Bobwhite Quail Habitat Management Information Sheet

Conservation Practice Information Sheet ***(IS-MO645bwq)***

Evaluate your quail habitat management

Landowners interested in creating bobwhite quail habitat can spend a considerable amount of time and money while trying to create good habitat. Unfortunately, many of these landowners unknowingly make minor mistakes when completing management practices or may not recognize an easier way to create better quail habitat. As a result, the landowner often has less than ideal habitat conditions for bobwhite quail on all or part of their property.

This information sheet identifies some of the common mistakes landowners make when managing for quail. This information sheet emphasizes the importance of creating good shrubby, nesting and brooding cover for quail. Information in this guide sheet is best suited for the landowner who is two or more years into an active quail management plan, but is also well suited for the landowner just getting started. This information sheet does not explain how to complete a practice or how to manage your property for quail. Instead, it focuses on the "little things" you can do to improve your property for bobwhite quail.

This information sheet refers to "fields" on your property as "quail management units". Your ultimate goal is to have a covey of quail in each unit by providing all the basic habitat requirements in that unit. Depending on how intensive you manage your property, each quail management unit should be 15 to 40 acres in size – realizing the smaller the unit the more intensive the management will be. In each quail management unit, strive to have 10 to 25% of the area in shrubby cover, at least 30% of the area in nesting cover, and at least 40% of the area in early successional habitat/brooding cover. You should also try to have all cover types within 150 feet of each other in each quail unit.

Diverse Grassland Habitat

If you are managing your property for quail, a majority of your time should be spent developing and maintaining **diverse** grassland habitat. Quail will use diverse grassland habitat throughout the year for nesting, brooding, roosting and feeding cover. Ask yourself the following questions about the grassland habitat in each quail management unit to determine if there is any way you can improve quail habitat on your property.

1. **Do I have fescue or brome borders around my native warm-season grass fields, cropfields, woody draws, hedgerows, fencerows, or woodland edges?** If so, spray these areas in the fall with an herbicide after the warm-season grasses have gone dormant (after a hard freeze). A tall fescue or smooth brome field border will eventually encroach into native grass and shrub plantings or make edge feathering useless if not treated before cutting the trees.

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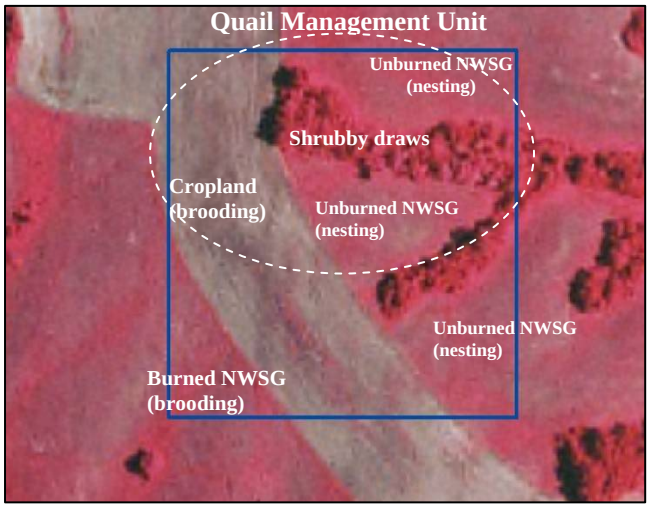
2. **Does each field have a variety of wildlife-friendly grasses, legumes and forbs?** Most fields, including most established native warm-season grass fields, do not have good forb and legume diversity for grassland wildlife. Forbs and legumes should comprise 25 to 50% of the vegetation (canopy coverage) in a management unit to provide good nesting and brooding cover. Scout your fields in June or July to determine if there is a good mix of grasses, forbs and legumes. You can improve plant diversity in each field by conducting a management practice and then overseeding legumes and/or forbs. Native forbs should be seeded between late November and early February for best results.

A fescue border between a warm-season grass field and woody cover presents a barrier to quail. Spray the fescue in the fall and allow the area to revegetate in annual plants and legumes.

3. **Does each field have adequate "bareground" habitat for nesting and brooding habitat?** Your goal is to have 30 to 70% bareground between clumps of vegetation so quail can easily move through a field, but still have overhead protection from predators. Evaluate each field in June or July to determine if you have good "bareground" habitat. Bareground habitat can be created by setting back the dominant vegetation in the field by conducting a management practice such as light disking, herbicide application, or prescribed burning.

4. **Does each field have adequate nesting cover that is close to adequate brooding cover?** From early May through August about 30% of each field should be available as good nesting cover. Ideal nesting cover is made up of the previous year's growth of wildlife-friendly cool- or warm-season grasses with a mix of forbs, legumes and bareground habitat between the grass clumps. Good nesting cover should be within 75 feet of good brooding habitat so newly hatched chicks will have a place to forage and easily move through. Brooding habitat should have bareground with an overhead canopy of wildlife-friendly grasses, legumes, forbs and annual grasses (weeds). You can provide nesting and brooding cover in close proximity to each other by completing a management practice <u>on only 1/3 of a field annually</u>. By dividing fields over 5 acres into smaller management units, you will create a patchy mix of disturbed and undisturbed areas and ultimately better habitat for quail.



Each quail management unit on your property should have nesting (unburned NWSG), brooding cover (burned NWSG and cropland) and shrubby cover close to each other. This quail unit has all the basic habitat requirements in close proximity to each other (circle).

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5. **In my wildlife-friendly grass fields, what percentage of the field has been invaded by undesirable grasses?** Tall fescue, smooth brome, reed canarygrass and bermudagrass can dominate native grass and wildlife-friendly cool-season grass fields. If left untreated these grasses will quickly spread throughout the field, eventually suppressing desirable vegetation and degrading nesting and brooding habitat. If more than 25% of the field is infested with undesirable grasses consider spraying the field with a selective herbicide. Spraying with herbicide when the native grasses are dormant in the fall, or conducting a management practice that will setback the undesirable grasses (burning in late spring to setback cool-season grasses).

6. **Do I regularly scout fields and field borders for non-native plants such as reed canarygrass, tall fescue, sericea lespedeza, crownvetch, honeysuckle or autumn olive?** Non-native plants are here to stay. By scouting each field in the spring, summer and early fall, you will have adequate time to control the spread of these non-wildlife friendly plants. Remember, one sericea lespedeza plant can produce thousands of seeds in a growing season. It is easier and less expensive to treat small infestations in part of a field instead of the entire field at a later date.

7. **What species of warm-season grass or wildlife friendly cool-season grasses do I have in each quail management unit?** The preferred grassland cover is little bluestem, broomsedge and sideoats grama with a good mix of native forbs and legumes. Taller native warm-season grasses such as big bluestem, Indiangrass and switchgrass also make good quail habitat, but may require more frequent or intensive management to keep stands open enough for quail. Undesirable cool-season grasses can easily overtake wildlife friendly cool-season grasses such as timothy and orchardgrass. Once tall fescue or smooth brome have encroached into a wildlife friendly cool-season grass field, management for quail will be difficult as it will be nearly impossible to eradicate the unwanted vegetation without killing the wildlife-friendly cool-season grasses.

Nesting and brooding habitat are by far the most important habitat components for bobwhite quail and the habitats most often overlooked by many landowners. Grass fields are vulnerable to invasion from non-native vegetation such as tall fescue or sericea lespedeza. Monitor your grass fields throughout the growing season to determine if you are providing adequate nesting and brooding cover and to identify any undesirable plants that might have invaded your fields in the past year.

Good brooding cover will have bareground, underneath a dense canopy of vegetation. Disturb a portion of each quail unit annually to maintain good brooding cover.

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Grassland Management Practices

Bobwhite quail require grassland and early successional habitat that provides both nesting and brooding cover in close proximity to each other. This can be accomplished by disturbing a different portion of the field or management unit annually with a management practice or combination of management practices. Disturbed areas will provide good brooding cover while undisturbed areas will provide nesting cover.

1. **Do I burn or complete a management practice at the same time of the year or use the same management practice every year?** Vary the time of the year you complete a management practice to maintain or increase plant diversity and plant structure. If possible, consider using a different management technique to create a different vegetative response. If you have always burned in the spring, maybe try burning in the summer or fall, or maybe try strip disking in the fall instead.

2. **Do I prepare firebreaks around each field in the summer or early fall or do I wait until right before burning?** Most landowners wait until the last minute to prepare their firebreaks. Often they are delayed by inclement weather, which ultimately delays the burning until later in the year, if at all. If possible, disk firebreaks in the summer or early fall. Disked lines are preferred over cool-season grass mowed lines since there is less of a chance of fire escaping and undesirable cool-season grasses eventually spreading into the field with disked lines. If you do use mowed lines, mow as short as possible and often to reduce the amount of duff on the line. Also, mow in early May to prevent cool-season grasses from setting seed. Another option is to plant your disk lines to food plots; either before or after burning depending on the time of the year you burn.

3. **When I complete a management practice on a grass field, do I overseed native forbs and/or non-native legumes afterwards?** Even with management, many native grass fields lack the plant diversity needed to support good quail populations. Forbs and legumes are needed to provide good brooding and nesting cover. Consider overseeding native forbs or non-native legumes after strip disking, burning or applying herbicides on the portion of the field disturbed. Overseed native forbs in December or January to ensure good germination that spring.

4. **Do I expose enough soil when strip disking?** Overgrown fields will be difficult to strip disk unless the portion of the field to be disked is mowed ahead of time. In heavy thatch fields, lightweight disks will just ride over the top the ground, barely starching the soil surface. Strip disking should expose 30 to 70% mineral soil, which may mean you have to go over the same area 2 or 3 times. Strip disking should be completed between July 16 and April 30, but the most desirable vegetative response occurs when the disking is completed before February 1. Early season disking usually promotes ragweed and other broadleaf plants while disking later in the year will encourage foxtail and crabgrass.

Strip disking should expose 30 to 50% bareground. Rotate disked and undisked strips across the contour of the field. Disk 1/3 to 1/2 of each field annually.

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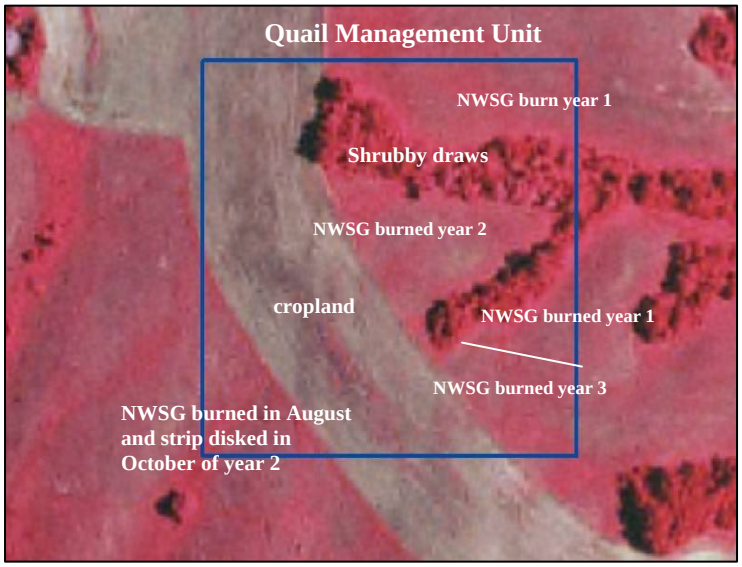
5. **Do I only treat 1/3 of each field with a management practice annually?** By treating only 1/3 of each field, a portion of the field will have good nesting cover while disturbed areas will provide good brooding cover. These two habitat components must be in close proximity to each other to provide optimal quail habitat. Treat a different part of the field the following year. If possible, try to break the 1/3 that will be treated into smaller units so the disturbed acres are throughout the unit instead of in just one corner. For example, instead of burning the west 1/3 of a 20-acre unit, try to distribute the 1/3 that will be disturbed throughout the unit by creating smaller 1 to 3 acre burn units.

6. **Do I recreational mow?** Recreational mowing of old fields and idle corners destroys possible habitat. In some cases, it may be necessary to mow areas to control invasive plants or to maintain service roads or firebreaks. If possible, avoid the urge to mow idle areas. You could be converting these areas to warm-season grasses, food plots or shrubby cover for quail.

7. **Do I use a combination of management practices?** Try strip-disking part of a field and burning another area to create greater diversity within each management unit. Alternatively, in rank stands of grass do not be afraid to use a combination of practices on the same acres to really setback the grasses. For example, consider burning a rank stand of warm-season grass in late summer and then strip disking a portion of the burned area that fall to further setback the grass.

Maintaining diverse grassland habitat is one key to creating good quail habitat. Diverse grassland habitat should contain a mix of wildlife-friendly grasses, legumes and forbs. Disturb 1/3 of each unit to provide bareground habitat for brooding cover, while the remaining portion should remain undisturbed for nesting cover. Try breaking each unit into smaller management units to create a patchy grassland of disturbed and undisturbed areas to maximize nesting and brooding habitat. Legumes and forbs should be overseeded in disturbed areas to improve plant diversity and plant structure. Monitor your fields during the summer to determine if the completed management practice is creating adequate nesting and brooding cover for quail. If not, change the time of the year you conduct the management practice or try a different technique.



Divide the grassland habitat in each quail unit into thirds for management purposes. Plan to treat a third of the acres annually in each unit. The disturbed areas will provide good brooding cover while the undisturbed areas will serve as nesting cover. Also, consider using a combination of management practices such as prescribed burning and strip disking in the same year. Consider dividing larger fields into smaller management units to create patches of disturbed and undisturbed areas within the same unit.

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Food Plot Management

One of the most common mistakes landowners make is focusing on food plots and forgetting about nesting, brooding and shrubby cover. Most landowners enjoy planting food plots because they can see instant results and this is a great way of enjoying the outdoors. Remember, establishing and maintaining good nesting, brooding and shrubby cover should always take priority over food plots, especially if your farm is in an intensive row crop area. If established properly and near good cover, food plots can provide quail and other wildlife a dependable food source throughout the winter.

1. **Do I replant food plots every year?** Replanting an entire food plot each year destroys ideal brooding habitat for quail. Divide each food plot in half and leave one half idle for an entire growing season (do not disk under the unplanted half). Replant the idled half the following year and leave the other half idle.

2. **Do I fertilize my food plots each year or take a soil test every three or four years?** If not, you are probably wasting time and money. Even food plots should be limed and fertilized according to a soil test to improve production. Contact your local NRCS or University Extension office on how to take a soil test and the location of a soil-testing laboratory in your area. A soil test will cost around $12.00 per sample, but the small cost is worth it. A soil test should be taken every 3 to 4 years to reveal any changes in soil fertility.

3. **Are my food plots too small?** Food plots should be at least 30 feet wide and at least 1/4 acre in size. Plant long, winding food plots with the contour to create more edge. Food plots smaller than 1/4 acre are easily over browsed by deer and will be of little value to wildlife that winter. In areas with high deer populations, food plots should be at least 1 acre in size. Avoid using milo or soybeans in areas with high deer densities.

4. **Do I plant food plots too thick?** More often than not, food plots are planted way to thick. The results are often little or no seed production – the intention of the food plot. Review the Food Plot Job Sheet for recommended food plot mixes and seeding rates.

5. **Do I leave unharvested grain in cropfields?** Consider leaving a 30 foot wide strip of unharvested grain next to a field border and brushy cover. Consider not spraying these strips with herbicides during the growing season to provide additional food and cover from annual weeds.

6. **Where are my food plots located in the field?** Food plots should be located in close proximity to shrubby cover. That means food plots for quail should be no more than 75 feet from existing shrubs, edge feathering, briars or downed tree structures. Consider planting shrubs, creating downed tree structures or edge feathering around food plots. Plant 1/4 to 4 acres of food plots per 40 acres of habitat.

7. **Do I plant a variety of different food plots?** If you plant all your food plots to milo, what would happen if the crop failed that year? Planting a variety of different grains, forages and legumes in different plots ensures at least one crop will produce adequate food that year. It is also a good ideal to rotate annual lespedeza, alfalfa, red clover or ladino clover into your food plot rotation for one or two years to rebuild soil fertility.

8. **Do I use herbicides on my food plots if weeds become a problem?** Sometimes food plots can fail because the plot was overtaken by annual weeds such as cocklebur or foxtail. To avoid a complete failure, consider spraying herbicide on your food plots if weeds are canopying over the planted crop. Check with your local agriservice for recommended herbicides.

Shrubby Cover Management

Shrubby cover in the form of edge feathering, existing shrubs, briars, and downed tree structures should make up 10 to 25% of each quail management unit. Shrubby cover should have bareground underneath for easy movement and be 3 to 12 feet tall and thick enough to impede predators. A good example is edge feathering or a wild plum thicket. A warm-season grass field surrounded by woods provides little shrubby cover for quail. This missing component can mean the difference between not having quail and maybe having quail. Evaluate your fields to determine if you have enough good shrubby cover.

This is good example of how to edge feather. Avoid stacking trees into dense piles when edge feathering. If possible, leave the trees where they fall or windrow them along the edge of the field. The key is to keep the trees open and loose along the edge of the field.

1. **Do I complete edge feathering correctly?** Edge feathering is one of the quickest and easiest ways of creating good brushy cover for quail. Most people do not edge feather deep enough into the woods to create adequate brushy cover. The minimum width for edge feathering is 30 feet deep into the woods, but 50 or 60 feet is even better. "Chop and drop" nearly all the trees for the first 30 feet and leave more trees standing as you move deeper into the woods. Each edge feathered strip should be at least 50 to 100 feet long.

2. **Do I treat cut stumps or girdles with an herbicide when edge feathering or conducting woody cover control?** Edge feathering and woody cover control are hard work and no body wants to do it over. If you skip treating cut stumps with herbicide (except cedar and pine) you will be cutting the same trees again in 5 years. Forget to treat a honey or black locust stump and you will be living with annoying sprouts for years. Make sure you treat stumps with herbicide.

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3. **If I have mature hedgerows and narrow woody draws, do I rejuvenate these areas by edge feathering them also?** Mature fencerows and hedgerows provide little cover for quail. Consider cutting nearly all the trees in narrow woody draws, fencerows and hedgerows. Do not treat all the stumps, as you will want to allow some of the trees and hedges to regrow, especially if the woody draw is less than 40 or 50 feet wide. Still treat the stumps of undesirable trees like locust to avoid resprouting.

4. **Do I complete a little edge feathering each year?** By completing a little edge feathering each year, you will create a variety of different plant succession stages. More variety will mean better habitat for wildlife. Consider edge feathering a little each winter. You will be amazed by the amount of edge feathering you can complete with a tank of gas.

Make sure to spray any sod forming grasses in the area to be edge feathered. In this picture, brome was sprayed the previous fall and then edge feathered.

5. **When I edge feather, do I leave the trees where they fall or do I push them into a dense pile?** Cut trees should be left where they fall. Quail and most other wildlife prefer open, loose brushy cover. Do not stack or push the trees into dense brushpiles. Move cut trees only if they fall into cropfields or roads. Otherwise, leave the trees where they fall.

6. **Do I eradicate invasive cool-season grasses before edge feathering?** It is critical that you spray tall fescue or smooth brome under the trees before you complete any edge feathering. If undesirable cool-season grasses are left untreated, they will quickly spread into the feathered area – making all your hard work useless for wildlife. Ideally, spray the field edge in the fall and complete the edge feathering that winter.

7. **Do I have tall fescue or smooth brome underneath existing shrubs and briar patches?** Many existing shrub patches have an understory of tall fescue or smooth brome that makes these areas virtually useless for quail. In the fall (after leaf drop) or in the spring (before bud break) spray the cool-season grass understory with glyphosate to make these areas usable cover. The herbicide will not harm the shrubs since they are not actively growing, or use a selective herbicide after bud break that targets only grasses.

Tall fescue, smooth brome and other undesirable grasses must be controlled before edge feathering. This edge feathered tree line is useless to quail because the fescue was not treated before cutting the trees.

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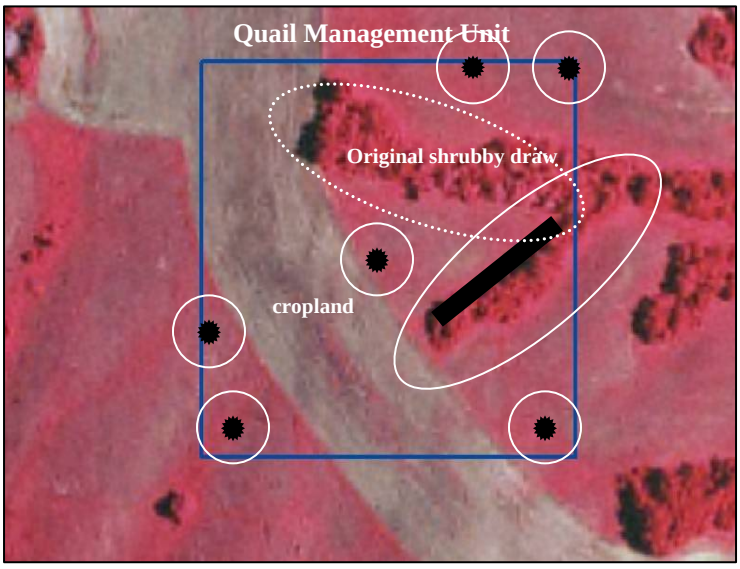
8. **Do I have native shrubs invading parts of my fields?** Take a close look at your grass fields. You will often find scattered patches of seedling blackberry, sumac and wild plum. Natural plant succession in the making! If you have scattered patches of native shrubs in your fields, why not manage these areas as covey headquarters. Kill the competing grass in each volunteer shrub patch and protect the future covey headquarter from fire by disking a firebreak around each island. Remember, each covey headquarter should be at least 30 feet wide.

9. **Do I replant shrubs into existing shrub plantings 2 or 3 years after the original planting?** Even with good site preparation and weed control you can expect some of the shrubs seedlings to die. Consider replanting seedlings the second or third year if more than 40% of the shrubs die in the original planting.

10. **When I plant shrubs, do I begin preparation in the fall by eradicating undesirable cool-season grasses where the shrubs will be planted?** It is virtually impossible to adequately kill fescue or brome in the spring with only one herbicide application. Skips and misses will be a problem and eventually the fescue or brome will recover and spread through the planting. A well-timed herbicide application in the fall and again in the spring before planting is the proper way to prepare a site for a shrub planting.

11. **Do I drag cut trees into the middle of newly planted shrub islands?** Dragging a few trees into the middle of a shrub planting will provide instant brushy cover for quail and act as a marker for each shrub planting. Typically it will take a shrub planting 5 to 7 years to provide adequate shrubby cover for wildlife. Before or after you plant the shrubs, drag at least 3 trees into the middle of the planting. Oak, hedge, hickory and cedar all make good downed tree structures. These downed tree structures will provide instant brushy cover for 3 to 5 years. By that time, the shrub planting should provide adequate shrubby cover.

12. **How far apart are areas of shrubby or brushy cover in each field?** Quail generally stay within 75 feet of shrubby cover. Most landowners only provide shrubby cover along the edges of a field, leaving the middle of the field inhospitable to quail. The same is also true for buffers. Most landowners only plant the minimum amount of shrubs or do the minimum amount of edge feathering. To maximize quail habitat have 10 to 25% of each management unit in usable shrubby cover. If the field is more than 150 feet wide, consider scattering shrub islands or downed tree structures in the middle of the field or edge feathering narrow draws that run through the field. Disk firebreaks around each island to provide dusting areas and to avoid destroying the shrub islands when you conduct a prescribed burn.



In this quail unit, only the shrubby draw in the upper right corner provides good shrubby cover for quail. Only a small portion of the field is within 75 feet of shrubby cover (white dash buffer). Additional edge feathering (black line) and creating covey headquarters in the field (black dots) will make more of this unit usable cover for quail (white buffers).

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Additional References:

JS-BIOL-13	WHAG for the Missouri Bobwhite Quail Habitat Appraisal Guide (Home Range model- 2005)
JS-BIOL-14	Forest Stand Improvement for Wildlife
JS-BIOL-15	Prescribed Burning for Wildlife
JS-BIOL-18	Edge Feathering
JS-BIOL-19	Quail Covey Headquarters
JS-BIOL-20	Native Forb and Non-native Legume Interseeding
JS-BIOL-21	Downed Tree Structure
JS-BIOL-22	Woody Cover Control – Fencelines/Woody Draws
JS-BIOL-23	Woody Cover Control – Prairie/Glade/Savanna
JS-BIOL-24	Light Disking
JS-BIOL-25	Food Plots
JS-BIOL-26	Strip Herbicide Application
JS-BIOL-27	Temporary Forest Openings for Wildlife
JS-BIOL-30	Controlling Undesirable Species

For additional information on bobwhite quail management, contact your local USDA Service Center or Missouri Department of Conservation office.

Photos courtesy of the Missouri Department of Conservation. 2006.