content in these sources can be low. It is beneficial to have a source of perennial, good quality, free-water within 1/2 mile of all parts of the habitat. Refer to NRCS standards and specifications on wildlife watering facilities (648).

4) Habitat Management

- a) Cover and food plants - Timber management plans should be developed which favor long cutting rotations (80 years for hardwoods, 60 years for pine), emphasize hardwood species especially oak, retain riparian buffers, and maintain and encourage diverse plant communities. Clear-cuts should be limited to 40-acre blocks, and up to 25% of the area should be maintained in openings. Controlled burning should be used in pine areas to encourage valuable food plants, control excessive undergrowth, and reduce excessive fuel accumulation. Units of manageable size should be controlled burned as weather conditions, local ordinances, and other variables allow. The entire habitat should not be burned at once. Hardwoods and stream bottoms should be protected from fire. Maintaining large old growth timber near waterbodies (i.e., swamps, sloughs, etc.) provides roosting habitat. Basal area of the stand should be maintained at a balanced level that encourages an understory open enough for turkeys yet has sufficient crown development to ensure optimal mast production. Fragmented habitat should be connected with woody travel corridors (200 feet in width).

Herbaceous areas including food plots should be mowed, lightly disked, or prescribed burned to limit woody encroachment, encourage reseeding, and remove undesirable vegetation. Areas should be protected from mowing, disking, and large scale burning during spring and summer (April-September). Exclude livestock from food source areas and limit free-ranging dogs and cats. Do not fertilize openings, food plots, or high use turkey habitat with chicken litter. Firebreaks can be established to Virginia wildrye, wheat, rye, clover or other suitable cool season species for winter forage and cover. To reduce fuel accumulation and provide a summer food source, firebreaks can be bushhogged or disked and overseeded to a suitable warm season food source or simply bushhogged during the start of growing season. Refer to NRCS standards and specifications on Prescribed Burning (338), Firebreak (394), Forest Stand Improvement (666), and Livestock Exclusion (472).

WHITE-TAILED DEER (*Odocoileus virginianus*)**1) Food**

- a) Enhance, retain, and establish native food plant species - White-tailed deer are primarily browsers (utilizing tender leaf and stem growth of woody plants), however they do consume fruits, nuts, mushrooms, and to some extent grasses and forbs.

In springtime and even early summer, tender green vegetation is usually readily available. As the season moves toward late summer and fall, plants become dry, hard, and lose much of their nutritional content. Setting back plant succession, and encouraging new growth by mowing, thinning, light disking, and prescribed burning (where applicable) can increase food potential. Also fertilization of native or beneficial vegetation such as blackberry, greenbriar, and Japanese honeysuckle according to soil tests results can provide nutritional benefits and increase plant growth and vigor. Light disking, mowing, and/or burning areas containing greenbriars, blackberry, French mulberry, arrowwood, muscadine, rattan, pokeweed, vetch, beggarweed, ragweed, and partridge pea can also provide increased forage opportunities.

Thinning both pine and hardwood areas by select harvest or 40 acre block clear cuts allow sunlight to initiate vegetative growth. Prescribed burning in suitable pine stands will also accomplish this goal. Keep fires out of areas containing hardwood trees. Retain and establish mast-producing hardwoods, predominately oaks (representing several species of white and red oaks) for fall food production, and persimmon, mayhaw, crabapple, plum, and red mulberry for summer food sources. These species should be well distributed throughout the habitat and suited to the site. Limit competition for food from livestock. Refer to NRCS Standards and specifications on Conservation Cover (327), Tree and Shrub Establishment (612), Forest Stand Improvement (666), Prescribed Burning (338), Firebreak (394), and Livestock Exclusion (472).

- b) Food plots/feeding - Several herbaceous plant species are capable of attracting deer and producing quality forage. These plants are broken into three categories depending on their availability to deer. Cool season food plantings include rye, oats, ryegrass, wheat, crimson clover, arrowleaf clover, white clover, red clover, subterranean clover, Austrian winter pea, singletary pea, and hairy vetch. Warm season food plantings include cowpeas, sorghum, bicolor lespedeza, alyce clover, American jointvetch, soybeans, and sunflower. Permanent food plantings include the native mast producing trees and shrubs mentioned above and large mast and browse bearers such as sawtooth oak, Japanese honeysuckle, peach, fig, pear, Chinese chestnut, and plum. Long narrow rectangular plantings of at least one acre (per 20 to 100 acres of cover habitat) typically promote more use than small, round or square plots. Existing openings on level, fertile sites (i.e., utility rights of way, firelanes, logging roads and sets, etc.) should be utilized when possible. Protect all plantings from livestock or destructive fire. Fertilize and lime according to soil test results. Do not plant fescue, Bermuda grass, bahia grass, or sericea lespedeza for deer.

Feed (i.e., grain, processed food pellets, etc.) can be placed within the habitat as a supplement to natural foods and planted food plots, and as a means for attraction and harvest. Use only grain, or food items approved for livestock or human consumption. If unsure about feed quality, either have it tested for mycotoxins, such as aflatoxins, or do not use it. Utilize grain with relatively low moisture content such as no higher than 13% for corn. When possible avoid placing feed directly on the ground. If feed is placed on the ground, provide only the amount that will be consumed quickly. Properly designed, covered, dispersing feeders should be used to minimize problems associated with increased moisture, mildew, and/or decay. Keep feed and feeders clean and dry. Regularly move feed locations to avoid fecal accumulation and increased disease and parasite transmission at feed sites. Be aware feeding increases the potential of disease transmission among deer and other wildlife and should be done only after consulting competent specialists. Refer to NRCS standards and specifications on Conservation

Cover (327), Tree and Shrub Establishment (612), Prescribed Burning (338), Firebreak (394), and Livestock Exclusion (472).

- c) Utilization of agricultural crops - Leave at least one acre of soybeans, corn, grain, or sorghum unharvested near suitable cover habitat. Delay tillage until early spring when harvested mechanically.

2) Cover

- a) Existing cover - Retain existing mixed stands of uneven aged hardwoods and pines, ideally with five or more mast producing oaks per acre. At least 30% of the habitat should be dominated by thickets including tender undergrowth. Thickets provide essential escape (sanctuary) and fawning habitat. Randomly scattered open areas and stream bottoms create much-desired edge effect and increase biological diversity.

Fresh and intermediate marsh areas are also capable of supporting white-tailed deer. The more diverse the plant species within the marsh the more suitable the habitat will be for both food production and cover. Periodic vegetative succession manipulations such as prescribed burns remove undesirable vegetation and encourage tender new growth. Approximately 500 acres of contiguous habitat is needed to support and manage a healthy, huntable population for the average organized club of 20 members or less.

- b) Establishing cover - Reforest the majority of areas to suitable species with dominance of oaks. A small percentage (10-30) of the planted species should provide fruit or soft mast. Five to 10% of the area should be maintained as openings. Openings should be one to five acres in size. Food plots can be established within the open areas. Refer to NRCS standards and specifications on Tree and Shrub Establishment (612), and Conservation Cover (327).

3) Water

- a) White-tailed deer obtain a portion of their water requirements from succulent vegetation, however they do need free-water. Ideally, a perennial source of free-water should be within 1/2 mile of all portions of the range. Refer to NRCS standards and specifications on wildlife watering facilities (648).

4) Habitat Management

- a) Cover and food plants - Timber management plans should be developed which retain mast bearing hardwoods, utilize riparian zones, maintain uneven aged stands, and encourage diverse plant communities (especially in the understory). Clear-cuts should be limited to 40-acre blocks, and up to 10% of the area should be maintained in openings. Controlled burning should be used in pine areas on a three to five year cycle to encourage valuable food plants and new tender vegetative growth, and reduce excessive fuel accumulation. Hardwoods and stream bottoms should be protected from fire. Fragmented habitat should be connected with woody travel corridors (200 feet in width). Herbaceous areas including food plots should be mowed, lightly disked, or prescribe burned to limit woody encroachment, encourage reseeding, and remove undesirable vegetation. Exclude livestock from deer habitat to reduce competition for browse (especially in late summer and fall). Fertilize and lime food plots and beneficial food plant species according to soil test results. Limit free-ranging dogs. Firebreaks can be established to Virginia wildrye, wheat, rye, clover, or another suitable cool season species for winter forage then overseeded to a suitable warm season food source or simply bushhogged during the start of growing season. Refer to NRCS standards and specifications on Prescribed Burning (338), Firebreak (394), Forest Stand Improvement (666), and Livestock Exclusion (472).

GRAY SQUIRREL (*Sciurus carolinensis*) & FOX SQUIRREL (*Sciurus niger*)

1) Food

- a) Retain, enhance, and establish native food plant species - Retain and encourage the growth of mast producing hardwoods of at least eight inches DBH, primarily oak and hickory species.

Squirrels utilize several tree, shrub, and herbaceous plants including most oak species, hickory, pecan, beech, cypress, maple, black walnut, hornbeam, various pine species, blackgum, flowering dogwood, red mulberry, sweetgum, various elm species, plum, magnolia, huckleberry, crabapple, mayhaw, persimmon, black cherry, blackberry, muscadine, various fungi, and various sedges. Refer to NRCS standards and specifications on Tree and Shrub Establishment (612), and Conservation Cover (327).

- b) Food plots - Squirrels are dependent on woodlands as habitat. In situations where there is adequate woodland habitat, corn can be planted in open areas as an immediate food plot item. Food plots should be 1/4 to two acres in size, depending on the pressure from other wildlife species (i.e., deer, raccoons, etc.) Also, for slower but longer food item benefits, suitable sites can be established to combinations of the native plant species mentioned above and/or sawtooth oak, and Chinese chestnut. Refer to NRCS standards and specifications on Tree and Shrub Establishment (612), and Conservation Cover (327).
- c) Utilization of agricultural crops - If corn is planted adjacent to mature timber, leave strips of unharvested crops at least 30 feet in width and of various lengths.
- d) Animal matter - In spring and summer, squirrels utilize bird eggs, larvae, pupae, and adults of numerous insects, especially beetles. Because the majority of these animal matter food items are associated with mature woodlands, these types of habitats should be retained.

2) Cover

- a) Existing cover - Retain existing mixed stands of mature hardwood and pine species, primarily dominated by oaks and hickory. One or two old growth trees per acre should be maintained for potential den sites.
- b) Establishing cover - Reforest the area to suitable tree and shrub species with dominance of oaks and hickory. A small percentage (10-30) of the planted species should provide fruit or soft mast. Nesting structures can be constructed when there is a lack of potential nest cavities. Refer to NRCS standards and specification on Tree and Shrub Establishment (612).

3) Water

- a) Although squirrels frequently utilize free surface water, their daily needs can be met from precipitation, dew, and fluids from fruits and insects.

4) Habitat Management

- a) Cover and food plants - Timber management plans should be developed which maintain mast bearing hardwoods, utilize riparian buffers, encourage diverse plant communities, and plan long harvest rotations. Stands containing single species (monocultures) such as maple, cottonwood, willow, or sweetgum should be diversified by clearing, site preparation, and planting of suitable species. Thinnings should be planned to reduce competition from undesirable vegetation and provide increased sunlight to encourage increased mast production, and beneficial hardwood reproduction. Most woodland areas not dominated by hardwoods contain areas that could be suitable to long term production of hardwood species. These areas include the lower portion of steep slopes, drainheads, small branches, and wet flats. Special attention should be given to the production of choice hardwood trees on these areas for food and cover. Keep fires out of areas containing hardwood trees. Fire on hardwoods can lower mast production and increase mortality. Exclude livestock, including feral hogs, which compete for mast and destroy hardwood regeneration. Limit free-ranging dogs and cats. Refer to NRCS standards and specifications on Tree and Shrub Establishment (612), Forest Stand Improvement (666), and Livestock Exclusion (472).

EASTERN COTTONTAIL (*Sylvilagus floridanus*) & SWAMP RABBIT (*Sylvilagus aquaticus*)**1) Food**

- a) Retain, enhance, and establish native food plant species - Retain and encourage the growth of diverse herbaceous vegetative species. Rabbits eat a wide variety of plants and their preference for certain species varies in seasonal availability of the plants. Species associated with thickets is often utilized. In summer, rabbits subsist on tender herbaceous plants but in fall and winter they often resort to twigs and bark of young trees. Commonly utilized plants include blackberry, crabgrass, panicgrass, greenbriar, sumac, goldenrod, elderberry, and elm, sassafras, hawthorn, and oak reproduction.

Swamp rabbits also eat emergent aquatics and succulent herbaceous vegetation such as sedges, grasses, and cane. Setting back natural succession of native plants through prescribed burning, mowing, and light disking will often produce tender new growth for use as food and cover. Protect native food plants from livestock. Refer to NRCS Standards and specifications on Prescribed Burning (338), Firebreak (394), Brush Management (314), and Livestock Exclusion (472).

- b) Food plots - Rabbits will utilize most tender vegetation including garden crops. Annual winter grasses and other vegetation used as food plot items for deer and turkey can be successfully used for rabbits, especially when located near dense escape cover. Examples of these plantings include clovers (white, arrowleaf, ball, crimson, etc.), rescuegrass, ryegrass, rye, oats, soybeans, cowpeas, and Japanese honeysuckle. Plots should be 1/8 of an acre to two acres (per five acres of habitat) depending on the competition from other wildlife. Plots should also be well distributed, fertilized according to soil test results, and protected from livestock. Refer to NRCS standards and specifications on Conservation Cover (327), and Livestock Exclusion (472).
- c) Utilization of agricultural crops - Leave at least 1/2 acre of soybeans, peas, millets, wheat, sorghum or garden crops unharvested near suitable cover habitat. Delay tillage until early spring when harvested mechanically.

2) Cover

- a) Existing cover - Retain existing habitats comprised of thickets, briars, honeysuckle, weeds, transitional zones between woodland and openland, ditchbanks, and overgrown fencerows. Create openings in woodland areas up to one acre in size for every 10 acres of woodland. Allow natural plant succession to vegetate these areas. Fertilize natural vegetation according to soil test results. Exclude livestock and protect from destructive fire. Refer to NRCS standards and specifications on Brush Management (314).
- b) Establishing cover - Plant or encourage growth of 1/8 acre or more of blackberry, plum, crabapple, mayhaw, and persimmon near suitable food sources. Native bunch grass and legume mixtures should also be planted near suitable woodland cover. One such 1/8-acre planting per five acres is sufficient. Encourage thickets, especially along fencerows, and ditchbanks. Protect from overgrazing and destructive fire. Refer to NRCS standards and specifications on Conservation Cover (327), Prescribed Fire (338), Firebreak (394), Livestock Exclusion (472), and Tree and Shrub Establishment (612).

3) Water

- a) Rabbits utilize surface water when freely available, but surface water is usually not essential. Dew, succulent vegetation and other high moisture foods furnish needed water.

4) Habitat Management

- a) Cover and food plants - Favor thickets and maintain large portions of the habitat in early stages of plant succession. Most native herbaceous plant species and mature southern pine stand ecosystems respond favorably to prescribed burning. Prescribed burning is an ideal method to maintain low growing, tender vegetation. Prescribed fire, however, should not be utilized more frequently than a two to three year cycle so not to reduce existing desirable food and cover. Do

not use fire in hardwood areas. Thin and clear-cut woodland stands to maximize amount of area in thickets. Maintain woodland openings in early stages of plant succession. Adjacent to agricultural areas, establish thickets (sanctuary) by either planting cover or allowing native vegetation to grow. Mow or burn these areas on a two to three year rotation to accomplish beneficial plant succession. Areas should be protected from mowing and large scale burning during spring and summer. Protect food and essential cover from destructive fire and overgrazing. Limit free-ranging dogs and cats. Firebreaks can be established to Virginia wildrye, wheat, rye, clover, or another suitable cool season species for winter forage and cover then bush-hogged and overseeded to a suitable warm season food source or simply bushhogged at the onset of the growing season. Refer to NRCS standards and specifications on Firebreak (394), Prescribed Burning (338), Forest Stand Improvement (666), and Livestock Exclusion (472).

MOURNING DOVE (*Zenaida macroura*) & other *Zenaida*, *Columba*, *Columbina*, and *Scardafella* species

1) Food

- a) Enhance and establish native food plant species - Enhance areas each year containing woolly croton, barnyard grass, spurge, crabgrass, amaranths, pokeweed, beggarweed, partridge pea, common ragweed, and native grasses by soil disturbances and vegetative succession manipulations (light disking, prescribed burning, etc.) after seed production.
Retain, establish, and encourage growth of native woody fruit producing trees in strips (such as fencerows) adjacent to open areas. Examples of tree species include plums, mayhaw, crabapple, black cherry, red mulberry, and various pine and oak species. Establish at least two acres of open areas to native seed producing grasses and legumes such as partridge pea, beggarweed, switchgrass, Indiangrass, big bluestem, little bluestem, eastern gamagrass, sunflower, Illinois bundleflower, and other flowering forbs in conjunction with larger open areas. Limit intensive grazing and mowing prior to seed maturity. Refer to NRCS standards and specifications on Prescribed Burning (338), Firebreak (394), Tree and Shrub Establishment (612), Livestock Exclusion (472), Conservation Cover (327), and Range Planting (550).
- b) Food plots - Plant food plots at least two acres in size randomly distributed throughout a farm or one larger plot or field can be planted. Plots can be planted to browntop millet, dove proso, wheat, or corn. Planting in rows usually gives the best results. Plots should be cultivated, mowed, or burned to assure seeds fall to bare ground for ease of accessibility. At least portions of the plots should be planted from late May, June, and July to assure adequate seed availability during fall/winter migration. Wheat and browntop millet can provide food during nesting. Limit livestock utilization that inhibits seed production. Refer to NRCS standards and specifications on Livestock Exclusion (472), and Conservation Cover (327).
- c) Utilization of agricultural crops - When crops such as corn, peas, peanuts, soybeans, millet, rice, wheat, or any grain are harvested by mechanical means, delay tillage until spring, especially in areas near wooded fencerows, strips of trees, and surface water. Controlled burning these fields after harvest can remove undesirable vegetation and readily expose seeds. Refer to NRCS standards and specifications on Prescribed Burning (338).
- d) Animal matter - Although doves primarily consume weed seeds and waste grain, some insects, small snails, fruits and nuts are utilized.

2) Cover

- a) Existing cover - Retain existing upland weeds and forbs (i.e., ragweed, geranium, woolly croton, etc.) by annually disking, mowing, and/or burning (in fall) especially when located near adjacent strips of woody cover and water. Limit intensive grazing and mowing which inhibits seed production. Retain strips of woody shrubs and trees near suitable food sources, agricultural

fields, and surface water. Refer to NRCS Standards and specifications on Livestock Exclusion (472).

- b) Establishing cover - Plant trees and shrubs near suitable food sites, water, and agricultural fields. Most woody species that reach 10 to 50 feet in height will suffice for nesting, including conifers and/or hardwood trees and shrubs which produce small fruit. Refer to NRCS Standards and specifications on Tree and Shrub Establishment (612).

3) Water

- a) Doves require access to surface water on a daily basis. Any source such as a pond, tank, lake, or stream will suffice. The immediate edge surrounding the water source should be relatively clean to encourage use. Refer to NRCS Standards and specifications on wildlife watering facilities (648).

4) Habitat Management

- a) Cover and food plants - Doves occupy a broad range of habitats but generally rely on trees for nesting. Doves also rely on open, weedy areas having an abundance of grains and seeds for foraging and loafing habitat. This open, weedy type of habitat should be retained, protected from intense grazing, and enhanced to encourage seed production. Enhancement measures include vegetation succession manipulations by light disking and the controlled use of fire. Encourage areas of sparse weeds, grasses, and forbs to allow doves to readily access seeds on the ground. Native herbaceous plant species are suited to Louisiana soils, climate, and commonly require less management, and therefore recommended. Doves must have grit for grinding grain and seed consumed as food. The shoulders of roads usually provide adequate supplies of fine gravel for daily grit requirements; however, small areas (less than 1/8 acre) can be created for grit sites. Limit free-ranging dogs and cats. Refer to NRCS standards and specification on Livestock Exclusion (472), Prescribed Burning (338), and Firebreak (394).

BATS (*Myotis*, *Lasionycteris*, *Pipistrellus*, *Eptesicus*, *Lasiurus*, *Nycticeius*, *Tadarida*, and *Plecotus* species)

Bats in Louisiana feed nocturnally on insects. They rest during daylight hours usually in old growth cavity trees, in dense vegetation or clumps of Spanish moss, and in abandoned structures (i.e., barns, bridges, etc.). Nest boxes can be constructed to provide artificial den sites. Some species (i.e., *Lasiurus cinereus*) associate more with coniferous rather than solely with deciduous hardwood forests. Bats feed over wooded areas, openings in woodlands, and over ponds, bayous and lakes. For specific information regarding habitat improvements for bat species contact a NRCS Wildlife Biologist.

THREATENED & ENDANGERED UPLAND SPECIES

There are several plants, invertebrates, fish, reptiles, birds, mammals, and ecosystems associated with upland habitats that have significantly declined. Careful consideration should be given toward the impacts to threatened and endangered species and ecosystems during the planning process.

Management recommendations are specific to limiting factors associated with the species or ecosystem. To obtain planning information regarding habitat improvements for threatened or endangered species contact a NRCS Wildlife Biologist.

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