

## House sparrow

### General information

House sparrows are found throughout the U.S. They are an introduced species from England (they are also called English sparrows) and are found throughout the U.S., and are very common in urban areas. House sparrows also are very common in and around buildings in agricultural areas where grain is available. Because they are a nuisance, management objectives are often needed to reduce the quality and quantity of food and cover. *Wildlife Damage Management* is often needed and commonly implemented. House sparrows are cavity nesters and will frequently occupy buildings and houses to nest within the eaves or other areas with a cavity or opening. House sparrows feed on the ground and in woody vegetation for seeds, insects, and soft mast. House sparrows outcompete bluebirds for cavity nesting space and compete with several other native birds for food and space.

### Habitat requirements

**Diet:** variety of insects, soft mast, buds, forbs, weed seeds, and waste grain

**Water:** free-standing water is required daily in warm seasons

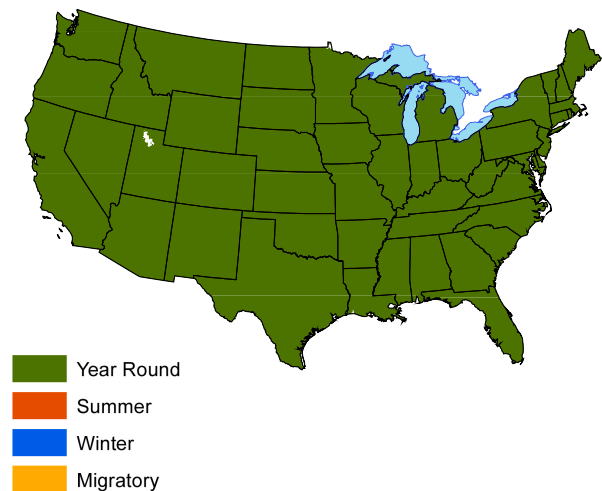
**Cover:** nest in natural cavities, low branches of trees, and bushes 5 feet to 7 feet aboveground, and on any projection or ledge they can find on buildings or other structures

### Wildlife management practices

House sparrow populations often grow to levels where they cause wildlife damage or will cause detrimental conditions for native wildlife by out competing native species for habitat requirements; therefore, wildlife damage management most likely will be necessary in all situations, especially in suburban/urban and agricultural areas. Habitat management to attract house sparrows should never occur.

**Wildlife Damage Management:** trap and euthanasia are often appropriate to reduce house sparrow populations; exclusion practices may prevent house sparrows from accessing an area; remove food, water, and cover available to house sparrows; various harassment practices may be effective

**Wildlife or Fish Survey:** observation counts, call counts, and questionnaires related to wildlife damage management are useful in estimating trends in populations



## House wren

### General information

House wrens are found throughout the U.S. during the breeding season, and migrate to the Deep South during winter months. In **Urban** areas, house wrens prefer older residential areas with large shrubs and trees. House wrens also are found in forests with herbaceous openings at higher elevations, as well as in aspen stands. House wrens nest in a variety of elevated cavities, as high as 30 feet aboveground. They forage both on the ground and aboveground.

### Habitat requirements

**Diet:** spiders, grasshoppers, crickets, beetles, caterpillars, ants, bees, ticks, earthworms, and millipedes; artificial feeders are usually not used

**Water:** necessary water is obtained from the diet

**Cover:** nest in natural cavities in trees old buildings and other structures

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative species begin to compete with native vegetation and degrade habitat for house wrens

**Nesting Structures:** nest boxes may be provided where adequate nesting sites are lacking; boxes should be placed high on a tree trunk or under the eaves of a house; the hole should be < 1.5 inches in diameter to prevent house sparrows and starlings from entering and excluding house wrens; for specifics on nest box design and placement, visit your local Extension office or state wildlife agency website

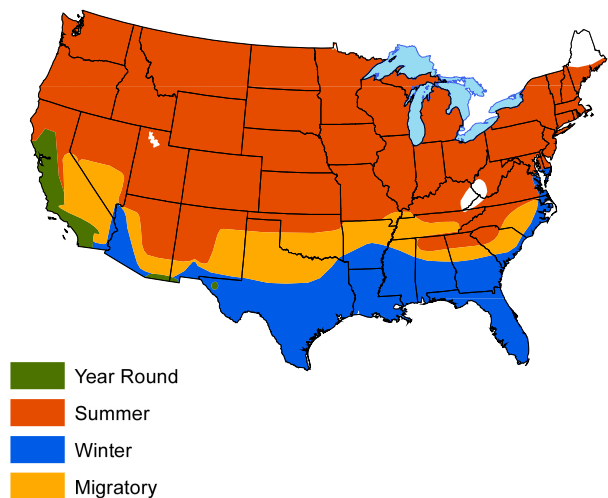
**Plant Shrubs:** where lacking for cover while feeding and for nesting

**Plant Trees:** where trees are lacking for cover and nesting

**Wildlife or Fish Survey:** point counts are used to estimate trends in populations



Dave Menke



## Ladder-backed woodpecker

### General information

Ladder-backed woodpeckers are small woodpeckers of the southwestern U.S. and Mexico. They get their name from the black and white barring on their backs that resemble a ladder. Ladder-backed woodpeckers are found in wooded canyons, cottonwood groves, pine and pine oak woodlands, and desert grasslands and shrublands dominated by mesquite throughout the southwestern U.S. south to British Honduras. They also are found in riparian areas and other areas with trees. In the Hot Desert and Prairie Brushland ecoregions, they use areas with large mesquite, palo verde, agave, cholla cactus, and yuccas. They are sometimes called the cactus woodpecker as they commonly nest in various cacti where they occur.

### Habitat requirements

**Diet:** insects including ants, beetle larvae, caterpillars, and cotton worms found on small trees, shrubs, and various cacti

**Water:** necessary water obtained from diet

**Cover:** nest in cavities in trees, shrubs, and stalks of agave and yucca cactus

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative invasive species begin to compete with native vegetation and degrade habitat for ladder-backed woodpeckers

**Create Snags:** to increase potential nesting sites where limiting

**Livestock Management:** grazing management should maintain vigor of existing trees; in riparian areas, grazing in spring and summer when herbaceous vegetation is actively growing results in less use of woody vegetation than at other times of year; grazing management in dry regions often includes development of livestock watering facilities in upland areas to discourage over-use of riparian areas

**Plant Trees:** in riparian areas for cover and a future food source where trees are lacking

**Wildlife Damage Management:** when woodpeckers are causing damage to human structures

**Wildlife or Fish Survey:** point counts may be used to monitor populations



Robert Burton





## Lark bunting

### General information

Lark buntings are found in the Great Plains and the arid Southwest. They prefer shortgrass prairies during the breeding season, but also are found in mixed grass prairies. They nest on the ground, usually under a shrub. Nests contain 2-6 eggs. Lark buntings feed on the ground in open areas, and avoid foraging under cover. Lark buntings migrate into the southern Great Plains and Mexico during winter where they frequent grasslands, deserts, shrublands, and cultivated fields.

### Habitat requirements

**Diet:** insects are the primary item in the diet, but seeds, soft mast, and grain are consumed as well, especially during winter

**Water:** necessary water is obtained from food

**Cover:** adequate grass cover is necessary, particularly during the nesting season

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative vegetation begins to compete with native vegetation and reduce habitat quality for lark buntings; sod grasses are problematic because they can limit mobility of lark buntings while foraging

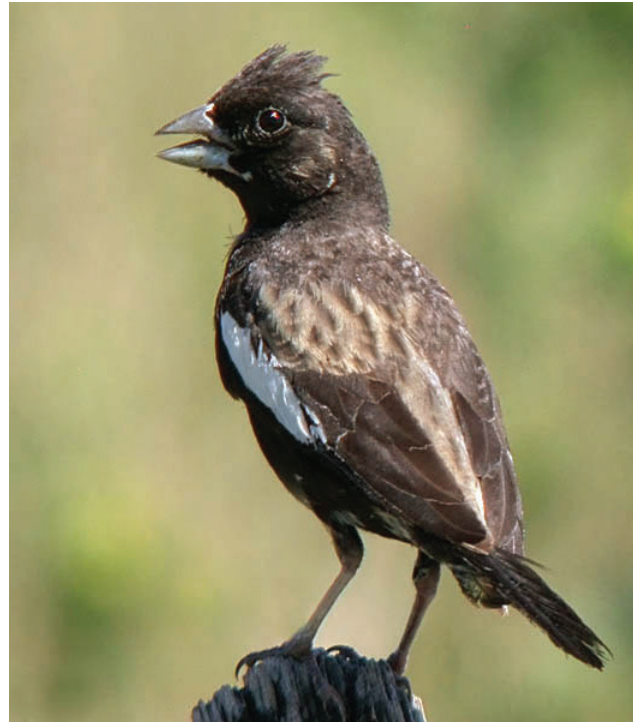
**Delay Crop Harvest:** delaying hay harvest until after nesting season can increase nesting success

**Livestock Management:** grazing should be managed so that adequate nesting cover is available

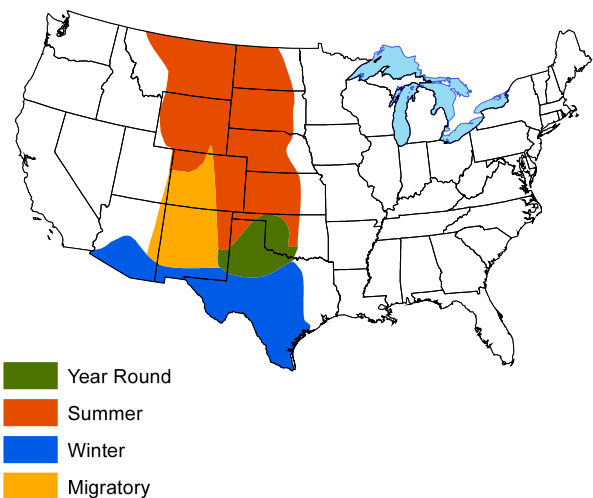
**Plant Native Grasses and Forbs:** may be necessary to restore native cover where native grasslands have been converted to nonnative species

**Set-back Succession:** *Prescribed Fire* is critical for maintaining native prairie for this and many other grassland birds; *Chainsawing* may be used to clear trees; *Herbicide Applications* may be used to kill trees; *Prescribed Fire*, *Chaining*, *Root-plowing*, and *Drum-chopping* may be used to set-back shrub cover and stimulate herbaceous groundcover

**Wildlife or Fish Survey:** point counts are used to monitor populations



James W. Arterburn





## Lawrence's goldfinch

### General information

Lawrence's goldfinch is a small and rather uncommon finch that spends the breeding season in the oak woodlands of California and Baja California and winters in southern Arizona and northern Mexico. Thus, unlike most other migratory birds, it migrates east and west, rather than north and south, between seasons. It is a nomadic species within seasons, moving about from place to place, with little predictability or loyalty in which location it will spend the breeding season from year to year. Erratic movements of the species make it difficult to monitor. Its nomadic nature is considered a response to water and food availability, which is largely seed of native annual plants that the goldfinch glean while perching on the plant. They nest about mid-way up trees; nests contain 3-6 eggs.

### Habitat requirements

**Diet:** seeds of annual plants, such as fiddleneck, chamise, red-stem filaree, shepherd's-purse, and peppergrass

**Water:** freestanding water is required; Lawrence's goldfinch may drink from streams, water tanks, dripping faucets

**Cover:** blue oak savannas, digger pine-oak woodlands, wooded riparian areas

### Wildlife management practices

**Conservation Easement:** can protect critical habitat for this declining species

**Control Nonnative Invasive Vegetation:** when nonnative invasive species compete with native vegetation and reduce habitat quality for Lawrence's goldfinch

**Forest Management:** *Forest Stand Improvement* can promote open-canopy conditions where closed-canopy conditions occur

**Plant Trees:** in large open areas where oak woodlands are lacking

**Set-back Succession:** *Disking* can promote annual plants for foraging; *Prescribed Fire* should be used to maintain and promote oak woodlands and savannas; *Herbicide Applications* may be used to reduce tree density where needed

**Soil Conservation Agriculture:** will allow annual forbs to remain standing through winter for foraging

**Water Developments for Wildlife:** may be useful where freestanding water is limiting

**Wildlife or Fish Survey:** point counts may be used in an effort to monitor population trends



Glen Tepke



## 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), but open 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 and 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

**Conservation Easement:** can protect critical habitat for this declining species

**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

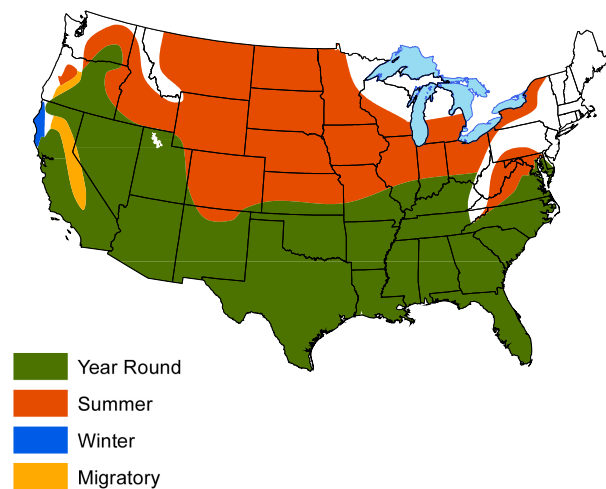
**Plant Native Grasses and Forbs:** when necessary to provide herbaceous vegetation in proximity to shrub cover

**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



Dave Menke



**Set-back Succession:** *Disking* and *Prescribed Fire* are recommended to maintain early successional openings; *Chainsawing*, *Dozer-clearing*, and *Root-ploving* 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

## Long-billed thrasher

### General information

The long-billed thrasher is only found in southern Texas and eastern Mexico where it prefers dense, brushy areas, such as riparian woodlands and mesquite thickets. Long-billed thrashers construct nests in big trees within thick brush, making nests difficult to find. Nests resemble a big cup made of thorny twigs. Long-billed thrashers are grayish brown on top with white below, characteristically streaked with black dashes. As the name implies, it has a longer bill than its close relative, the brown thrasher, which can be found in the same ecoregion. Interestingly, there are other thrashers with even longer bills. The long bill is used to forage or “thrash” in leaf litter on the ground for insects, spiders, snails, or berries. Although the long-billed thrasher is not threatened, parts of south Texas have seen a decline over the last century as a result of clearing brush for agriculture. Long-billed thrashers are most commonly seen along the Rio Grande River and have been noted to move to the more northern areas of south Texas during winter.

### Habitat requirements

**Diet:** insects and berries, but also spiders and snails

**Water:** water needs are likely met through their diet

**Cover:** areas of dense brush; nest in larger trees within areas of dense, thorny brush

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative invasive vegetation begins to reduce habitat quality for long-billed thrasher

**Field Borders:** of primarily shrubs can provide nesting and escape cover in areas lacking patches of dense brush

**Plant Shrubs:** in open areas where shrub cover is limiting and planting is necessary for shrub establishment

**Plant Trees:** can provide nesting structures where taller trees are lacking

**Water Developments for Wildlife:** water sources could be developed to provide free water, especially during winter months

**Wildlife or Fish Survey:** point counts are used to estimate population trends



Robert Burton





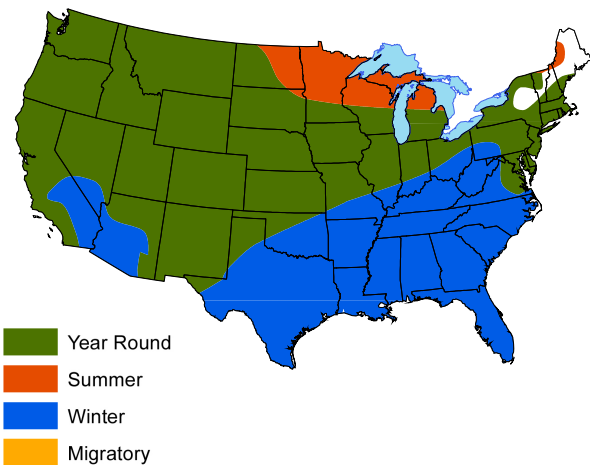
# Mallard

## General information

The mallard is a migratory waterfowl with one of the most extensive breeding ranges of any duck in North America, extending across the northern one-third of the U.S., and up to the Bering Sea. Mallards winter south of Canada, throughout the U.S. and south to Central America. Mallards nest in tall grasses and forbs or in shrubby cover. They need open water with associated emergent aquatic vegetation to raise young. They may be found in any type of wetland with standing water and also use various upland vegetation types for foraging, especially harvested grain fields. Mallards are dabbling ducks, which means they feed at or near the surface of the water by filtering food items, such as invertebrates, seeds, and other plant material. Dabbling ducks are often seen tipping upside down in the water to reach food at the bottom of a wetland. Unlike diving ducks, they feed in much shallower water and do not dive to obtain food. Mallards have become a nuisance in some areas, particularly urban and suburban parks with ponds where they are fed. Mallards may breed with domestic ducks and with other wild duck species, especially the American black duck.



Donna Dewhurst



## Habitat requirements

**Diet:** aquatic plants, insects and other invertebrates, hard mast (especially acorns), grains and other seed are primary components in the diet; ducklings eat mostly aquatic insects

**Water:** see cover requirements below

**Cover:** nest in grass and forbs and sometimes in shrub cover, preferably within one-half mile of a wetland that provides open water with some emergent aquatic vegetation; brooding cover is open water with considerable emergent aquatic vegetation for protection from predators; ideally, wetlands have a minimum of 50 percent open water and 10 to 20 percent emergent vegetation; in wintering areas, mallards often loaf on more open water, such as warm-water sloughs, streams, rivers, and flooded fields

## Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative invasive species, such as purple loosestrife, water hyacinth, parrotfeather, hydrilla, and reed canarygrass, begin to reduce habitat quality for mallards

**Delay Crop Harvest:** (in some ecoregions) hay and crop harvest adjacent to wetlands should be conducted after nesting season

**Forest Management:** (in some ecoregions) *Forest Stand Improvement* can favor mast-producing species, especially oaks, in bottomland hardwoods that can be flooded to increase mast production

**Leave Crop Unharvested:** unharvested grains, such as corn, to provide a winter food source; this does not apply

to hay forages or soybeans

**Livestock Management:** livestock should be excluded from nesting areas

**Plant Food Plots:** shallowly flooded grain plots can provide an important food source for migrating and wintering mallards

**Plant Native Grasses and Forbs:** (in some ecoregions) where nesting cover is limiting and planting is necessary to increase coverage of native grasses and forbs

**Repair Spillway/Levee:** if not functioning properly

**Set-back Succession:** *Prescribed Fire* should be used to rejuvenate dense vegetation in nesting areas and to increase or maintain proper water and vegetation interspersion in emergent wetlands that become dry in summer; *Disking* emergent wetlands and fields that will be flooded later will stimulate annual grasses and forbs that are important food plants; *Herbicide Applications* can be used to control unwanted woody species; *Chainsawing* can be used to create openings in bottomland forests that can be flooded

**Soil Conservation Agriculture:** eliminating fall tillage can provide waste grain in the winter

**Water Control Structures:** should be used to control water level in wetlands managed for mallards and other wildlife

**Water Developments for Wildlife:** shallow impoundments can be used to flood grain fields and bottomland hardwoods in winter to provide a valuable food source and loafing areas

**Wildlife or Fish Survey:** aerial surveys are commonly used to estimate trends in the mallard population

## Marbled murrelet

### General information

The marbled murrelet is a small seabird that spends most of its life within a few miles of the coastline in the Pacific Northwest. Marbled murrelets nest in large expanses of old-growth (180 years old or more) coniferous forests. Nests are located on horizontal branches in large coniferous trees up to 50 miles from the coast. The nest is not concealed, but merely positioned in a depression of moss on the limb. Marbled murrelets have low reproductive potential as a female produces only one egg per nesting attempt. The females and the males share incubation duties. Historically, logging old-growth coastal coniferous forests eliminated large tracts of nesting cover for marbled murrelets. As old growth forests have become more fragmented, nest predation is thought to have increased, primarily from ravens and jays. The murrelet also is at risk from coastal oil spills and depletion of forage fish stocks.

### Habitat requirements

**Diet:** small fish, such as anchovies, herring, and smelt, from the ocean within 1-2 miles of the coastline; small crustaceans also are eaten occasionally

**Water:** obtains most water from food

**Cover:** open ocean for most of the year; when threatened, murrelets dive or fly to avoid capture; horizontal limbs on large conifer trees for nesting

### Wildlife management practices

**Conservation Easement:** can protect critical habitat for this declining species

**Control Nonnative Invasive Vegetation:** if nonnative invasive vegetation is reducing habitat quality for marbled murrelet

**Forest Management:** long timber rotations that favor old growth forest should be prescribed; *Forest Stand Improvement*, such as selective thinning that increases growth rates of remaining trees, can be used when a forest stand is not of sufficient age and structure for nesting cover

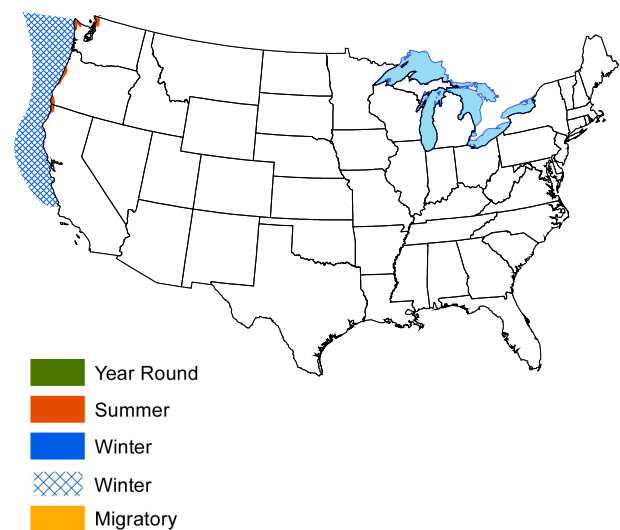
**Plant Trees:** conifers can be planted in areas that are not forested, but have the potential to provide future nesting cover

**Set-back Succession:** *Prescribed Fire* may be used in some situations to consume built-up fuels and reduce chance of wildfire, which could kill trees valuable for nesting

**Wildlife or Fish Survey:** transects conducted via boat parallel to the coastline counting murrelets on the water are useful to determine estimates of abundance.



R. Lowe



## Mountain bluebird

### General information

Mountain bluebirds are found across the western U.S. They use open savannas, pastures, parks, backyards, edges of hayfields and crop fields, and other herbaceous openings with scattered trees, which are used for perching and nesting (where cavities are available). Mountain bluebirds forage in open areas with short vegetation, but typically near trees or a fence that provide perches. Insects dominate the diet during spring and summer, whereas various fruits are most prevalent during fall and winter. Mountain bluebirds nest in cavities, especially old woodpecker cavities, as well as nest boxes. Clutches normally consist of 4-8 eggs.

### Habitat requirements

**Diet:** invertebrates, especially grasshoppers, crickets, beetles, and spiders; various fruits in fall and winter

**Water:** necessary water obtained from diet

**Cover:** nest in cavities of trees and fence posts

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative invasive vegetation begins to compete with native vegetation and reduces habitat quality for mountain bluebirds

**Create Snags:** where cavities are limited to provide potential nest sites and to provide perching sites in open areas (not in forests)

**Edge Feathering:** to increase foraging opportunities, perching sites, and potential cavity trees (if trees are killed and left standing) around fields

**Field Borders:** to increase foraging opportunities around crop fields

**Livestock Management:** livestock must be excluded from recently planted trees and shrubs

**Nesting Structures:** may be placed where a scarcity of natural cavities may be limiting the population; nest boxes should be approximately 5 feet high with an entrance hole 1½ inches in diameter; nest boxes should be placed no closer than 80 yards apart to limit territorial fighting among males

**Plant Native Grasses and Forbs:** to aid in establishing herbaceous groundcover where planting is necessary

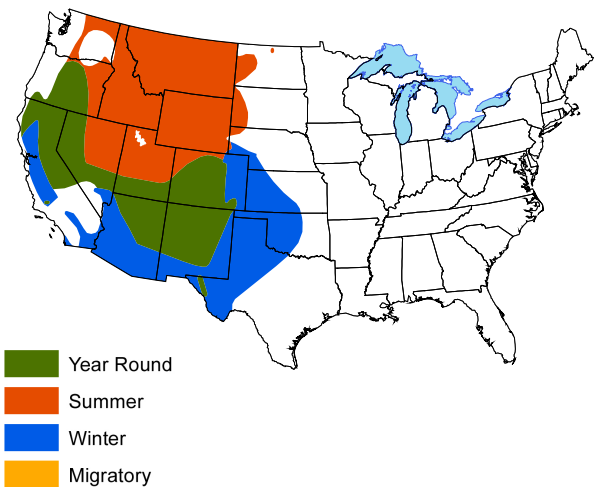
**Plant Shrubs:** in large open areas where perching sites or winter foods may be limiting

**Plant Trees:** in large open areas where perching sites are limiting; may provide potential nest sites in future

**Set-back Succession:** *Prescribed Fire, Disking, Herbicide Applications, Mowing, Chaining, and Drum-chopping* can be used to maintain and rejuvenate grasslands and reduce shrub cover where necessary; *Chainsawing,*



Dave Menke



*Dozer-clearing, and Root-plowing* can be used to convert forested or shrub-dominated areas to savannas and early successional communities; *Mowing* may be used to maintain foraging and loafing cover for mountain bluebirds in **Urban** areas

**Wildlife or Fish Survey:** point counts can be used to monitor bluebird populations; nest boxes should be checked to monitor use and nest success



## Mourning dove

### General information

Mourning doves may be found throughout much of the lower 48 states. They 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 also may be placed on the ground in areas where trees are generally lacking. 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:** freestanding water required daily

**Cover:** shrubs and trees are used for nesting and loafing; areas with open ground space required for foraging

### 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 planted in areas where food is lacking and to facilitate recreational hunting

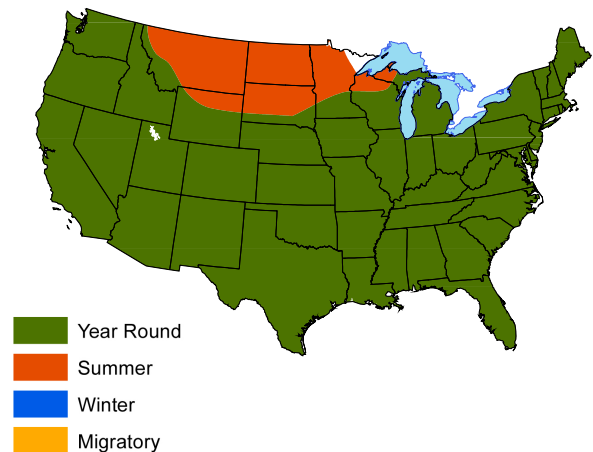
**Plant Native Grasses and Forbs:** where food may be limiting, especially to increase some of the many native forbs that are extremely important sources of seed for mourning dove

**Plant Shrubs:** (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,



Dave Menke



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, Dozer-clearing, and Root-plowing* may be used to remove trees and clear forests and promote early successional plant communities

**Soil Conservation Agriculture:** tillage may be eliminated in the fall to allow 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 freestanding water; this practice also may be recommended when dense vegetation or steep slopes do not allow doves access around the edge of existing water sources.

**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 gamebird 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 and interspersed shrub cover for foraging, nesting, brooding, and loafing. Ideally, bobwhite habitat consists 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 or forb leaves. 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 ragweed, sumpweed, and horseweed, are commonly used for brooding. Northern bobwhite eat a wide variety of seeds, leaves, and insects. Bobwhite chicks primarily eat insects during the first 6-8 weeks of life. Northern bobwhite populations have been declining precipitously for more than 40 years because of habitat loss and degradation.



Heather Inman

### 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, 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; forbs and grasses for nesting; native forbs for brood rearing

### Wildlife management practices

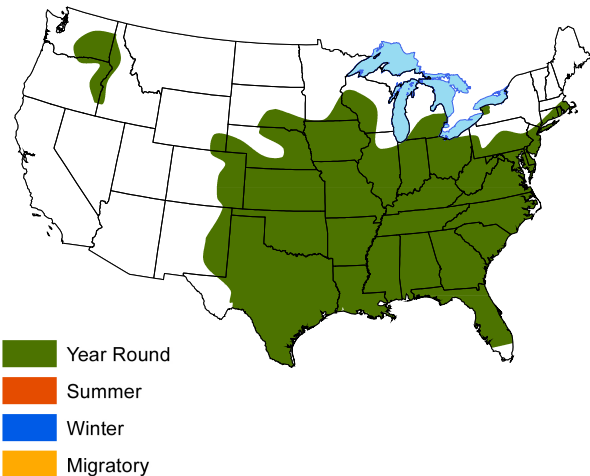
**Conservation Easement:** can protect critical habitat for this declining species in some ecoregions

**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 some ecoregions) in pine forests, *Forest Regeneration*, especially *Clearcut* and *Seed Tree*, will enhance habitat for a few years until regenerating pines close canopy; *Forest Stand*



**Improvement** can be used to reduce tree density to <50% canopy cover in pine stands and mixed pine-hardwood stands to enhance understory conditions; 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 open structure underneath 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 early successional plant communities, shrublands, savanna, and open woodlands (<50% canopy cover); 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 open structure at ground level underneath forb cover; *Chaining* can be used to set-back shrub cover when it becomes too dense and tall; *Chainsawing*, *Dozer-clearing*, and *Root-plowing* may be used to remove trees in any area and/or to convert hardwood forest to early succession or savanna; *Herbicide Applications* may be used to remove undesirable woody encroachment

**Soil Conservation Agriculture:** eliminate fall tillage to provide waste grain

**Decrease Harvest:** may be necessary if populations are declining in areas of good habitat and data suggest mortality from hunting is additive or limiting population growth

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



## Northern flicker

### General information

Northern flickers occupy all of North America, and inhabit most of the U.S. year-round. Flickers are found in forests and woodlands interspersed with herbaceous openings. Northern flickers are often found along riparian zones and urban areas. They prefer older urban residential areas with large trees, golf courses, and parks. Flickers create cavities in trees for nesting; these cavities later become nesting and roosting sites for other species. Thus, flickers are considered an important species for biological diversity. Flickers eat insects, especially ants, as well as soft mast and seeds. Flickers can become problematic in urban areas where they may create holes in wood siding on houses or damage ornamental trees. Wildlife damage management may be necessary. European starlings often take-over flicker cavities for their own nests. Appropriate action should be taken to prevent starlings from occupying nesting cavities of flickers and other cavity-nesting wildlife.

### Habitat requirements

**Diet:** ants are a favorite food and make up about 50 percent of the diet; seeds, soft mast, and earthworms are also eaten; flickers are partial to poison ivy fruit and may use artificial feeders

**Water:** daily water requirements unknown; sufficient water is probably obtained from diet

**Cover:** tree cavities are used for nesting; old, mature trees that show signs of senescence (old age) or decay are often used; softwood trees, such as yellow poplar, cottonwood, and willow, are preferred; flickers will nest in posts, holes in banks, and holes in houses and structures where trees are unavailable

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative species begin to compete with native vegetation and degrade habitat for flickers

**Create Snags:** to enhance possible sites for cavities where snags are limiting, especially softwoods, but other species as well

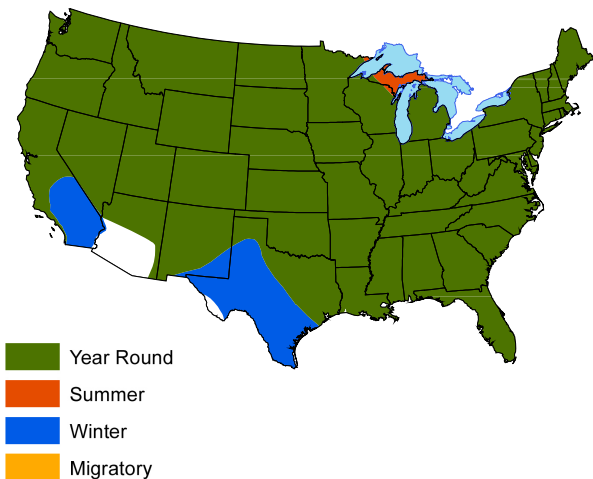
**Forest Management:** *Forest Regeneration* will provide more open area and possibly snags for a short time; *Forest Stand Improvement* can open the structure of the forest and provide snags; snags should be retained during forest management activities

**Plant Shrubs:** several soft mast-bearing shrubs can provide additional food resource when limiting in open areas

**Plant Trees:** in large open areas without trees



Dave Menke



**Set-back Succession:** *Prescribed Fire* will consume the litter layer and facilitate foraging on the ground; *Chainsawing* may be used to reduce overstory tree density to create woodland conditions and improve tree species composition; *Mowing* may be used to maintain foraging and loafing cover for northern flickers in **Urban** areas

**Wildlife Damage Management:** may be necessary to prevent damage from foraging, drumming, and excavating wooden buildings; exclusion practices can prevent access to buildings; harassment can repel flickers from an area

**Wildlife or Fish Survey:** point counts are used to estimate trends in populations

**Artificial Feeders:** may be used to attract flickers in urban areas; suet is preferred

## Northern goshawk

### General information

Northern goshawks are relatively large raptors found throughout the northern, central, and western regions of the U.S. They prefer dense, mature forests where they nest 20 to 80 feet aboveground on a large horizontal limb of a mature tree. Nests are often used for up to five consecutive years. As a raptor, goshawks are fierce predators, commonly eating large birds, squirrels, rabbits, and hares. Goshawks perch while hunting and descend on prey. They will pursue prey for quite a distance when necessary. Goshawks do not prefer to be around human establishments.

### Habitat requirements

**Diet:** mostly small- and medium-sized birds and mammals

**Water:** obtain necessary water from diet

**Cover:** mature forest and woodland; nest in mature trees

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative invasive vegetation begins to compete with native vegetation and reduce habitat quality for northern goshawk and their prey

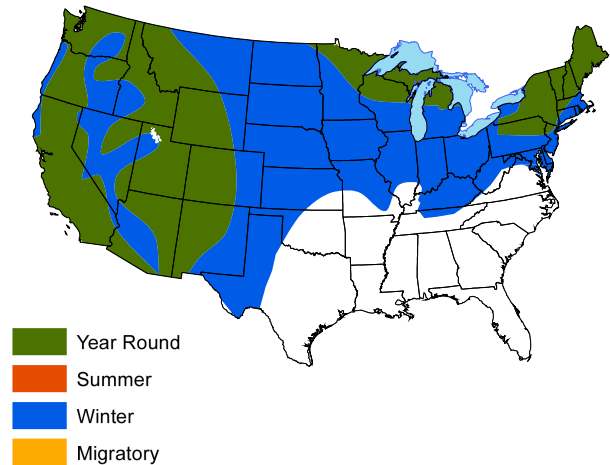
**Forest Management:** *Forest Regeneration (Single-tree Selection)* and *Forest Stand Improvement* can enhance habitat for prey; snags should be retained during forest management

**Plant Trees:** in large open areas to eventually provide habitat for goshawks

**Wildlife or Fish Survey:** observational counts are used to estimate population trends



Karen Laubenstein



## Northern harrier

### General information

Northern harriers are medium-sized hawks that occur throughout North America. They nest throughout Canada and Alaska and much of the western U.S., and winter throughout most of the U.S. Northern harriers are found gliding low over grassland, croplands, and open wetlands searching for prey. They nest on the ground in grasslands and emergent marshes. The nest contains 4-5 eggs and they raise one brood per year. Males are mostly gray, whereas females are mostly brown.

### Habitat requirements

**Diet:** small mammals, especially rodents, but also rabbits, songbirds, and sometimes ducks

**Water:** necessary water obtained from diet

**Cover:** large, undisturbed grasslands and emergent wetlands

### Wildlife management practices

**Control Nonnative Invasive Vegetation:** when nonnative invasive vegetation begins to compete with native vegetation and reduce habitat quality for northern harriers and their prey; sod grasses on upland sites are particularly problematic

**Delay Crop Harvest:** hay harvest should be delayed until midsummer if possible to avoid ground nests

**Leave Crop Unharvested:** to encourage prey availability in fall and winter

**Livestock Management:** grazing should be managed to maintain a diverse vegetation structure conducive to prey and hunting efficiency for northern harrier

**Plant Native Grasses and Forbs:** where native grassland is limiting and planting is necessary

**Set-back Succession:** *Prescribed Fire* should be used to rejuvenate and maintain grasslands and wetlands when conditions permit; *Chaining* and *Drum-chopping* can be used to reduce shrub cover and encourage more herbaceous groundcover; *Chainsawing*, *Dozer-clearing*, and *Root-plowing* can be used to convert forest and extensive shrubland to more open grassland and early successional vegetation; *Herbicide Applications* can be used to reduce shrub and tree cover and encourage more open grassland

**Soil Conservation Agriculture:** delay fall tillage to facilitate hunting prey when waste grain is available

**Wildlife or Fish Survey:** observation counts are used to estimate population trends



Greg Lavaty

