SE Mixed Forests & Outer Coastal Plain

American kestrel

General information
The American kestrel is a common, widespread, small raptor resembling the size and shape of a mourning dove. The males are a colorful slate-blue on the top of the head and on the wings, with a reddish colored back and tail. Females have reddish brown wings, but both sexes have characteristic black slashes on the sides of their face. They can be found in a variety of open environments, including grasslands. Often spotted perching on power lines or other tall structures searching for prey, they swiftly move their tail to keep balanced in the wind.

Because of their small size, American kestrels are predated by larger raptors, such as red-tailed hawks, and even snakes. They nest in cavities (often old woodpecker holes or natural tree hollows) with loose material on the floor and have been noted to readily use human-made nesting boxes. The males will search out and sometimes even defend a cavity, and later present it to a potential mate. Clutches usually contain 4 to 5 eggs. Chicks are altricial, meaning they are helpless for a couple weeks after hatching and must be fed and cared for.

Habitat requirements
Diet: primarily insects and small mammals associated with open areas  
Water: obtain necessary water from diet and do not need water for drinking  
Cover: nest in tree cavities and other sites including holes in cliffs, canyon walls and artificial nest boxes

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative invasive vegetation competes with native plant species and reduces habitat quality for kestrels or their prey
Create Snags: where needed for perches and increase potential nest cavities
Field Borders: to increase cover for prey around row crop fields
Livestock Management: to prevent overgrazing and maintain sufficient cover for prey and maintain early succession vegetation with scattered shrub cover
Nesting Structures: can be used where a lack of natural nesting cavities is limiting the population; nest boxes can be placed on fence posts in open areas
Plant Native Grasses and Forbs: where necessary to provide desirable cover for prey
Plant Shrubs: in large open areas where shrub cover is limiting
Plant Trees: where trees are lacking for future perching sites and cavities for nesting
Set-back Succession: Prescribed Fire, Chaining, Drum-chopping, and Herbicide Applications can maintain shrub cover and stimulate herbaceous cover
Tillage Management: will facilitate hunting prey when waste grain is available
Wildlife or Fish Survey: observation counts, point counts, and nest box usage rates may be used to estimate trends in populations
Barred owl

General information
Barred owls are found in mature forests, often near water, throughout eastern North America and the Pacific Northwest. They nest in cavities of large trees and snags, and will readily use man-made nesting structures. They hunt primarily at night, scanning for prey with keen vision and hearing and flying silently from tall perches. Their hooting call of “Who cooks for you? Who cooks for you all?” can be heard all year and is a common night sound where they occur.

Habitat requirements
Diet: primarily small mammals, birds, amphibians, reptiles, fish, and invertebrates.
Water: requirements largely unknown. They likely obtain their water needs from the foods they consume.
Cover: mature forests with an abundance of relatively large trees and cavities, often near water

Wildlife Management Practices
Control Nonnative Invasive Vegetation: where nonnative invasive vegetation is competing with native vegetation and reducing habitat quality Create Snags: where cavities are lacking for adequate reproduction
Forest Management: shelterwood harvests can result in a more open, park-like forest resulting in a more open understory to favor prey habitat.
Livestock Management: livestock should be excluded from forests to maintain understory for prey
Nesting Structures: can be added to forests lacking trees with large cavities.
Plant Trees: in large open areas to create future habitat
Set-back Succession: low-intensity prescribed fire can be used in forests and woodlands to enhance cover for prey.
Wildlife Damage Management: barred owls can prey upon small pets and domestic poultry. Exclusion practices should be used to discourage damage.
Wildlife or Fish Survey: call counts are used to index populations
Bluegill

General information
The bluegill is one of the most abundant Sunfish species. It thrives in a variety of conditions, ranging from freshwater lakes, ponds, and slow moving streams, to brackish waters of coastal areas. The bluegill’s native range is the eastern U.S. from southern Canada to Florida and Texas, but they have been successfully introduced throughout the U.S.

Habitat requirements
_Diet:_ a variety of zooplankton (microscopic animal life) during the first few months of life, progressing to insects and their larvae, eggs, earthworms, tadpoles, small minnows, and crayfish  
_Cover:_ submerged rocks, woody debris, and aquatic vegetation where small fish (prey) hide  
_Water:_ basic requirements include dissolved oxygen (minimum of four parts per million); pH between 6.5 and 9.0; and water temperature should reach at least 70 F during summer (one foot below surface in the shade)

Wildlife management practices
_Livestock Management:_ livestock should either be excluded from fish ponds or only allowed access to a small part of the fish pond; livestock watering facilities should be developed away from the fish pond  
_Repair Spillway/Levee:_ if not functioning properly  
_Water Control Structures:_ should be installed if none are present so water depth can be controlled  
_Decrease Harvest:_ refer to wildlife management practices for specifics on fish harvest  
_Increase Harvest:_ refer to wildlife management practices for specifics on fish harvest  
_Wildlife or Fish Survey:_ fishing records, seining, and electro-shocking are used to survey bluegill populations  
_Construct Fish Pond:_ where no suitable water source is present or where an existing fish pond needs extensive repair, especially to the dike or dam  
_Control Aquatic Vegetation:_ when necessary to discourage rooted aquatic vegetation  
_Fertilize/Lime Fish Pond:_ fertilize to promote phytoplankton growth when visibility is more than 18 inches below the water surface; add agricultural limestone to increase soil pH if total alkalinity is below 20 ppm  
_Reduce Turbidity in Fish Pond:_ by reseeding watershed if soil is eroding into the pond and causing muddy water, by preventing livestock from entering pond, by eliminating bottom-feeding fish, or by reducing suspension of negatively charged clay particles  
_Restock Fish Pond:_ if the population is too far out of balance to correct via seining or fishing or if undesirable species are present  
_Sreams: Create Pools:_ in streams lacking slow water, add features such as rocks, logs, and dikes to create pools to provide structure for aquatic plants, insects, and locations for spawning; be cautious that “improvements” do not increase bank erosion.  
_Sreams: Remove Fish Barriers:_ dams or other barriers restrict fish movement during weather extremes (e.g., drought, freezing cold); improve survivability by allowing fish movement to deeper pools or rivers.
Coyote

General information
Coyotes are found throughout the continental U.S. and have even been observed in large cities and urban areas. Grasslands, shrubland, and farmland provide optimal habitat for coyotes, but they also use forested areas as well. Coyotes den in a variety of places, including brush-covered slopes, steep banks, rock ledges, thickets, and hollow logs. Coyotes are most active at night, during early morning, and around sunset, but they may be active throughout the day. Coyotes live in packs, alone, or in mated pairs, depending on the time of year. Coyotes have an extremely varied diet that fluctuates with the seasons.

Habitat requirements
Diet: rodents, rabbits, and other small mammals, insects, birds, eggs, deer, carrion, and soft mast; livestock and wild ungulates (deer, elk) are usually represented in coyote stomachs as carrion; in some cases, coyotes prey heavily on deer fawns, and can limit reproductive success in some limited situations
Water: requirements are not well documented; necessary water is probably obtained in diet
Cover: grasslands, shrublands, regenerating forest, mature forest; crevices and burrows along river banks, rock ledges, brushpiles, and holes under stumps or abandoned buildings are used as den sites for raising pups

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative invasive vegetation reduces habitat quality for coyotes or prey species
Edge Feathering: to increase cover and food availability for prey species around fields
Field Borders: to increase usable space for prey species around fields
Forest Management: Forest Regeneration (Clearcutting, Shelterwood, Seed-tree, Group Selection) and Timber Stand Improvement can improve habitat for prey and lead to more abundant prey
Livestock Management: should maintain adequate cover for prey species
Plant Native Grasses and Forbs: where additional early successional cover is needed for prey and planting is necessary
Plant Shrubs: in areas where additional shrub cover is needed to attract prey and provide security cover for coyotes
Set-back Succession: Prescribed Fire, Disking, Chaining, and Herbicide Applications are recommended to maintain herbaceous openings; Prescribed Fire can be used to enhance forest understory structure and composition; Chainsawing can be used to create additional forest openings where necessary

Decrease Harvest: where hunting or trapping has limited population and additional coyotes are desired
Increase Harvest: through hunting or trapping where populations need to be lowered
Wildlife Damage Management: may be necessary where livestock or pet depredation is a problem
Wildlife or Fish Survey: track counts and camera surveys are used to estimate population trends
Eastern cottontail

General information
Eastern cottontails occur in the eastern half of the country. They prefer brushy cover interspersed with herbaceous openings. Eastern cottontails are also found in suburban areas, parks, golf courses, and stream corridors. Eastern cottontails are prey for the majority of carnivorous predators within its range. They are prolific breeders; females may have 7 litters per year, with 3 to 6 young per litter. This reproductive rate is required to perpetuate populations because 70 to 80 percent of all rabbits die each year.

Habitat requirements
Diet: forbs and grasses, browse, and soft mast from spring through fall; in winter, bark of shrubs and trees, as well as buds, grain, and browse
Water: necessary water obtained from diet
Cover: shrub cover, brushpiles, native warm-season grasses and forbs for loafing and escape cover; burrows are also used for denning and escape

Wildlife management practices
Control Nonnative Invasive Vegetation: where nonnative invasive vegetation is competing with native vegetation and limiting habitat for cottontails
Edge Feathering: to increase usable space around fields
Field Borders: to increase usable space around fields
Forest Management: Forest Regeneration (Clearcut), provides optimal brushy cover for a few years
Leave Crop Unharvested: to provide additional food and cover, especially corn, alfalfa, and wheat
Livestock Management: should exclude livestock from food plots and prevent overgrazing to allow sufficient herbaceous vegetation for nesting, cover, and forage
Plant Food Plots: where additional forage or grain is needed; best situated adjacent to dense brushy cover
Plant Native Grasses and Forbs: where early successional cover is limiting and planting is required to promote additional grasses and forbs
Plant Shrubs: in relatively large openings with few shrubs; field borders, fence rows, and other idle land areas are good places to plant
Set-back Succession: Prescribed Fire, Disking, and Herbicide Applications are recommended to maintain herbaceous openings, especially when litter accumulation or woody encroachment is excessive; Chaining, Prescribed Fire, and Herbicide Applications can be used to rejuvenate shrublands, especially where herbaceous groundcover is shaded out; in areas dominated by mesquite, Chainsawing and Root-plowing can be used to convert forest cover to early successional communities
Tillage Management: cropland tillage may be delayed in spring to allow use of standing stubble for cover; tillage may be eliminated in the fall to allow access to waste grain Decrease Harvest: may be necessary when additional rabbits are desired and hunting or trapping efforts are limiting growth; low rabbit populations are almost always a result of inadequate habitat, not harvest levels
Increase Harvest: where populations can sustain additional hunting or trapping pressure for recreation or where populations need to be lowered
**Wildlife Damage Management**: shooting, trapping, and exclusion techniques can be used where there is damage to ornamental and garden plants

**Wildlife or Fish Survey**: observation counts, track counts, hunter harvest data, and transect flush counts can be used to estimate population trends

**Mowing**: can be used to maintain herbaceous openings in Urban areas
Eastern fox squirrel

General information
The eastern fox squirrel is found in the eastern half of the U.S., except for areas of New England. Eastern fox squirrels use mature forest interspersed small openings, as well as oak and pine woodlands and savannas. Riparian areas are important in the Midwest. Fox squirrels also may use urban areas where there are lots of trees. Fox squirrels spend much time foraging on the ground. They build a leaf nest, usually in the crotch of the main trunk of a tree more than 30 feet aboveground, but will regularly use natural cavities in trees, especially in winter.

Habitat requirements
*Diet:* a variety of hard mast, acorns, seeds, tree buds and flowers, mushrooms, soft mast, eggs, and corn
*Water:* necessary water is generally obtained through diet, but free-standing water may be needed in late summer
*Cover:* mature hardwood and pine forest, woodland, and savannas; nest in tree cavities or build a nest of twigs and leaves

Wildlife management practices
*Control Nonnative Invasive Vegetation:* when nonnative invasive vegetation begins to reduce habitat quality for eastern fox squirrels; kudzu, nonnative sod grasses, cogongrass, bush honeysuckles, Japanese stiltgrass may be particularly problematic in some areas
*Edge Feathering:* can enhance forest structure and increase food availability in forested areas surrounding fields
*Forest Management:* Forest Regeneration (Single-tree Selection, Group Selection) may improve forest or woodland structure and increase food availability; Timber Stand Improvement can encourage larger crowns of mast-producing trees and enable oaks, hickories, beech, and others to produce more mast; can also increase soft mast availability and provide snags for potential den sites
*Leave Crop Unharvested:* (corn fields) so squirrels can glean waste grain from the field; especially important during years of poor mast production
*Livestock Management:* should prevent overgrazing, especially in savannas and woodlands where grazing is allowed; livestock should be excluded from riparian areas, especially in open landscapes where tree cover is limited to riparian areas
*Plant Food Plots:* grain food plots, especially corn, can provide an important food source, during winters with poor mast availability
*Plant Trees:* in large open areas where tree cover is limiting
*Set-back Succession:* Prescribed Fire is required to maintain savannas and woodlands; Prescribed Fire and Disking are used to maintain relatively small early successional openings; Herbicide Applications can be used to reduce unwanted tree cover or woody encroachment
*Tillage Management:* eliminate tilling corn fields in the fall to provide additional food
*Water Developments for Wildlife:* in urban areas, a pool or pan of water may be used if water is not available
*Decrease Harvest:* may be necessary when additional fox squirrels are desired and hunting pressure is limiting growth.
*Increase Harvest:* where populations can sustain additional hunting pressure for recreation and where
populations need to be lowered

*Wildlife Damage Management*: exclusion from buildings, trapping, or shooting may be necessary if damage is occurring

*Wildlife or Fish Survey*: observational surveys are most often used to estimate population trends

*Artificial Feeders*: in urban areas, corn or sunflower seeds spilled from feeders onto the ground may be eaten
Greater roadrunner

General information
The greater roadrunner is a long legged bird, 20 to 24 inches in length, with a wingspan of 17 to 24 inches. Adults have a bushy crest on their heads and a long, thick, dark bill. They are called roadrunners because of their habit of running down the road and darting to safety into underbrush and trees adjacent to the road. They can run up to 20 mph to chase down prey. They will beat larger captured prey items against the ground or a rock to kill them. Although they are capable of flying, roadrunners spend most of their time on the ground. Threats to roadrunners include predation by feral cats, urbanization, and habitat loss.

Habitat requirements
Diet: omnivorous; principal food items include insects, fruits, and seeds, but small reptiles, mammals and birds, bird eggs, and carrion is also eaten; some quail hunters believe roadrunners kill and eat recently hatched quail chicks, but that has never been documented.
Water: water is largely obtained from diet, but roadrunners will drink free-standing water if available
Cover: arid deserts to semi-arid shrubby areas; open or disturbed areas adjacent to shrubland; in the eastern portion of their range, roadrunners inhabit dry sandy upland sites with patches of bare ground interspersed with low-growing brush, shrubs, and trees.

Wildlife management practices
Control Nonnative Invasive Vegetation: when invasive nonnative grasses and shrubs begin to compete with native plant cover and degrade habitat
Forest Management: in the eastern forested portion of the greater roadrunner’s range, Timber Stand Improvement can encourage shrub cover can enhance cover and support food where understory vegetation has been shaded out
Plant Shrubs: low-growing shrubs can provide cover and food where lacking
Set-back Succession: Prescribed fire, Disking, Herbicide Applications, Chainsawing, Chaining, and Drum-chopping can be used to renovate or maintain shrubby cover when trees begin to dominate or where additional bare ground is needed
Wildlife or Fish Survey: roadside counts can provide an index to roadrunner populations
Largemouth bass

**General information**
Largemouth bass are not really bass but members of the Sunfish family. Largemouth bass are the most popular freshwater sportfish in states where they are found. They can be found in freshwater lakes, rivers, large streams, farm ponds, and brackish marshes.

**Habitat requirements**
*Diet:* young bass eat insects and other invertebrates (worms, crayfish and zooplankton); adults eat small fish, such as bluegill, and a variety of minnows, as well as tadpoles, crayfish, and even ducklings
*Cover:* submerged rocks, woody debris and near aquatic vegetation where small fish (prey) hide
*Water:* basic requirements include dissolved oxygen (minimum of four parts per million); pH should range between 6.5 and 9.0; water temperature should reach at least 70°F during summer (one foot below surface in shade)

**Wildlife management practices**
*Livestock Management:* livestock should either be excluded from fish ponds or only allowed access to a small part of the fish pond; livestock watering facilities should be developed away from the fish pond
*Repair Spillway/Levee:* if not functioning properly
*Water Control Structures:* should be installed if none are present so water depth can be controlled
*Decrease Harvest:* refer to wildlife management practices for specifics on fish harvest
*Increase Harvest:* refer to wildlife management practices for specifics on fish harvest
*Wildlife or Fish Survey:* fishing records, seining, and electro-shocking are used to survey largemouth bass populations
*Construct Fish Pond:* where no suitable water source is present or where an existing fish pond needs extensive repair, especially to the dike or dam
*Control Aquatic Vegetation:* when necessary to discourage rooted aquatic vegetation
*Fertilize/Lime Fish Pond:* fertilize to promote phytoplankton growth when visibility is more than 18 inches below the water surface; add agricultural limestone to increase soil pH if total alkalinity is below 20 ppm
*Reduce Turbidity in Fish Pond:* by reseeding watershed if soil is eroding into the pond and causing muddy water, by preventing livestock from entering pond, by eliminating bottom-feeding fish, or by reducing suspension of negatively charged clay particles
*Restock Fish Pond:* if the population is too far out of balance to correct via seining or fishing or if undesirable species are present
*Streams: Create Pools:* in streams lacking slow water, add features such as rocks, logs, and dikes to create pools to provide structure for aquatic plants, insects, and locations for spawning; be cautious that “improvements” do not increase bank erosion.
*Streams: Remove Fish Barriers:* dams or other barriers restrict fish movement during weather extremes (e.g., drought, freezing cold); improve survivability by allowing fish movement to deeper pools or rivers.
Loggerhead shrike

General information
The loggerhead shrike is a migratory bird of prey that requires relatively large openings or fields to hunt prey. Some shrikes remain in the southern tier of the U.S. all year, whereas others migrate from as far south as northern Mexico to southern Canada to breed.

The loggerhead shrike population is declining because of habitat degradation and loss from conversion of grasslands and shrublands to row-crop agriculture or overgrazed, nonnative grass pastures, and aesthetic mowing. The most important vegetation component is nesting cover (dense, thorny shrubs and trees). Areas with herbaceous vegetation and some bare ground are also critical for hunting prey. Shrikes will readily build nests and perch in shrubby areas less than 16 feet tall, but prefer taller trees where available. Scattered, thorny tree and shrub species, such as honey locust, are selected over non-thorny species. Taller trees are selected for perching during courtship displays and while hunting. Loggerhead shrikes uniquely utilize thorns, barbs, and barbed wire fences to impale prey.

Habitat requirements
Diet: insects and spiders, small mammals, small birds, reptiles, and amphibians
Water: water requirements are obtained through diet
Cover: nest in dense shrubs and trees; taller, thorny species are preferred; courtship sites are elevated, exposed perches over open areas; foraging sites are elevated, exposed perches over open areas with herbaceous vegetation and some bare ground; evergreens may be used in winter when available

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative species are beginning to compete with native vegetation and reduce habitat quality for loggerhead shrike
Edge Feathering: to increase shrub cover around fields
Field Borders: to increase usable space around row-crop fields
Livestock Management: grazing should be managed to provide lush herbaceous groundcover and shrub cover
Plant Native Grasses and Forbs: when necessary to provide herbaceous vegetation in proximity to shrub cover
Plant Shrubs: where there is a lack of shrubs for nesting/perching sites
Plant Trees: where there is a lack of trees for nesting/perching sites
Set-back Succession: Disking and Prescribed Fire are recommended to maintain early successional openings; Chainsawing can reduce tree cover in forests to promote savanna conditions; Herbicide Applications may be used to reduce tree cover; Chaining and Drum-chopping may be used to maintain shrub cover
Wildlife or Fish Survey: walking transects to find nests, point counts, and breeding bird surveys can monitor population trends
Mourning dove

General information
Mourning doves prefer areas of annual and perennial grasses and forbs for feeding with some shrubs and trees nearby for perching, nesting and roosting. Interspersed bare ground is an important component of foraging sites because mourning doves do not scratch in the litter to find seed. Bare ground is also beneficial for doves to obtain grit (small gravel) to help in digesting food. Nests are made of twigs and placed on branches of shrubs or trees. Nests are also placed on the ground. Mourning doves often use agricultural areas for feeding on a variety of grass and forb seeds. They also forage on waste grain from cropland and livestock feedlots. Mourning doves prefer shallowly sloping or flat shorelines without vegetation for drinking.

Habitat requirements
Diet: a variety of grass and forb seeds, as well as several agricultural grains; small areas of bare ground are beneficial for obtaining grit (small gravel) to help digest food
Water: free-standing water required daily
Cover: shrubs and trees are used for nesting and loafing

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative invasive vegetation begins to compete with native vegetation and reduce habitat quality for mourning dove; sod grasses, such as tall fescue and bermudagrass, are particularly problematic because they have no food value and their structure at ground level limits mobility of ground-feeding doves and their ability to search for seed
Delay Crop Harvest: (in some ecoregions) in spring to avoid nest destruction
Leave Crop Unharvested: for a variety of small grain crops, such as wheat, millets, grain sorghum, corn, and oats, to provide additional food resource
Livestock Management: should prevent overgrazing, which can eliminate preferred forbs that produce seed for mourning dove; in some cases, livestock can be used to reduce vegetation height and increase bare ground; livestock should be excluded from food plots
Plant Food Plots: grain plots may be planting in areas where food is lacking and to facilitate recreational hunting
Plant Native Grasses and Forbs: where food may be limiting, especially to increase some of the many native forbs that are extremely important sources of seed for mourning dove
Plant Shrub: (in some ecoregions) to provide nesting, roosting, and loafing sites in areas where shrub/tree cover is limiting
Plant Trees: (in some ecoregions) to provide nesting, roosting, and loafing sites in areas where shrub/tree cover is limiting
Repair Spillway/Levee: if not functioning properly
Set-back Succession: Disking, Prescribed Fire, and Herbicide Applications can be used to maintain annual forbs and grasses and provide bare ground; Chaining, Drum-chopping, Root Plowing, Herbicide Applications, and Prescribed Fire may be used to reduce shrub cover; Chainsawing and Root Plowing may
be used to remove trees and clear forests and promote early successional plant communities. **Tillage Management:** tillage may be eliminated in the fall to allow wildlife access to waste grain; tillage may be delayed in spring (in some ecoregions) to allow nesting in standing stubble (especially wheat)  
**Water Control Structures:** should be installed if none are present in existing dams or levees to allow water level manipulation  
**Water Developments for Wildlife:** where water is limiting, small ponds, shallow impoundments, guzzlers, and windmills may be created or installed to provide free-standing water  
**Wildlife or Fish Survey:** point counts and observation counts are commonly conducted to estimate trends in populations
Northern bobwhite

General information
The northern bobwhite is a stocky game bird about 6 inches tall. They are considered shrubland obligates, which means they depend on low-growing shrubby cover, but also use grasslands, fallow fields, and savannas and woodlands with well-developed groundcover for foraging, nesting, brooding, and loafing. Ideally, bobwhite habitat is composed of scattered patches of shrubby cover well interspersed with native grasses, forbs, and bare ground. Nests are on the ground, usually made of dead grass leaves, and often located at the base of a clump of native warm-season grasses, such as broomsedge and little bluestem. A typical clutch is about 12 eggs. Both the male and female may incubate nests, with nesting primarily occurring May through August.

Early successional areas dominated by forbs, such as ragweeds, are commonly used for brooding. Northern bobwhites eat a wide variety of seeds, leaves, and insects. Bobwhite chicks primarily eat insects during the first 6-8 weeks of life. Some agricultural crops can provide seasonal food for bobwhites, but they are not a substitute for diverse native plant communities. Northern bobwhite populations have been declining precipitously for more than 40 years. Habitat loss and degradation is the primary reason for the decline.

Habitat requirements
Diet: young quail eat insects and other invertebrates (such as spiders); adult quail eat a variety of seeds (especially legumes, ragweed, crotons, lespedeza, etc.), green vegetation (mostly forbs), invertebrates, various crops (corn, soybeans, wheat, millets, grain sorghum), and mast (such as acorns and blackberries)

Water: necessary water is obtained through the diet

Cover: shrub cover for escape and thermoregulation throughout the year; perennial native grasses for nesting; native forbs for brood rearing

Wildlife management practices

Conservation Easement: can protect critical habitat for this declining species in some ecoregions

Control Nonnative Invasive Vegetation: nonnative sod grasses, such as tall fescue and bermudagrass, are especially problematic as they limit bobwhite mobility and provide poor cover and structure; there are many other nonnative invasive species that can degrade habitat quality for northern bobwhite across their range

Edge Feathering: to increase usable space and increase escape cover around row-crop fields

Field Borders: to increase usable space around row-crop fields

Forest Management: in pine forests, Forest Regeneration, especially Clearcut and Seed Tree, will enhance habitat for a few years until regenerating pines close canopy; Timber Stand Improvement can be used to reduce tree density in pine stands down to 50 square feet of basal area and enhance habitat; see Set-back Succession for managing hardwood forests for bobwhite

Leave Crop Unharvested: to provide additional food through fall and winter; corn, soybeans, wheat, and grain sorghum are readily eaten
Livestock Management: grazing pressure should be managed so sufficient groundcover remains for nesting and brood rearing; grazing management should discourage a uniform structure of plants across the landscape; cattle grazing in combination with prescribed fire can mimic historic natural disturbance events; grazing management should maintain dense shrub cover in some areas; up to one-third of an area can be grazed more intensively to encourage annual forb production for brood rearing cover, assuming the same areas are not repeatedly grazed the same way; livestock should be excluded from food plots

Plant Food Plots: relatively small linear food plots (one-fourth acre) may be established adjacent to escape cover where food is a limiting factor (this is rare; shrubby cover for escape and forb cover with bare ground are more often limiting factors)

Plant Native Grasses and Forbs: where nesting and brood cover is limiting and planting is necessary to develop nesting and brooding cover (suitable nesting and brooding cover usually establishes naturally after undesirable plants are controlled and after tree cover is removed or thinned)

Plant Shrubs: where shrub cover is limiting; if shrub patches are within 50 to 75 yards of each other, additional shrub cover is not needed

Set-back Succession: Prescribed Fire is strongly recommended to maintain and rejuvenate grasslands, native prairie, shrublands, savanna, and woodlands; fire consumes dense litter, limits succession of woody species, and encourages herbaceous groundcover; Disking can be used to reduce litter build-up, encourage annual forbs and grasses, and provide increased bare ground; Chaining can be used to set-back shrub cover when it becomes too dense and tall; Chainsawing and Root Plowing may be used remove trees and convert hardwood forest to early succession or savanna; Herbicide Applications may be used to remove undesirable woody encroachment

Tillage Management: eliminate fall tillage to provide waste grain

Decrease Harvest: may be necessary if populations are declining in areas of good habitat and where hunting pressure has been excessive

Wildlife or Fish Survey: covey counts, whistle counts, point counts, and hunter harvest and observation data are used to estimate trends in populations
Raccoon

General information
Raccoons are found in a variety of vegetation types, but are usually most abundant near riparian areas and wetlands. They also are found in urban areas. Raccoons den in hollow trees, in burrows under stumps or brush piles, or in chimneys, attics, and crawl spaces of houses and buildings. They are omnivorous and eat a wide variety of foods. Raccoons can become pests in urban areas and wetlands (depredateing waterfowl nests). Raccoons also have been identified as major predators on game bird nests and young game birds.

Habitat requirements
**Diet:** crayfish, birds, eggs, small mammals, insects, lizards, snakes, worms, fish, carrion, grains, seeds, hard and soft mast, and foods prepared for human and pet consumption
**Water:** require water frequently during warm seasons
**Cover:** riparian areas, bottomland hardwoods, and along other wetlands; natural tree cavities are used for denning and daytime loafing; raccoons also den in ground burrows under stumps, brush piles, junk piles, old abandoned buildings, and rocky cliffs and ledges

Wildlife management practices
**Control Nonnative Invasive Vegetation:** when nonnative invasive vegetation begins to reduce habitat quality for raccoons
**Create Snags:** where denning sites are limited
**Edge Feathering:** to increase usable space for prey around fields
**Field Borders:** to increase usable space for prey around fields
**Forest Management:** Forest Regeneration (Clearcut, Shelterwood, Seed-tree, Group Selection, Single-tree Selection) and Timber Stand Improvement can stimulate soft mast production and cover for prey
**Leave Crop Unharvested:** especially cornfields adjacent to bottomland hardwoods and riparian areas
**Livestock Management:** livestock should be excluded from riparian areas and other wetlands; this may include development of livestock watering facilities in uplands to discourage congregation in and overuse of riparian areas
**Plant Food Plots:** annual grain food plots, especially corn, may be planted where food is limiting and where an increase in raccoon population is desired (this situation is exceptionally rare)
**Plant Shrubs:** where soft mast is lacking and to provide corridors across large open areas
**Plant Trees:** in riparian areas and adjacent to wetlands where few trees are present to maintain riparian corridors; maintain approximately 50 percent deciduous forest cover; also in large open areas where there are few trees
**Repair Spillway/Levee:** if not functioning properly.
**Set-back Succession:** Prescribed Fire is recommended to rejuvenate old decadent wetland vegetation; Prescribed Fire and Disking can maintain herbaceous openings; Prescribed Fire, Herbicide Applications, Chaining, and Root-plowing are recommended to rejuvenate decadent shrub cover.
**Tillage Management:** eliminate fall tillage of grain crop residue adjacent to cover to make waste grain available as an additional food source.
**Water Control Structures**: to control water levels and provide water less than 2 feet deep and stimulate emergent vegetation and enhance habitat for prey.

**Water Developments for Wildlife**: shallow impoundments can provide a water source and additional habitat for various prey species.

**Decrease Harvest**: if hunting pressure is limiting population growth where an increase is desired (this situation is rare)

**Increase Harvest**: where populations can sustain additional hunting or trapping pressure for recreation and where populations need to be lowered for various reasons

**Wildlife Damage Management**: is often necessary when raccoons get into garbage cans, occupy residences or buildings, or prey upon poultry; exclusion is cost-effective; cultural modification, such as using wildlife-proof trash cans, is effective; trap and euthanize is most effective for problem raccoons.

**Wildlife or Fish Survey**: track counts and camera surveys may be used to monitor population trends.
Red-cockaded woodpecker

General information
The red-cockaded woodpecker is about 7 to 8 inches in length and lives in mature pine forests across the South. (Wildlife biologists often refer to them as “RCWs”.) Historically, red-cockaded woodpeckers ranged from east Texas to Florida and northward to Missouri, Kentucky, and Maryland, but its range has been sharply reduced because of fire suppression and hardwood encroachment. The species was federally listed as an endangered species in 1970.

Red-cockaded woodpeckers can be distinguished from hairy woodpeckers by their white cheek patch. Males have a few red feathers or “cockade” on their head, which usually remain hidden unless the male is disturbed or agitated.

Red-cockaded woodpeckers have an unusual social organization. They live in a group called a clan. Each clan typically contains 2 to 9 birds, but there is never more than one pair of breeding birds. Some clans have non-breeding birds called helpers, which generally consist of male offspring 1 to 3 years of age that help incubate eggs, feed young, make new cavities, and defend the clan’s territory against other red-cockaded woodpeckers. A clan nests and roosts in a group of as many as 20 cavity trees (called a cluster).

Red-cockaded woodpeckers have very specific habitat requirements. Cavity trees are live pine trees, rarely less than 30 to 40 years old and are often more than 70 years old. Older pines inflicted with red-heart fungal disease makes it easier for red-cockaded woodpeckers to excavate cavities.

Habitat requirements
Water: necessary water is obtained through diet
Diet: ants, beetles, roaches, caterpillars, wood-boring insects, spiders, and occasionally fruits and berries
Cover: mature stands of Southern yellow pines, especially longleaf and shortleaf; relatively open stands with very little midstory and a diverse herbaceous understory are most desirable for foraging; a cluster site is the stand of trees surrounding and containing cavity trees and should be at least 100 acres

Wildlife management practices
Conservation Easement: can protect pine systems for this declining species
Control Nonnative Invasive Species: when nonnative species begin to compete with native vegetation and reduce habitat quality for red-cockaded woodpeckers
Forest Management: Forest Regeneration (Single-tree Selection) is the preferred method to regenerate and manage pine; Timber Stand Improvement can be used to thin pine stands, especially shortleaf and loblolly pine, and thus enhance structure for foraging
Nesting Structures: artificial cavity inserts can be installed into mature pine trees at cluster sites where cavity trees are limiting
Plant Trees: loblolly and shortleaf pine can be planted where lacking to provide habitat for red-cockaded woodpeckers; this may be where there are large open areas or where hardwoods dominate
**Set-back Succession:** Prescribed Fire is required to reduce hardwood encroachment, limit midstory development, and encourage herbaceous groundcover; Chainsawing and Herbicide Applications may be necessary where hardwoods have become too large to effectively reduce with fire; Chainsawing, Herbicide Applications, and Root Raking and may be used to clear sites and prepare for planting longleaf or shortleaf pine

**Wildlife or Fish Survey:** observational counts and cluster monitoring are used to monitor red-cockaded woodpeckers
Red-eyed vireo

General information
The red-eyed vireo is a common migratory songbird found in mature deciduous forests throughout eastern North America and the upper Midwest. They are also found in forested urban parks. They are more often heard than seen, with their persistent song that sounds like they are saying “where-are-you, here-I-am, over-here.”

Red-eyed vireos have olive-green backs with a pale breast and dark red eyes. Red-eyed vireos usually forage in the middle to upper layer of the forest canopy, but often nest in the understory or midstory. The nest is made of twigs, bark, and grasses, usually in an open cup shape and suspended from a branch. They eat insects and fruits.

Habitat requirements
Diet: mostly insects and spiders during spring and summer; more soft mast during winter
Water: necessary water is obtained from diet
Cover: midstory and overstory of mature mixed deciduous forest

Wildlife management practices
Control Nonnative Invasive Vegetation: when it begins to reduce habitat quality for red-eyed vireos; a common example in the South is kudzu, which can reduce forest cover by overtaking and killing trees
Forest Management: Forest Regeneration (Single-tree Selection and Group Selection) can encourage insect and soft mast availability; Timber Stand Improvement (light thinning) can also stimulate understory and midstory development to enhance nesting cover in relatively open woods and encourage additional soft mast availability
Plant trees: in large open areas, trees may be planted to provide future habitat
Wildlife or Fish Survey: point counts are most often used to estimate population trends
Red-tailed hawk

**General information**
Red-tailed hawks are one of the most abundant hawks in the U.S. They are large raptors with a pale breast, brown back, and red-topped tail, for which they are named. They usually have a dark band across their breast, but the overall plumage can vary. Red-tailed hawks are often seen soaring or perching near open grasslands, pastures, and fields where they search for prey. They dive and catch prey with sharp talons. Red-tailed hawks most often nest in tall trees where they have a good view of the surrounding land. Nests are primarily made of dry sticks that can create piles over 6 feet tall. A pair will continue to build upon nests where 1 to 5 eggs are subsequently laid.

**Habitat requirements**
*Diet:* small mammals, such as squirrels, rabbits, and mice, reptiles, and other birds  
*Water:* necessary water is obtained from diet  
*Cover:* nests are usually built 30 to 90 feet above ground, often in the fork of a tree branch; cliffs may be used for nest sites when trees are not present; small trees, electric poles, and similar structures are used for perching

**Wildlife management practices**
*Control Nonnative Invasive Vegetation:* when nonnative invasive vegetation begins to compete with native vegetation and degrade habitat for red-tailed hawks or their prey  
*Create Snags:* in open areas where live trees are available and perching sites could be enhanced  
*Crop Harvest:* (in some ecoregions) to provide additional food for prey and thus increase potential for increased prey  
*Edge Feathering:* to increase usable space for prey, especially around row crop fields  
*Field Borders:* to increase usable space for prey, especially around row crop fields  
*Forest Management:* Forest Regeneration (Clearcut) to improve habitat for prey and increase usable space for red-tailed hawks in large expanses of mature forest  
*Plant Native Grasses and Forbs:* to enhance early successional cover where limiting and where planting is necessary  
*Plant Shrubs:* in large open areas where trees and shrubs are not present to create perching sites and provide cover for various prey species  
*Plant Trees:* (in some ecoregions) in large open areas where trees are not present to create perching and nest sites  
*Set-back Succession:* Prescribed Fire, Disking, and Mowing may be used to maintain early successional communities for various prey species; Chaining, Root Raking, and Drum-chopping may be used to set-back succession in areas dominated by shrubs where more open space is needed

*Tillage Management:* to facilitate hunting prey when waste grain is available  
*Wildlife Damage Management:* such as exclusion and fencing, may be necessary where livestock predation, such as chickens, is problematic  
*Wildlife or Fish Survey:* observational surveys are used to estimate population trend
Western diamond-backed rattlesnake

General information
Western diamond-backed rattlesnakes are found in deserts, grasslands, shrublands, and woodlands of the southwestern United States. They are pit vipers, having a heat-sensing organ beneath the nostrils that can detect temperature differences, which the snake uses to determine if another animal is a predator or prey.

Western diamond-backed rattlesnakes usually spend daylight hours in the shade of low-growing shrubs, debris piles, or rocks. They are most active around sunrise and sunset, and at night during summer. The rattle is made of the protein keratin and a new segment is added each time the snake sheds. A rattlesnake cannot be aged by counting the rattle segments because snakes shed at varying rates, often multiple times in one year, and rattle segments commonly break-off. To rattle, rattlesnakes move the rattle back and forth as much as 40-60 times per second. Western diamond-backed rattlesnakes are venomous and should not be handled.

Habitat requirements
_Diet_: mostly mammals (rabbits, squirrels, mice, and rats), but also lizards and birds
_Water_: will consume their body weight in free-standing water annually; they also get water from their food and some is absorbed during shedding.
_Cover_: areas with grass, forbs, cactus, or scattered shrubs; areas with sandy to rocky soils may provide animal burrows and rocky crevices used for cover

Wildlife management practices
_Control Nonnative Invasive Vegetation_: when nonnative invasive vegetation begins to reduce habitat quality for western diamond-backed rattlesnakes; in particular, nonnative sod grasses should be eradicated
_Plant Native Grasses and Forbs_: when grass/forb cover is limiting and planting is necessary
_Plant Shrubs_: in large open areas where additional shrub cover is needed to provide daytime loafing areas and attract prey
_Set-back Succession_: Prescribed Fire is recommended to maintain diverse grasslands and rejuvenate shrublands that have become too dense to allow sufficient herbaceous groundcover; Drum-chopping also can be used to rejuvenate shrublands; it is important these practices occur during the inactive season to minimize negative effects on snakes
_Wildlife Damage Management_: it may be necessary to remove western diamond-backed rattlesnakes from around human dwellings; debris piles attract prey, and thus snakes, making it desirable to keep such debris away from houses and buildings
_Wildlife or Fish Survey_: transect surveys are used to estimate population trends
White-tailed deer

General information
The white-tailed deer is the most important game animal in North America. There are more than 30 subspecies of white-tailed deer that occur throughout the U.S. and southern Canada, except for California and Nevada. They are extremely adaptable and are found in a wide variety of areas including deciduous and coniferous forests, tropical evergreen forest, dry grasslands, and shrub desert. They are adaptable to humans and exploit suburban areas very well. Whitetails thrive in areas with fragmented habitat containing several well-interspersed vegetation types. White-tailed deer are ruminants and are classified as browsers, but have distinct dietary preferences through the seasons. Where overabundant, they can cause significant damage to ornamental plantings and row crops and can be hazardous for motor vehicles.

Habitat requirements
Diet: forbs, browse, acorns, beechnuts, grains, grasses, and mushrooms; in the northern parts of the range, coniferous browse is important in winter
Water: obtain most of their water from diet, but will drink free-standing water when available
Cover: dense woody vegetation as well as relatively tall early successional cover, including native grasses, forbs, and shrubs

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative invasive vegetation begins to reduce habitat quality for white-tailed deer; sod grasses and sericea lespedeza can be particularly problematic in fields and Japanese stiltgrass often reduces forage availability in forests; although white-tailed deer may eat many nonnative invasive plants in some seasons to some extent, control of many of those plants, such as kudzu, Japanese honeysuckle, and Chinese privet, can lead to increased plant species diversity and increased forage quality during various seasons
Edge Feathering: to increase forage availability around fields and enhance fawning cover
Field Borders: to increase forage availability (forbs and brambles) around crop fields
Forest Management: Forest Regeneration (Clearcut, Shelterwood, Seed-tree, Group Selection) will provide increased browse, soft mast production, and dense escape cover; Timber Stand Improvement can provide increased browse and soft mast production and stimulate better cover in stands with a poorly developed understory
Leave Crop Unharvested: to provide additional food resource, especially near escape cover Livestock Management: livestock should be excluded from forests managed for deer to avoid destruction of the forest understory; livestock should be excluded from riparian areas, especially in the Great Plains Grassland Ecoregion; should prevent overgrazing in woodlands and savannas
**Plant Food Plots:** when naturally occurring food sources are limited, food plots may provide additional nutrition, particularly in late summer and winter of most ecoregions

**Plant Native Grasses and Forbs:** where early successional cover is limiting and planting is necessary for establishment

**Plant Shrubs:** where needed to provide additional soft mast, brushy cover, and browse; ravines, field borders, other idle land areas and across large open areas to provide travel corridors

**Plant Trees:** in large open areas to maintain at least 30 to 40 percent forest cover; where mast producers are lacking, particularly oaks

**Set-back Succession:** *Prescribed Fire and Disking* is recommended to maintain herbaceous openings; *Prescribed Fire* is recommended to stimulate the forest understory for increased forage and soft mast; *Chaining* can be used to rejuvenate shrub cover; in areas dominated by mesquite, *Root-plowing* combined with seeding grasses and legumes may be the best way to increase herbaceous groundcover; *Chainsawing* and *Root-plowing* when converting forest to early successional cover to increase forage and enhance fawning cover

**Tillage Management:** eliminate fall tillage of grain crop residue adjacent to cover to make waste grain available as an additional food source

**Water Developments for Wildlife:** where lacking (within one-half mile), dugouts, ponds, and shallow impoundments can provide free-standing water

**Decrease Harvest:** if hunting pressure is limiting population growth where an increase is desired

**Increase Harvest:** when populations can sustain additional harvest pressure for hunting recreation and when populations need to be lowered because of overpopulation and habitat degradation; in these cases, it is necessary to concentrate increased harvest on females

**Wildlife Damage Management Techniques:** fencing, repellents, and scare tactics may be helpful to keep deer from ornamental plantings, vegetable gardens, and crops; reducing the population through shooting is recommended when widespread overabundance is causing crop depredation and increasing vehicle collisions

**Wildlife or Fish Survey:** camera surveys, browse surveys, and hunter observation and harvest data are used to estimate population trends
Wild pig

General information
Wild pigs (feral hogs, wild boars, razorbacks) were first introduced into what is now the United States at Tampa Bay, Florida by the explorer Hernando de Soto in 1539. In addition, early settlers throughout the southeastern United States also raised domesticated swine, some of which escaped and became feral, leading to their establishment throughout the South and California. Today, 36 states have wild pig populations estimated between 5 and 8 million nationwide. Many of these populations became established because of indiscriminant and illegal stockings for hunting purposes. As an invasive nonnative species, wild pigs cause ecological damage via their rooting behavior and competition for food and space with a number of native wildlife species and predate upon many small amphibian and reptile species. Wild pigs also cause considerable agricultural damage to crops, pastures, livestock, and environmental damage to riparian areas, often resulting in water quality degradation as a result of their rooting and wallowing behavior.

Habitat requirements
Diet: Wild pigs are perhaps the perfect example of an omnivore; approximately 85 percent of their diet is vegetation, but they also prey upon small animals and often scavenge animal carcasses; they especially prefer crops, such as corn and peanuts, and aggressively out-compete native wildlife species for hard and soft mast whenever those food items are available
Water: wild pigs must have access to free-standing water for drinking and thermoregulation
Cover: wild pigs seek dense cover, such as heavy understory or thick shrubs and grasslands, near or in riparian areas that reduce opportunity for human contact; pig family groups (called sounders) often use streams, rivers, creeks, and associated wetlands as travel corridors to move as they seek food sources

Wildlife management practices
Increase Harvest: the wild pig is an invasive nonnative species that competes with native wildlife for food and in some instances preys directly upon many small vertebrate species, including birds, mammals, reptiles, and amphibians; whenever wild pigs are observed or their sign is documented, control methods, such as trapping, snaring, shooting, and dogging, should be used with an ultimate goal of eradication
Wildlife Damage Management: may be necessary if wild pigs negatively impact crops, forages, or livestock; fencing high-value crops and other areas may be used as a non-lethal method for reducing wild pig damage, but it does not decrease the population
Wildlife or Fish Survey: camera surveys, track counts, and evidence of rooting are used to estimate population trends
Wild turkey

General information
Wild turkeys are large game birds found across the U.S. They are adapted to use a wide variety of vegetation types, from deciduous forest to desert shrub to open grassland interspersed with tree-lined riparian areas. Their distribution is largely limited only by trees or large shrubs needed for roosting at night. Although wild turkeys spend most of their time on the ground, except when the fly up into trees in the evening to roost for the night, they can fly well and often take flight for short distances to escape possible predation.

Breeding occurs in spring when males gobble to attract females. Nests are a slight depression on the ground, usually placed adjacent to a log, shrub, or some other structure to aid in concealment. Shrub cover is often used for nesting, but wild turkeys also nest in open woods and in fields. Nests are lined with leaves and other vegetation and usually contain about 12 eggs. Poults (young turkeys) are precocial, meaning they are able to walk around with the hen and forage for themselves soon after hatching. Herbaceous openings, especially those with a forb canopy and open ground structure, are preferred for brooding. Wild turkeys flock together during fall and winter.

Habitat requirements
Diet: extremely varied; hard mast, especially acorns and beechnuts in the fall and winter; soft mast, such as blackberries, mulberries, and black cherry; insects and other invertebrates, including spiders and snails, are especially important for young poults and hens prior to nesting; miscellaneous seeds; leaves from forbs and grasses; grain from a variety of agricultural crops
Water: obtain water from diet, but may use free-standing water when available
Cover: mature forest, regenerating forest, brushy areas, and old-fields for nesting; mature forest; herbaceous openings; grain fields for foraging; trees or tall shrubs for roosting

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative invasive vegetation begins to reduce habitat quality for wild turkeys; common examples include sod-grasses, such as tall fescue, bermudagrass, and others, such as cogongrass, which limit mobility for turkey poults and food availability; kudzu and shrub honeysuckles are other species that often degrade habitat in forested areas
Edge Feathering: can enhance nesting and brooding cover around fields
Field Borders: to increase usable space for nesting and brooding around row crop fields
Forest Management: Forest Regeneration (Clearcut, Shelterwood, Group Selection, Seed-tree) can enhance nesting and brooding cover and stimulate increased soft mast and miscellaneous seed for a few years after harvest; Timber Stand Improvement can improve the structure of the understory for nesting and brood rearing, increase production of soft mast and miscellaneous seed, and enable crowns of desired trees to grow and produce additional mast
Leave Crop Unharvested: especially corn, soybeans, and grain sorghum, to provide supplemental food source during fall and winter
**Livestock Management:** should prevent livestock from degrading habitat by overgrazing and damaging planted trees and shrubs

**Plant Food Plots:** to provide supplemental foods where food may be limiting or increase carrying capacity where increased wild turkeys is desirable; corn, soybeans, wheat, and clovers are often used

**Plant Native Grasses and Forbs:** where herbaceous cover is limiting and planting is necessary

**Plant Shrubs:** where additional soft mast or brushy cover is needed

**Plant Trees:** where additional hard mast production, especially acorns, is needed and where roosting sites are limited

**Set-back Succession: Prescribed Fire** is recommended to maintain herbaceous openings, rejuvenate shrubland, and improve understory structure and composition for foraging, brooding, and nesting in forests, woodlands, and savannas; **Disking** can be used to maintain herbaceous openings and reduce thatch build-up; **Herbicide Applications, Chaining, Root Plowing,** and **Drum-chopping** can be used to reduce shrub cover and stimulate more herbaceous groundcover; **Chainsawing** can be used to remove trees and create herbaceous openings, especially where brooding cover may be limiting

**Tillage Management:** eliminate tillage in the fall to provide additional waste grain during winter, especially when adjacent to tall shrub or forest cover

**Water Developments for Wildlife:** can be useful when there is little or no free-standing water

**Decrease Harvest:** may be necessary if populations are declining in areas where hunting pressure has been excessive

**Increase Harvest:** where populations can sustain additional harvest pressure for hunting recreation and where populations need to be lowered

**Wildlife Damage Management:** may be necessary in rare instances when wild turkeys are depredating crops

**Wildlife or Fish Survey:** gobble surveys, poult surveys, and hunter success rates are used to estimate population trends
Yellow-rumped warbler

General information
Yellow-rumped warblers are relatively large warblers found throughout the U.S., Canada, and Mexico. They breed throughout southern Canada, the western U.S., the Great Lakes region, and the northeastern U.S in coniferous and mixed coniferous-deciduous woodlands. They winter throughout the southern U.S. using open areas, especially shrub cover with plentiful soft mast. Yellow-rumped warblers eat insects gleaned from the branches and bark of trees and shrubs, and may also catch insects on-the-fly.

Habitat requirements
Diet: various seeds and fruit during winter, such as bayberry, wax myrtle, juniper, poison ivy, greenbrier, grapes, Virginia creeper, and dogwoods
Water: necessary water obtained from diet, but free-standing water is used when available
Cover: brushy thickets are used for feeding, loafing, and escape during winter

Wildlife management practices
Control Nonnative Invasive Vegetation: when nonnative invasive vegetation begins to reduce habitat quality for yellow-rumped warblers
Forest Management: Timber Stand Improvement can improve forest structure for foraging
Livestock Management: should not allow overgrazing in wintering areas
Plant Shrubs: where shrub cover is lacking in winter range
Plant Trees: where forest cover is limiting
Set-back Succession: Prescribed Fire and Herbicide Applications can be used to maintain open areas with scattered shrub cover in wintering areas
Wildlife or Fish Survey: point counts are used to estimate population trends