

# ***Wildlife Species***

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This chapter of the WHEP manual contains information on species featured in each of the regions in Alabama. There are three sections: birds, mammals and other species. The species are listed alphabetically in each section.

Each species has specific information on habitat requirements, including diet, water, and cover. Key management practices that are used in some regions are also discussed here.

Management practices for species vary from region to region, and not all the management practices listed for the species will be applicable to all regions. It is important to integrate the information given in the regional charts into the information provided in this section to get a broad picture of the management practices for each species.

This chapter contains all the information you need for the WHEP contest; however, additional reading and research can add depth to your understanding and help you give detail to your plans and oral presentations.

Field guides to North American birds and mammals are good sources for information and pictures of the species listed here. There are also many good websites available for further study.

The information in this section is the basis for the test at the National Invitational. It is critical that participants have the background that mastery of this section will provide. Without knowing specific details of each of the featured species it will be very difficult, if not impossible, to succeed in the other portions of the test.

One way to prepare for the contest is to mark those species that are included in the region you will be judging so the information is more easily found when studying. Some find making note cards very helpful. Collecting pictures of the species from several different sources will help with the identification portion of the test.

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# **Birds**

## **American Kestrel**

### **General Habitat Preference:**

American kestrels are found year-round throughout all of America. Kestrels use stages 2 and 3 of plant succession for feeding, and stages 4, 5, and 6 for roosting and nesting. Kestrels use both natural and artificial cavities for nesting. They eat small mammals, other birds, and insects.

### **Habitat Requirements:**

**Diet:** Primarily insects and small mammals associated with open areas.

**Water:** Kestrels obtain necessary water from diet, and do not need water for drinking.

**Cover:** Kestrels nest in tree cavities and other sites including holes in cliffs, canyon walls, and artificial nesting boxes.

### **Management Practices:**

**Manipulation of Succession:** brush chop, chain, or roller beat small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 4 (shrubs) vegetation; prescribed burning. Grazing management should leave enough herbaceous canopy to support insects and small rodents. Manage livestock grazing to maintain trees in riparian areas.

**Timber Management Techniques:** Clear-cut small areas in large expanses of stage 5 and 6 woodlands.

**Establish Native Grasses and Forbs:** to provide habitat for rodent prey. Maintain areas of stage 5 and 6 vegetation interspersed with stage 2 and 3 vegetation.

**Plant trees and Plant Shrubs (create hedgerows):** in large open areas (irrigate if necessary) on idle lands.

**Nesting Structures:** provide kestrel nesting boxes in areas lacking adequate nesting cavities. Boxes can be placed on fence posts in open areas.

# **American Robin**

### **General Habitat Preference:**

*Robins use a wide assortment of habitats, from open and mowed grassy areas (Stage 2) to forested areas (Stage 6). In urban settings, robins use large open areas and nearby trees and shrubs. Parks, golf courses, and lawns in residential areas are favorite places to inhabit. Robins are found throughout North America, although they may migrate out of northern latitudes during winters with sustained cold and snow. Robins build a nest of grasses and mud on a limb of woody vegetation, but will occasionally nest on building ledges. Robins spend a considerable amount of time on the ground feeding on earthworms, but will also perch on branches to eat berries, fruit, and insects.*

### **Habitat Requirements:**

**Diet:** Insects and worms in warm seasons. Fruits and berries from shrubs and trees in winter. Do not often use artificial feeders.

**Water:** Robins require water daily in warm seasons. They obtain water from yard irrigation, rain-filled gutters, low-lying areas, ponds, etc.

**Cover:** Nesting sites and hiding areas in shrubs, evergreen trees, and broad-leaf trees. Evergreen trees are preferred for early nests. Robins will use nesting platforms.

### **Wildlife Management Practices:**

**Plant Trees and Plant Shrubs (create hedgerows):** that produce fruit and berries in all 4 seasons. Examples include sumac, Nanking cherry, golden currant, and winterberry. Include some evergreen trees in plantings.

**Manipulation of succession:** mow areas to provide short grass and forbs and use insecticides only when necessary.

**Nesting Structures:** provide platforms in areas lacking nest sites.

**Water Developments for Wildlife:** Birdbaths and pans of water can be provided. Do not place water in areas where cats and other pets can catch the birds.

## **Brown Thrasher**

### **General habitat preference:**

Brown thrashers occur in the eastern two thirds of the country. They require stages 3 and 4 of plant succession. Brown thrashers are normally found in shrub thickets, hedgerows, shelterbelts, young forests, forest edges and brushy riparian areas. Brown thrashers forage on or near the ground for food. Their nest is usually found in bushes or small trees 1-10 feet above the ground. They have adapted to suburban gardens and plantings.

### **Habitat requirements:**

**Diet:** Invertebrates and plant seeds are the principal foods, but fruits, berries and nuts are also eaten. Brown thrashers forage primarily on the ground, and use their bills to turn over leaves and debris looking for food. More food is available when there is substantial ground litter. The management practices listed under "Cover" will usually supply sufficient food.

**Water:** Water requirements are not known.

**Cover:** Nesting and hiding cover are supplied by dense shrubs with some trees, stages 3 and 4 of plant succession. Brown thrashers will use areas that have only shrubs. They need a minimum of 2.5 acres of woody vegetation to support a breeding population.

### **Wildlife Management Practices:**

**Manipulation of succession** through mowing, chaining, roller beating and/or controlled burning can be used to maintain and rejuvenate areas of stage 4 vegetation when habitat quality begins to decline. Grazing management should exclude livestock from riparian areas and other woody areas to allow shrubs and trees to regenerate and ground litter to develop.

**Plant trees and Plant shrubs (create hedgerows):** (shelterbelts, field borders and riparian areas) to promote stage 4 and create additional cover for nesting/foraging.

**Timber Management Techniques:** Timber Harvest methods can be implemented to improve vegetation structure for nesting and foraging and stimulate additional stage 4 vegetation within large areas of stage 6 forest where regeneration is needed. Timber Stand Improvement practices in stage 5 and 6 can improve habitat by stimulating understory development.

guzzlers, catchment ponds, windmills and spring

## **Canada Goose (breeding habitat)**

### **General Habitat Preference:**

The breeding range of the Canada goose extends across the northern half of the United States across all of Canada and Alaska. Although an increasing number of Canada geese choose to winter in Canada, especially in urban areas, the majority fly south to southern areas of the United States and even Mexico. Many southern areas of the United States have year-round resident populations of Canada geese. Canada geese nest and rear young in or near stage 2 wetlands interspersed with some stage 3 wetlands. Wetlands containing 20 percent tall emergent aquatic vegetation and 80 percent open water are usually good habitat, as are frequent riparian areas adjacent to rivers.

### **Habitat Requirements:**

**Diet:** During the nesting season and summer, Canada geese prefer new green forbs and grasses. They also eat some aquatic insects and pond weeds.

**Water:** see cover requirements below.

**Cover:** nest in a variety of places such as mats of bulrushes, tops of muskrat houses, in trees, and most of all, on islands. Usually nest within 200 feet of water's edge.

### **Wildlife Management Practices:**

**Manipulation of Succession:** burn or brush chop small areas (40 acres maximum, 10 to 20 acres preferred) every three to five years. Burning produces preferred lush green vegetation.

**Grazing Management:** livestock grazing management is another method to produce the lush green vegetation Canada geese prefer.

**Nesting Structures:** provide artificial nest structures, preferably on islands and/or peninsulas surrounded by open water.

**Establish Native Grasses and Forbs:** provides feeding areas for Canada geese.

**Ponds: Construction:** ponds should be constructed along with stage 2 and 3 wetlands for water needs.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding can be used to provide for stage 2 and 3 wetlands. Water Control Structures should be installed and properly maintained to provide 80 percent open water and 20 percent emergent vegetation.

**Wildlife Damage Management:** In some areas Canada geese have become a problem, causing

damage to lawns, golf courses, and in winter wheat fields.

## **Common Nighthawk**

### **General Habitat Preference:**

Common and Lesser Nighthawks use bare ground (Stage 1) for nesting. Stages 2 and 3 of plant succession interspersed with areas in stages 4 and 5 of plant succession are used for foraging and cover. Common Nighthawks are found throughout the United States during the breeding season, but migrate to South America during the winter. Common Nighthawks are common visitors to grasslands, open woodlands, cities, and towns. In cities and towns they are often seen flying over city parks and other open areas in late evening and early morning. Lesser Nighthawks are found primarily in the southwestern United States (New Mexico, Arizona, and Texas) during breeding and will migrate further south during winter months. Lesser Nighthawks inhabit rivers, ponds, and arid scrub areas. Common Nighthawks nest on the ground on gravel and bare soil areas common in fields or on rooftops. Lesser Nighthawks nest on the ground in desert and arid areas or on canyon ledges. Both species are nocturnal and feed “on-the wing” on flying insects.

### **Habitat Requirements:**

**Diet:** These birds eat flying insects captured on the wing. Flying ants, mosquitoes, moths, and June bugs are examples.

**Water:** Nighthawks do not drink water often. They obtain ample water from their diet, but water sources will attract insects, which provide food for nighthawks.

**Cover:** They do not build nests, but lay their eggs on the ground, often gravelly or sandy, and on flat roofs of buildings. Riparian areas, ridge tops, and other places with numerous sand and gravel areas are favorite nesting locations.

### **Wildlife Management Practices:**

**Manipulation of succession:** use insecticides only when necessary. Carefully follow the directions on the label; mow areas to provide short grasses and forbs; leave areas with no vegetation for nesting.

**Do not disturb nesting sites:** nesting season for the nighthawk, May through June. Stay off roof tops that are used for nesting.

**Plant trees and Plant Shrubs (create hedgerows):** to provide stage 4 and 5 vegetation.

## **Eastern Bluebird**

### **General habitat preference:**

Bluebirds are found in open habitats (stages 2 and 3) interspersed with woods and shrubs (stages 4, 5, and 6), which are used for perching and nesting (where cavities are available). Large open areas without interspersed hedgerows, fencerows, and woodlots may not receive as much use by bluebirds as those areas with more structural diversity.

### **Habitat requirements:**

**Diet:** Bluebirds primarily eat insects and spiders. **Earthworms** and small amounts of fruit may also be eaten. Bluebirds forage in open areas, but typically near trees, shrubs or a fence that provide perches.

**Water:** Bluebirds obtain necessary water from their diet, but may use other water sources when available.

**Cover:** Bluebirds nest in cavities of trees and fence posts. Old woodpecker cavities are especially important. Bluebirds readily nest in nest boxes, which have had a major impact in restoring bluebird populations in some areas.

### **Wildlife Management Practices:**

**Manipulation of succession** through mowing, chaining, roller beating, controlled burning, disking, and chemical application should be used to maintain and rejuvenate areas of stages 2 – 4 when habitat quality begins to decline. Grazing management should prevent livestock from damaging trees and shrubs planted to benefit bluebirds.

**Establish native grasses and forbs** when less than 75 percent of the area is comprised of stages 2 – 4 and where non-native grasses and forbs dominate stages 2 – 3.

**Nesting structures:** should be erected where a scarcity of natural cavities may be limiting the bluebird 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 Trees and Plant Shrubs (create hedgerows):** where needed to provide perches for bluebirds. Hedgerows may be established across open fields larger than 4 acres.

**Retain snags and down woody material:** when harvesting timber or implementing timber stand improvement practices.

**Forest Management Techniques:** Timber Harvest will create foraging habitat for bluebirds 1 – 3 years

after harvest as the stand regenerates. This practice should be recommended in large areas of stage 6 forest where regeneration is needed. Remember, this practice is not intended to create “openings” and some mature trees may provide cavities for bluebirds.

**Use pesticides carefully** in urban areas and implement wildlife damage control measures to reduce/eradicate European starlings and house sparrows as they out-compete and replace bluebirds and other native species for food and cover.

## **European Starling**

### **General Habitat Preference:**

European starlings are found throughout North America. They prefer older suburban and urban residential areas with large trees (Stages 5 and 6) and shrubs (stage 4) interspersed with open areas (stages 2 and 3), but are also abundant in agricultural settings. Starlings are cavity nesters and nest in large trees or old buildings. Starlings are ground feeders and eat a variety of insects, seeds, and fruit.

Starlings were introduced to the United States from Europe and are considered pests, as they are numerous and often out-compete native birds for available habitat. In such situations the management objectives may be to reduce the quality and quantity of available habitat.

### **Habitat Requirements:**

**Diet:** Insects, fruit, seeds, **earthworms**, **grain**, **seeds**, human garbage, even dog and cat food.

**Water:** They require water during warm seasons.

**Cover:** They nest in cavities in trees, old buildings, and old houses.

### **Wildlife Management Practices:**

**Wildlife Damage Management:** Starling populations often grow to levels where they are causing wildlife damage or will cause detrimental conditions for native wildlife by out competing native species for habitat requirements. Therefore, wildlife damage management will most likely be necessary in almost all situations, especially in suburban/urban and agricultural areas. Exclusion practices to prevent starlings from accessing an area are effective. Habitat management to attract starlings should not occur. Remove food, water, and cover available to starlings. Various

harassment practices may be effective. Trap and euthanasia may be appropriate to reduce starling populations.

## **Great Horned Owl**

### **General habitat preference:**

The great horned owl is found throughout North America in a wide variety of habitats, but mainly open stage 6 woodlands, interspersed with areas of stages 2, 3, and 4, including orchards, farm woodlots, and city parks. They are also occasionally found in rocky canyons away from forest cover. The great horned owl is nocturnal and roosts during the day in trees or on sheltered rocky ledges.

### **Habitat requirements:**

**Diet:** Great horned owls forage at night. The diet is extremely varied, but commonly includes small- to medium-sized mammals, including rabbits, skunks, squirrels, and others, as well as reptiles, amphibians, large insects, and fish. Great horned owls rarely consume carrion.

**Water:** These birds obtain necessary water from their diet.

**Cover:** Great horned owls nest in abandoned nests of hawks, crows, or herons, and in large tree cavities, crotches, stumps, caves, and ledges.

### **Wildlife Management Practices:**

**Manipulation of succession** through mowing, chaining, roller beating, controlled burning, disking, chemical application, and grazing should be used to maintain and rejuvenate areas of stages 2 – 4 when habitat quality begins to decline for a number of prey species.

**Establish native grasses and forbs** when less than 25 percent of the area is comprised of stages 2 – 4 and when non-native grasses and forbs dominate stages 2 – 3.

**Plant Trees and Plant Shrubs (create hedgerows):** where less than 25 percent of the area is comprised of stages 4 – 6.

**Retain snags and down woody material:** when regenerating stands with Timber: Harvest and when implementing Timber Stand Improvement practices.

**Timber Management Techniques:** timber harvest should be implemented to regenerate stands in large areas of stage 6 forest and provide additional cover for a variety of prey species. Timber stand improvement will encourage understory development and enhance habitat for a variety of

prey species.

**Wildlife damage management:** may be necessary in some if owls begin to depredate free-ranging poultry.

## **Hairy Woodpecker**

### **General Habitat Preference:**

Stages 4, 5, and 6 of plant succession are best habitat. Hairy woodpeckers will forage in areas of stage 3 of plant succession if areas with mature trees are nearby. They also use wooded urban and riparian areas.

### **Habitat Requirements:**

**Diet:** Hairy woodpeckers feed primarily on insects such as ants, beetle larvae, caterpillars, and adult beetles. The diet is supplemented with fruits and nuts. They forage on a variety of places such as tree trunks, stumps, snags, downed logs, and the ground. Where adequate cover exists, food is usually not a limiting factor.

**Water:** Not limiting, these birds probably obtain necessary water from their diet.

**Cover:** Hairy woodpeckers are cavity nesters; holes are excavated in mature and dying trees and snags for nesting. Management efforts related to cover should focus on maintaining or creating areas with large mature and dying trees, especially in open areas. Within wooded areas, **create or maintain at least one large snag** per acre.

### **Wildlife Management Practices:**

**Plant Trees and Plant Shrubs (create hedgerows):** primarily softwood trees. Establish corridors.

**Manipulation of Succession:** grazing management for livestock should be done in riparian areas to maintain trees. Grazing when woody vegetation is not growing rapidly (fall and winter) usually does less damage to woody vegetation than at other times of the year.

## **House Finch**

### **General Habitat Preference:**

House finches are native to the western United States but are an introduced species in the eastern United States. Their current range is the entire United States. They are found in a wide variety of urban, suburban, and agricultural areas that have trees (stages 5 and 6), shrubs (stage 4), and some open areas (stages 2 and 3). They are also found

in canyons and semi-arid regions in the western part of the country. House finches nest in a variety of raised locations and make a nest from assorted vegetation. Finches eat a variety of seeds, fruits, and buds from both the ground and in trees.

### **Habitat Requirements:**

**Diet:** Soft fruits, buds, and weed seeds. In the warm season house finches eat some insects.

**Water:** They require water daily in warm seasons.

**Cover:** These birds prefer nesting sites on low branches of trees, on branches of bushes, in natural cavities, in old holes excavated by woodpeckers, and any projection or ledge they can find on houses and buildings. They prefer to place the nest from five to seven feet above the ground. The nest is built of weed stems, small branches, and leaves.

### **Wildlife Management Practices:**

**Artificial feeders:** They use artificial feeders of all types. Millet and sunflower seeds are favorites.

**Do not disturb nesting sites:** found on houses and buildings unless they are causing a problem such as plugging a rain gutter.

**Establish Native Grasses and Forbs** to provide grass and forb seeds for finches.

**Mowing:** areas to provide vegetation in stages 2 and 3

**Plant Trees and Plant Shrubs (create hedgerows):** Plant shrubs adjacent to open areas for nesting and hiding cover.

**Use Pesticides Carefully:** Pesticides should be used carefully because insects are an important part of finch diets during nesting season.

**Water developments for wildlife:** Birdbaths and pans of water can be provided, or a low area in the yard can be filled with water. Try not to place water in areas where cats and other pets can catch the birds.

## **House Sparrow**

### **General Habitat Preference:**

House sparrows' range encompasses the entire United States. They are an introduced species from England (thus their other name of English sparrow) and are found in a wide variety of urban habitats that have buildings, trees (stages 5 and 6), shrubs (stage 4) and some open areas (stages 2 and 3). House sparrows are also very common in and around agricultural buildings. 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 above the ground in woody vegetation for seeds, insects, and fruit.

They compete with native house finches and other birds for habitat requirements. They can become a nuisance, and management objectives may be to reduce the quality and quantity of available habitat. In the inner city, management for wildlife may be limited to this species and a few others. Wildlife damage management may be needed in some areas.

### **Habitat Requirements:**

**Diet:** House sparrows eat a variety of insects, fruits, buds, **forbs**, weed seeds, and waste grain.

**Water:** House sparrows require water daily in warm seasons.

**Cover:** They nest on low branches of trees, on bushes, in natural cavities, in old holes excavated by woodpeckers, and on any projection or ledge they can find on buildings or other structures. They prefer to place nest from five to seven feet above the ground. Nests are built of weed stems, small branches, and leaves.

### **Wildlife Management Practices:**

**Wildlife Damage Management:** House sparrow populations often grow to levels where they are causing wildlife damage or will cause detrimental conditions for native wildlife by out competing native species for habitat requirements. Therefore, wildlife damage management will most likely be necessary in almost all situations, especially in suburban/urban and agricultural areas. Exclusion practices to prevent house sparrows from accessing an area are effective. Habitat management to attract house sparrows should not occur. Remove food, water, and cover available to house sparrows. Various harassment practices may be effective. Trap and euthanasia may be appropriate to reduce house sparrow populations.

## **House Wren**

### **General Habitat Preference:**

House wrens are found throughout the United States during the breeding season, and migrate to the deep southern United States during winter months. In urban settings, house wrens prefer older residential areas with large shrubs (stage 4) and trees (stages 5 and 6). Wrens also use

forested (stages 5 and 6) and open areas (stages 2 and 3) at higher elevations, as well as stands of aspen (Stages 5 and 6). House wrens nest in a variety of elevated cavities as high as 30 feet above the ground. Wrens primarily eat insects and forage on the ground as well as above the ground.

### **Habitat Requirements:**

**Diet:** Spiders, grasshoppers, crickets, beetles, caterpillars, ants, bees, ticks, **earthworms**, and millipedes. Artificial feeders are usually not used.

**Water:** These birds obtain necessary water from their diet. They do not need to drink water.

**Cover:** House wrens nest in natural cavities in trees, old buildings and other structures. They will use artificial nest boxes.

### **Wildlife Management Practices:**

**Plant Trees and Plant Shrubs (create hedgerows).**

**Use pesticides carefully:** Use insecticides only when necessary. Carefully follow instructions on the label.

**Nesting structures:** Provide nest boxes 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 small to keep out house sparrows, starlings, and other birds. For specifics on nest box design and placement, visit your local Cooperative Extension office.

**Do not disturb nesting sites** found on houses and buildings unless they are causing a problem.

## **Hummingbird**

### **General Habitat Preference:**

There are 18 species of hummingbirds found in North America. Other than a couple of exceptions, hummingbirds migrate into Central and South America during the winter months. Hummingbirds are found in or near mixed woodlands and forests rich in flowering plants. They prefer stages 5 and 6 of plant succession mixed with areas in stages 2, 3, and 4. In urban settings, they prefer areas with large trees and nearby flowering plants. A hummingbird's nest is a small cup built of lichens and other vegetation and suspended from a forked branch. Hummingbirds feed primarily on nectar, but will also eat small insects.

### **Habitat Requirements:**

**Diet:** Nectar from flowers and insects found on flowers. Hummingbirds require high energy foods. Nectar is high in sugars that supply needed energy.

Insects are an important source of protein.

**Water:** Hummingbirds obtain necessary water from diet. They do not need to drink water.

**Cover:** Hummingbirds construct small nests on tree branches, usually 5 to 20 feet above the ground. Occasionally they build nests in secluded areas on houses and buildings. The nest is made out of leafy materials and spider silk.

### **Wildlife Management Practices:**

**Plant flowers:** Hummingbirds seem to be attracted to the color red. Some preferred flowers are petunias, gladiolus, nasturtiums, begonias, morning glory, evening primrose, columbine, and cardinal flower.

**Plant Trees and Plant Shrubs (create hedgerows):** Plant flowering shrubs, vines, and trees. Favorites are hibiscus, trumpet vine, lilac, flowering dogwood, and various fruit trees. Trees with rough bark are preferred.

**Artificial feeders:** Hummingbirds use artificial feeders filled with sugar-water (1 part sugar to 4 parts boiled water). Place multiple feeders in an area to diminish territoriality between hummingbirds. Keep feeders clean. Never give honey-water to hummingbirds. Honey ferments faster than sugar and quickly develops a mold that kills hummingbirds. For specifics on artificial feeder design and placement visit your local Cooperative Extension office.

**Use pesticides carefully:** Use insecticides only when necessary. Carefully follow instructions on the label.

**Do not disturb nesting sites** found on houses and buildings unless they are causing a problem such as plugging a rain gutter.

## **Lark Bunting**

### **General Habitat Preference:**

This species prefers short grass prairies during the breeding season, although it is also found in mixed grass prairies. It migrates into the southern Great Plains and Mexico during winter where it is found in grasslands, deserts, shrublands, and cultivated fields. Successional stages 2-4 are primarily used by this species.

### **Habitat Requirements:**

**Diet:** Insects are an important component of the diet of this bird when available. Seeds, some fruit, and grain are consumed as well, especially during the winter.

**Water:** This species obtains necessary water from food.

**Cover:** Adequate grass cover is necessary for the species, particularly during the nesting season. This species nest on the ground primarily in native prairie.

### **Wildlife Management Practices:**

**Manipulation of Succession** (ideally with prescribed fire) is an important component of maintaining native prairie habitat for this and many other grassland birds. This ensures both adequate cover and food resources. Grazing management for livestock should be implemented so that adequate nesting habitat exists for this species.

**Establishment of Native Grasses and Forbs** may be necessary where large prairie conversions have taken place.

**Harvest Timing of Crops** of hay until after nesting is complete is beneficial.

## **Mallard (breeding habitat)**

### **General Habitat Preference:**

The Mallard has one of the most extensive breeding ranges of any duck in North America, extending across the northern one-third of the USA, and up to the Bering Sea. As migratory waterfowl, they winter south of Canada, throughout the United States south to Central America. Mallards are dabbling ducks that nest in tall forb and grass vegetation or in shrubby cover. They need open water (stage 2 of wetland succession) with associated emergent aquatic vegetation (stage 3) to raise young.

### **Habitat Requirements:**

**Diet:** Aquatic plants and insects are common foods. Ducklings eat mostly aquatic insects. Most food is associated with wetlands.

**Water:** see cover requirements below.

**Cover:** Mallards nest in grass and forb vegetation (sometimes they nest under shrubs) preferably within ½ mile of a wetland that provides open water with some adjacent emergent aquatic vegetation. After ducklings hatch they use open water and adjacent emergent aquatic vegetation for protection from predators. Ideally, wetlands will have a minimum of 50 percent open water and 10 to 20 percent emergent vegetation.

### **Wildlife Management Practices:**

**Manipulation of Succession:** use prescribed

burns, brush chopping, or livestock grazing management to rejuvenate dense stagnant vegetation in nesting areas. Burn or chop every three to five years in spring before nesting begins. These practices can be used to increase or maintain proper water and vegetation interspersion in wetlands. Livestock grazing should be managed to provide areas with tall, healthy, herbaceous vegetation that are not disturbed during the nesting season.

**Harvest Timing:** harvesting of hay and crops adjacent to wetlands should be done after nesting season.

**Nesting Structures:** used occasionally to provide additional nesting areas.

**Establish Native Grasses and Forbs:** grasses and forbs (legumes) should be established within ½ mile of wetlands that meet the criteria described under cover.

**Ponds: Construction:** used in areas without wetlands. Ponds and reservoirs should be built with gently sloping banks.

**Riparian Buffers:** establish where cover is limited.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding: provide temporary open water areas mixed with aquatic emergent vegetation. Water Control Structures: provide some shallow water areas (less than two feet deep) adjacent to deep water where emergent and submergent vegetation can grow.

## **Mallard (Winter Habitat)**

In some areas, large flocks of mallards can be a nuisance; therefore wildlife damage management may be necessary.

### **General Habitat Preference:**

Mallards prefer to spend the winter in wetlands that contain all 4 Wetland stages including Stage 1 (open water) and Stage 4 (harvested grain crops). In addition, riparian areas with open water may be used. Mallards are an example of a dabbling duck. These birds feed at or near the surface of the water by filtering food items such as invertebrates, seeds and other plant materials from the water. Dabbling ducks are often seen tipping upside down in the water to reach food at the bottom of a pond. Unlike diving ducks, they feed in much shallower water and will not dive under to obtain food.

### **Habitat Requirements:**

**Diet:** Mallards feed on a variety of plant and animal matter; preferred foods include waste grain from agriculture, aquatic plants, and invertebrates. Mallards will fly long distances to feed; however, the closer the food is to protective cover the more valuable and useful it becomes.

**Water:** Mallards use water as described above.

**Cover:** Mallards rest on open water bodies such as streams, rivers, and warm-water sloughs that are not frequently disturbed. They also rest on the ice in the middle of lakes.

### **Wildlife Management Practices:**

**Tillage Management:** eliminate fall tillage so as to provide waste grain in the winter.

**Grain:** leave unharvested.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding of grain fields, planted food plots, and oak woodlands in winter.

**Plant food plots:** In the Hot Desert Region, planting food plots is beneficial if adequate moisture is available.

**Ponds: Construction:** reservoirs, and warm-water sloughs.

**Water Developments for Wildlife:** dugouts and catchment ponds constructed for livestock drinking are also used for resting.

**Manipulation of Succession:** grazing management: livestock should be managed so that some cover is retained in shallow areas.

**Keep human disturbance to a minimum.**

## **Mourning Dove**

### **General Habitat Preference:**

Mourning doves may be found over much of the lower 48 states. They prefer stages 2 and 3 of plant succession for feeding with some shrubs and trees nearby for roosting.

### **Habitat Requirements:**

**Diet:** Mourning doves often use agriculture areas for feeding and a variety of grass and forb seeds. They will forage on waste grain from cropland and livestock feed lots. In addition, small areas of bare ground are also beneficial for the birds to obtain grit (small gravel) to help in digesting food.

**Water:** Mourning doves require water daily. They prefer shorelines and banks without vegetation.

**Cover:** Mourning doves prefer tall shrubs and trees for nesting and loafing. Nests are made of twigs placed on branches of shrubs or trees. Nests are also placed on the ground.

## **Wildlife Management Practices:**

**Establish Native Grasses and Forbs** to provide forb seeds for food.

**Grain:** leave unharvested for a variety of small grain crops such as wheat, barley, millet, milo, or oats.

**Harvest Timing of Crops:** Delay harvest of crops in the spring to avoid nest destruction

**Manipulation of Succession:** Disk areas to provide bare ground; Brush Chop, Chain/Roller Beat small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 4 vegetation; prescribed burning of small areas (40 acres maximum, 10 to 20 acres preferred) in large areas of stage 4 and 5 of plant succession.

Livestock grazing management can be used to keep some areas in stage 2 and 3 vegetation.

**Plant Trees and Plant Shrubs (create hedgerows):** in large areas of stage 2 and 3 of plant succession or in agricultural areas having few trees or shrubs. Plant on field borders, along fence rows, or on any other idle land area.

**Plant Food Plots:** in areas lacking grain.

**Retain/Create Snags and Down Dead Woody Material** to create perching sites.

**Tillage Management:** Tillage of cropland may be delayed in spring to allow the use of standing stubble for nesting. Tillage may be eliminated in the fall to allow wildlife access to waste grain.

**Water Developments for Wildlife:** where water is limited or absent, development of water sources is desirable. Some examples are: catchment ponds, guzzlers, windmills

## **Northern Bobwhite**

### **General Habitat Preference:**

Stages 2, 3, and 4 of plant succession interspersed. Ideally, habitat components are made up of scattered patches of shrubby cover with diverse native stands of grass and forbs. Bunch grasses such as bluestems are used for nesting cover, while more recently disturbed sites that are rich in forbs and insects are used for brood rearing. In some parts of the country savannah habitat provides excellent habitat. This savannah forest (stage 5 or 6) should consist of very few trees with an understory of grass and forbs maintained by frequent fire (2-4 years). This savannah may be pine (as in the Southeast Mixed and Outer Coastal Plain Forest), or oak (as in the Cross Timbers portion of the Great Plains). Some agricultural crops can provide seasonal food for bobwhite quail,

but they are no substitute for diverse native plant communities.

### **Habitat Requirements:**

**Diet:** Young quail eat insects. Adult quail eat a variety of seeds, green vegetation (mostly forbs), insects, and small grains.

**Water:** Bobwhites do not require free-standing water. They obtain all water from native vegetation.

**Cover:** Thick shrubs for hiding and roosting cover; dense perennial grasses for nesting.

### **Wildlife Management Practices:**

**Establish native grasses and forbs** if they are absent. Often, the use of fire will release native seeds so that reseeding is not necessary.

**Grain:** leave unharvested - Leave some grain unharvested in agricultural areas.

**Harvest Timing of Crops:** Time haying to protect nesting areas in May and June.

**Manipulation of succession:** Prescribe burn small areas (40 acres or less) in large expanses of stage 3 and 4 vegetation. Annual burning in stage 5 and 6 woodlands is also beneficial to create savannah habitat. Prescribed burning is the most important tool for quail management and should be used if possible; disk small areas in large expanses of stage 3 and 4 to encourage annual forbs and grasses used by bobwhite. Disking should be avoided in native rangelands. Fire will encourage similar plant communities without soil disturbance and at a lower cost; brush chop, chain, root plow, or roller beat small areas (40 acres or less) in large expanses of stage 4 vegetation. Grazing management: Keep livestock from grazing planted food plots. Ample amounts of herbaceous vegetation used for food by quail should be left in appropriate areas. This is especially important in riparian areas. Livestock grazing also can be used to revert or maintain vegetative succession in stages 2 and 3 vegetation. Livestock management should be used to encourage a uniform structure of plants across the landscape so that all the seasonal needs of quail are met. Uniform clipping of vegetation by cattle across large areas leaves no nesting cover and does not encourage annual forb production. Cattle grazing in combination with prescribed burning is an excellent quail management strategy that mimics historic natural disturbance events. Manage livestock grazing to maintain dense shrub and herbaceous cover in some areas. However, up to 1/3 of an area can be grazed more intensively to encourage annual forb production for brood habitat assuming that the same areas are not repeatedly grazed the same

way. In other words, grazing pressure should be rotated over time.

**Plant food plots:** Plant 1/8 to 1/4 acre perennial food plots in areas with too little permanent food and cover, again, one plot per 15 acres maximum.

**Plant Trees and Plant Shrubs (create hedgerows):** in areas where cover is scarce. If shrub patches are within 30-75 m of each other, additional shrub cover is not needed.

**Tillage Management:** Eliminate fall tillage.

**Timber Management Techniques:** timber harvest - Clear-cut small areas (small 40 acre patches or strips) in large expanses of stage 5 and 6 woodland; selective-cut stage 6 woodlands.

## **Northern Flicker**

### **General Habitat Preference:**

Northern flickers occupy all of North America, and inhabit most of the United States year-round. Flickers use open areas in stages 2 and 3 of plant succession interspersed with areas of stages 5 and 6 of plant succession. Northern flickers are often found in riparian and urban areas. They prefer older urban residential areas with large trees, golf courses, and parks. Flickers create cavities in trees for nesting and will occasionally use nest boxes. Flickers eat insects, especially ants, as well as fruit berries, and seeds.

Flickers can become problems in urban areas where they may create holes in wood siding on houses or damage ornamental trees. Wildlife damage management may be necessary.

### **Habitat Requirements:**

**Diet:** Ants are a favorite food source and make up about 50 percent of their diet. They also eat seeds, fruits, **earthworms**, and berries and are partial to the fruit of poison ivy. Flickers usually feed in open areas and will utilize artificial feeders.

**Water:** Not much is known about daily water requirements. They probably obtain sufficient water from diet.

**Cover:** Holes are excavated in trees for nesting. They use softwood trees like poplar, cottonwood, and willow and prefer old mature trees that show signs of dying or rotting. In treeless areas, they will nest in posts, holes in banks, and holes in houses and structures.

### **Wildlife Management Practices:**

**Timber Management Techniques:** timber harvest - Clear-cut small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 5

and 6 forests. Selective-cut timber management in stages 5 and 6 of plant succession.

**Manipulation of succession:** Mow herbaceous vegetation to keep relatively short in height for foraging. Grazing management: Manage livestock grazing, so that herbaceous vegetation is kept at medium to short heights.

**Artificial feeders:** are used in urban areas. They prefer suet feeders fastened to tree trunks.

**Use pesticides carefully:** and with caution in urban areas.

**Retain snags and down wood material:** Maintain some large mature and standing dead trees (snags) when harvesting timber.

**Plant Trees and Plant Shrubs (create hedgerows):** In large expanses without trees, plant softwood trees. **Wildlife Damage Management** may be necessary to prevent damage from flickers foraging, drumming, and excavating wood-built buildings. Exclusion practices to prevent flickers access to buildings may be effective. Harassment may be effective to repel flickers from an area. Habitat management may be effective by providing flickers alternative food sources (suet) or nesting cover (nest box) to draw flickers away from buildings.

Special: European starlings often take over flicker cavities for their own nests. Be vigilant and take appropriate action to prevent starlings from occupying nesting cavities of flickers or other cavity-nesting wildlife.

## **Ovenbird**

### **General habitat preference:**

Ovenbirds frequent mature deciduous and mixed forests throughout the eastern third of the U.S.

### **Habitat requirements:**

**Diet:** Ovenbirds eat primarily insects (ants, caterpillars, and beetles), slugs, snails, and earthworms. Seeds and fruits are also occasionally eaten.

**Water:** Ovenbirds usually obtain necessary water from their diet, but will also use other water sources when available.

**Cover:** Ovenbirds are ground-nesting birds. They construct a nest of grasses and forbs that is arched over in the shape of a Dutch oven, hence the name. The nest is usually well hidden in herbaceous vegetation on the forest floor. An herbaceous understory is also important for cover as ovenbirds forage along the forest floor.

## **Wildlife Management Practices:**

**Manipulation of Succession:** livestock grazing management is critical to avoid grazing in stage 6 forest.

**Plant Trees and Plant Shrubs (create hedgerows):** in areas where less than 75 percent of the area is in stages 5 or 6 forest.

**Timber Management Techniques:** timber stand improvement will encourage increased groundcover important for nesting and foraging cover.

## **Red-eyed Vireo**

### **General Habitat Preference**

Associated with stages 5 and 6 of plant succession. The red-eyed vireo inhabits open deciduous and mixed forests with dense understory of saplings, in wooded clearings, or borders of burns. It is found in both upland and river bottom forests and sometimes in residential areas where abundant shade trees provide a continuous canopy. It is seldom found where conifers make up 75 percent or more of the basal area.

### **Habitat Requirements:**

**Diet:** Mainly insects gleaned from leaf surfaces in mid to upper tree canopies. The red-eyed vireo also eats spiders, a few snails, wild fruits, and berries.

**Water:** They obtain necessary water from diet.

**Cover:** These birds nest in deciduous or coniferous trees or shrubs. They suspend deep cup nests from a horizontal fork of a slender branch, usually in dense foliage five to ten feet above the ground, but sometimes as high as 60 feet.

### **Wildlife Management Practices:**

**Timber Management Techniques:** Timber Harvest: Selective-cut forest management in large expanses of stage 6 woodland can increase the amount of insects.

**Manipulation of Succession:** grazing management: Livestock grazing has little or no effect on this species.

**Plant Trees and Plant Shrubs (create hedgerows):** in large areas of stages 3 and 4 of plant succession.

## **Redhead**

### **General Habitat Preference:**

The redhead ranges over the north-western and central United States and Mexico. They winter in southern areas of the United States into Mexico. They are diving ducks that use stage 2 wetlands for most activities. They usually nest in emergent aquatic vegetation associated with stage 3 wetlands that are adjacent to stage 2 wetlands.

### **Habitat Requirements:**

**Diet:** Young redhead ducks eat primarily aquatic invertebrates (mollusks, snails, crustaceans) during late spring and early summer. During the rest of the year they prefer aquatic plants such as pond weeds, muskgrass, bulrush seeds, wild celery, water lily seeds, and coontail.

**Water:** see cover requirements below.

**Cover:** Nests are built out of emergent vegetation and usually placed above water or very near the shore in dense vegetation that provides concealment. Water levels should be controlled in order to promote growth of tall emergent aquatic vegetation. Strive for wetlands comprised of 50 percent stage 3 interspersed with 50 percent stage 2 wetland.

### **Wildlife Management Practices:**

**Manipulation of Succession:** use prescribed burns every three to five years along with brush chopping or mowing to rejuvenate deteriorated vegetation. Livestock grazing management: use to maintain tall emergent aquatic vegetation adjacent to the water. Prolonged protection of nesting areas from disturbances such as grazing and fire can result in deterioration of the vegetation. Intense grazing of such areas every three to five years (after nesting season) often rejuvenates the vegetation. Usually only 1/3 to 1/2 of the nesting area should be treated during any one year.

**Ponds: construction:** build ponds / wetlands with a minimum size of one surface acre of water, and manage water levels to provide habitat as described under water control structures below.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding: construct small dikes to temporarily flood areas dominated by tall emergent aquatic vegetation during the nesting season. Water Control Structures: since redheads are diving ducks, control water levels to promote growth of tall emergent aquatic vegetation (stage 3 wetland) adjacent to stage 2 wetlands with an abundance of floating and submerged aquatic vegetation (water depth three to five feet).

## **Red-Winged Blackbird** **(breeding habitat)**

### **General Habitat Preference:**

Red-winged blackbirds breed across the United States and throughout central Canada. They winter across the United States and extreme southern Canada. They prefer stage 3 wetlands dominated by emergent aquatic vegetation.

### **Habitat Requirements:**

**Diet:** Red-winged blackbirds use waste grain and seeds of annual forbs in fall, winter, and early spring. They eat a variety of insects in the summer. Many of the insects used for food are associated with tall emergent aquatic vegetation such as cattails, bulrushes, marsh grass, and a variety of shrubs and trees.

**Water:** Red-winged blackbirds frequent areas associated with water.

**Cover:** These birds nest close to the ground or water in dense clumps of emergent aquatic or other herbaceous vegetation. They often roost (rest) in the same areas or in nearby trees and shrubs.

### **Wildlife Management Practices:**

**Manipulation of Succession:** use prescribed burns and brush chopping every three to five years to rejuvenate old, decadent, emergent aquatic vegetation. **Livestock grazing management:** use adjacent to and/or in wetlands to maintain cattails, shrubs, and trees.

**Plant Trees and Plant Shrubs (create hedgerows):** plant adjacent to wetlands or ponds but not on the dam or dike.

**Ponds: construction:** construct ponds and wetlands with shallow water (less than 2 feet deep) where tall emergent aquatic vegetation can grow.

**Riparian Buffers:** used for roosting habitat and also protects the water quality of streams and wetlands.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding: use for providing shallow water where emergent vegetation can grow. Water Control Structures: use for maintaining shallow water areas where emergent vegetation can grow.

**Wildlife Damage Management:** This species is often a pest in agricultural areas where they may damage crops. In such situations, management objectives may be to reduce the quality and

quantity of habitat. It is often more appropriate to manage for this species in urban wetlands and other areas where crop damage is not common.

## **Rock Dove (Pigeon)**

### **General Habitat Preference:**

Rock doves are an introduced species and are found year-round throughout urban and agricultural areas in the United States. They particularly like large buildings, parks and open areas. Rock doves create a shallow nest of sticks, leaves, and other vegetation and nest above the ground and on or around buildings. Rock doves primarily feed on the ground on small grains, seeds, crumbs, and garbage.

In some areas rock doves are considered pests. In such situations the management objectives may be to reduce the quality and quantity of available habitat or reduce damage.

### **Habitat Requirements:**

**Diet:** Rock doves forage on the ground. They prefer waste grain and weed seeds. In urban areas they live mostly on human handouts.

**Water:** They require water frequently in warm seasons. They usually can fly far enough to find water.

**Cover:** They nest on window ledges, roof tops, bridges, and a variety of structures.

### **Wildlife Management Practices:**

**Wildlife Damage Management:** Rock dove populations often grow to levels where they are causing wildlife damage or will cause detrimental conditions for native wildlife by out competing native species for habitat requirements. Therefore, wildlife damage management will most likely be necessary in almost all situations, especially in suburban/urban and agricultural areas. Exclusion practices to prevent rock doves from accessing an area are effective. Habitat management to attract rock doves should not occur. Remove food, water, and cover available to rock doves. Various harassment practices may be effective. Trap and euthanasia may be appropriate to reduce rock dove populations.

## **Ruffed Grouse**

### **General habitat preference:**

The ruffed grouse occurs in stage 4, 5, and 6 cover

across the more northern latitudes of North America and down the Appalachian range. Ruffed grouse are found in a variety of deciduous forest types, but are particularly closely associated with aspen, especially young stands with relatively dense structure.

### **Habitat requirements:**

**Diet:** Primary foods of ruffed grouse vary with location. Primary foods include buds, acorns, beechnuts, soft mast, insects and other invertebrates, and leaves of forbs.

**Water:** Ruffed grouse obtain the water they need from the foods they eat.

**Cover:** Ruffed grouse nest in a variety of forest types and age classes. Ruffed grouse prefer 6- to 20-year-old stands (stage 5), but readily use mature stands (stage 6, especially with a dense midstory) in close proximity for foraging.

### **Wildlife Management Practices:**

**Manipulation of succession** through prescribed burning can be used to maintain and rejuvenate areas of stage 4 and improve brooding cover in stages 5 and 6. Livestock grazing management is critical to avoid grazing in stages 5 and 6 and protect trees and shrubs planted for grouse.

**Plant trees:** where stages 5 and 6 represent less than 50 percent of the area considered and where stages 5 and 6 forest contain few or no mast-producing trees.

**Plant Trees and Plant Shrubs (create hedgerows):** where additional soft mast is needed and to develop thickets and hedgerows in fields and other areas where stage 4 and 5 cover is lacking.

**Retain snags and down woody material** to provide adequate drumming sites.

**Timber Management Manipulation:** timber harvest methods within stage 6 forest will stimulate regeneration that will provide optimum cover for grouse within 6 years. Timber stand improvement practices can be used to stimulate desirable structure and stem density within stages 5 and 6 forest and enable crowns of desirable trees to grow and produce additional mast.

## **Song Sparrow**

### **General Habitat Preference:**

Song sparrows inhabit all of America, but will

migrate from the extreme northern areas during colder months of the year. Song sparrows occupy edge areas where stage 2 and 3 vegetation is present with nearby shrubs (stage 4) and small areas of stages 5 and 6. Often nest along forest edges in a cup nest of grass and leaves on or near the ground. Song sparrows primarily feed on the ground and eat seeds, insects, and *fruit*.

### **Habitat Requirements:**

**Diet:** Weed seeds and insects of all kinds are used as a food source, as are fruit when available.

Artificial feeders placed on the ground can be used.

**Water:** Frequent water in warm seasons is required.

**Cover:** Thick shrubs for nesting and hiding. The nest is often placed on the ground under a shrub or in thick herbaceous cover and made of grass, leaves, and weeds.

### **Wildlife Management Practices:**

**Artificial feeders:** Millet and sunflower seeds are favorites.

**Do not disturb nesting sites.**

**Establish native grasses and forbs** for cover and nesting

**Harvest Timing of Crops:** should be delayed to prevent nest destruction

**Plant Shrubs (create hedgerows):** that provide fruit in all 4 seasons

**Use pesticides carefully:** Use insecticides only when necessary. When using insecticides, carefully follow the directions on the label.

**Water development for wildlife:** Birdbaths and pans of water can be provided. Remember, try to place water in areas where cats and other pets can't catch the birds.

## **Wild Turkey**

### **General habitat preference:**

Wild turkeys are found in a wide variety of forest types across the U.S. They are limited only by tree cover for roosting. Optimum habitat composition may be one third to one half in stage 6 forest containing an abundance of hard- and soft-mast producers, well interspersed with stages 2, 3, and 4.

### **Habitat requirements:**

**Diet:** Wild turkeys eat a wide variety of acorns, nuts, miscellaneous seeds, insects and other

invertebrates, soft mast, and waste grain (especially corn and wheat).

**Water:** Wild turkeys obtain water from their diet, but will use free-standing water when available.

**Cover:** Wild turkeys nest in mature forest, regenerating forest, brushy thickets, and old-fields with rank cover. The nest is a shallow depression on the ground lined with leaves and/or grass. It is usually well concealed amongst vegetation or against some object (e.g., a tree, log or brush). Wild turkeys roost in trees or tall shrubs (if no trees are present) at night.

## **Wildlife Management Practices:**

**Decrease / Increase Harvest:** Harvest levels may need to be adjusted depending on population status and management objectives.

**Manipulation of succession** through mowing, chaining, roller beating, controlled burning, disking, chemical application, and grazing should be used to maintain and rejuvenate areas of stages 2 – 4 when habitat quality begins to decline. Livestock grazing management should prevent livestock from degrading habitat by overgrazing and damaging trees and shrubs planted to benefit wild turkeys.

**Establish native grasses and forbs:** where less than one quarter of the area is comprised of stages 2 and 3 and where non-native grasses and forbs dominate stages 2 and 3.

**Grain: Leave Unharvested** (especially corn): so wild turkeys can glean waste grain from the field. This is especially important during years of poor mast production.

**Plant food plots** where grain crops and quality forages (such as clovers) are lacking to provide a supplemental food source and additional areas for brood rearing.

**Plant Trees and Plant Shrubs (create hedgerows):** where additional soft mast is needed and to develop hedgerows across fields greater than 4 acres. Plant mast trees where stages 5 and 6 represent less than one third of the area considered and where stages 5 and 6 contain few or no mast-producing trees.

**Tillage Management:** Eliminate in the fall to provide additional waste grain, especially adjacent to stages 5 and 6 cover.

**Forest Management Techniques:** timber harvest methods in large areas of stage 6 can enhance nesting habitat, provide additional brood cover, soft mast, and miscellaneous seed for 2 – 3 years after harvest. Timber stand improvement practices can be used to improve the structure of the understory

for nesting and brood rearing, increase production of soft mast and miscellaneous seed, and enable the crowns of desired trees to grow and produce additional mast.

**Water developments for wildlife:** can be useful when there is little or no free-standing water on the property.

**Wildlife damage management:** may be necessary in rare instances when wild turkeys

## **Wood Duck**

### **General habitat preference:**

Wood ducks are primarily found along rivers and large creeks within bottomland hardwoods forests, stage 3 wetlands and swamps with emergent woody vegetation adjacent to stage 2 wetlands, and shallowly flooded stage 5 and 6 hardwood forest.

### **Habitat requirements:**

**Diet:** Acorns are the primary diet item of wood ducks in fall and winter. They also eat other nuts, various miscellaneous seeds and fruits, as well as waste grain (especially corn), all depending upon availability. Insects and other invertebrates are most important for wood duck chicks and hens prior to and during the nesting season.

**Water:** Wood ducks spend most of their lives in water, drink regularly, and obtain water through their diet.

**Cover:** Wood ducks nest in tree cavities in stage 6 hardwood forest. Usually, nest sites are within or adjacent to flooded timber; however, wood ducks have been known to nest up to 1 mile from water. Cavity availability is critical. Thus, artificial cavities are readily used by wood ducks and have been, most likely, the number one reason for the increase in wood duck populations over the past 50 years. Nest boxes for wood ducks should be at least 100 yards apart and should not be placed within sight of each other if possible.

### **Wildlife Management Practices:**

**Grain: Leave unharvested:** to provide additional food source for wood ducks. This is especially important in fields that can be flooded and those adjacent to a water source used by wood ducks.

**Livestock management** should prevent livestock from overgrazing in woodlots and protect trees and shrubs planted for wood ducks.

**Nesting structures:** nest boxes should be erected where suitable habitat for wood ducks exist or where planned.

**Plant Trees and Plant Shrubs (create hedgerows):** where there is a lack of emergent woody vegetation in open areas that can be flooded to create more usable space for wood ducks. Plant mast trees adjacent to or within open areas that are suitable for flooding if there is a lack of mast-producing trees in areas that can be flooded.

**Retain snags and down woody material:** when implementing Timber Stand Improvement to provide potential cavity nesting sites.

**Timber Management Techniques:** timber stand improvement practices in bottomland hardwoods that can be flooded can lead to larger crowns of favored trees and increased mast production. Woody stem density should increase following TSI and improve cover for wood ducks in those stands that can be flooded.

**Water Level Manipulation Techniques:** water control structures should be installed in existing dikes if there are none present.

**Water developments for wildlife,** specifically shallow impoundments, should be created where topography allows to create feeding and nesting space for wood ducks.

## ***Mammals***

### **Beaver**

#### **General Habitat Preference:**

The American Beaver occurs throughout most of North America. They are found in riparian areas in stages 4 and 5 of plant succession and wetlands that have permanent water with a variety of shrubs and trees adjacent to the water. They were once such a valuable fur resource that trapping led to their extirpation in many parts of their former range. The biological pendulum has now swung in the opposite direction and the lack of a viable fur market has led to increased American beaver populations throughout many areas of the United States. In some areas they have become a nuisance, cutting down trees, along with damming up ditches and streams in undesirable places. This causes cropland flooding, destabilization of road edges, and flooding of timber stands. Their presence is often a threat to timber interests where many acres of flooded timber die each year.

#### **Habitat Requirements:**

**Diet:** Primarily the bark and wood of shrubs and trees, also some forbs and grasses. Beavers store shrub and tree cuttings in caches (piles of branches) for use during the winter.

**Water:** Prefer slow-moving or still water with a constant level. Water should be of sufficient depth (5 feet) to allow free movement under the ice in winter.

**Cover:** Beaver construct lodges from sticks and mud or dig burrows in banks of streams and rivers. Beaver prefer slow-moving or still water with a constant water level. They will build dams from tree branches, shrubs, and mud to form ponds which stabilize water levels, slow water movement, and provide shelter beneath the ice in winter. In some instances, beaver dams should be protected and maintained. When beavers construct dams in places that cause problems for people, removal of the beaver is usually the best solution. If the dam is destroyed and the beaver remain, they will usually build the dam again. Where dams are to be maintained, provide dam building material such as pre-cut logs and branches in areas where such materials are scarce.

#### **Wildlife Management Practices:**

**Manipulation of Succession:** grazing management: livestock grazing should be maintained so that shrubs and trees are maintained adjacent to waters that may be used by beavers. This may include developing livestock watering facilities in upland areas to discourage congregation in and overuse of riparian areas.

**Plant Trees and Plant Shrubs (create hedgerows):** plant willows, other shrubs and deciduous trees near water that can be used by beaver for food and dam construction. If beaver are already in the area, new plantings will need protection or the beaver will need to be temporarily removed while plantings become established.

**Riparian buffers:** maintaining trees and shrubs along creeks, streams, and lakes will encourage beavers to inhabit the area.

**Increase Harvest and Decrease Harvest:** beaver can become too numerous and eat all available shrubs and trees. To prevent this it may be necessary to periodically remove some beaver from certain areas.

**Wildlife Damage Management:** should be practiced where beavers are causing problems to standing timber by girdling of individual trees or flooding standing timber stands.

# **Big Brown Bat**

## **General Habitat Preference:**

Big brown bats are 1 of 46 bat species found in North America. They inhabit nearly all of the United States, except for south Florida and south-central Texas, and utilize a variety of habitats, ranging from farmland (stage 2) to deciduous forests (stage 6). Big brown bats are very common in urban areas, including cities, parks, and suburban neighborhoods, and frequently use buildings and houses for summer roosts and winter hibernaculums. Big brown bats are insectivores. Females usually give birth to 1-2 pups in a maternity colony, often situated in a building. Big brown bats, as with all other bat species, are nocturnal and are the only truly flight-capable mammals.

## **Habitat Requirements:**

**Diet:** Big brown bats are insectivores. Most of their diet consists of night-flying insects, especially beetles. Lactating females will eat their weight in insects daily. Big brown bats hibernate in the winter in northern latitudes and therefore do not actively feed during winter months but instead rely on stored fat reserves.

**Water:** Big brown bats will drink “on-the-wing” by dipping their lower jaw into a water source. Big brown bats require water daily when they are active.

**Cover:** Big brown bats need cover for day-time roosting, hibernation, and birthing pups. Day-time roosting and hibernation generally occurs in the attic of a building or house. To a lesser extent, day-time roosting may occur in hollow trees, and hibernation may occur in caves, mines, and other areas that offer protection from predators and inclement weather. Bat houses also provide necessary roosting cover. Male and female bats often do not roost together. Males and females may roost individually or in small numbers, but larger numbers of females may roost together in a maternity roost during the time that the pups are born and nursing.

## **Wildlife Management Practices:**

**Do Not Disturb Nesting Places:** Big brown bats should not be disturbed or excluded from roosting areas from May-July in order to avoid disturbing or separating lactating females from their pups.

**Manipulation of Succession:** to maintain some open areas for bats to forage.

**Nesting Structures:** Bat boxes provide additional nesting habitat for bats

**Plant Trees:** to promote growth of deciduous trees to stage 5 and 6 for roosting and foraging sites.

**Retain Snags and Down Woody Material:** Bats will use snags for roosting. Only leave snags standing in areas where they pose no danger to human structures or human health if they fall.

**Use Pesticides Carefully:** as bats rely on a variety of insects for their food.

**Water Developments for Wildlife:** in areas where available water is not present. Any water development established for bats should be constructed with nothing above the water (for example, fencing or bracing) so bats have an unobstructed flight path to and from the water source. Besides providing a source of drinking water, water developments for wildlife also attract insects, a major food source for bats.

**Wildlife Damage Management:** may be necessary to rid bats from structures occupied by humans.

# **Black Bear**

## **General Habitat Preference:**

Black bears are found in the forested portions of North America (although they have been extirpated from some parts of the central and eastern U.S.). They are generally secretive animals who prefer to avoid human contact; however, bears are highly adaptable and may occur in and around human dwellings. Preferred habitat is mature deciduous or mixed deciduous/coniferous forest, often with some interspersions of grassy herbaceous openings, cutover timber areas, riparian corridors, shrub thickets and dense early successional brushy cover. Throughout North America black bears hibernate in the winter (even in warm climates like Florida and Louisiana). Bears use a variety of den sites that range from rock crevices, brush piles, excavations, hollow trees, dense mountain laurel/rhododendron thickets and even under human dwellings (crawl spaces, porches, etc). Bears require stages 2, 3, 4, and 6 of plant succession. Black bears are primarily nocturnal but may be seen at anytime during the day.

## **Habitat Requirements:**

**Diet:** Bears are omnivorous, however over 90% of their diet consists of vegetative matter. Spring food

sources are typically scarce and consist of early developing plants such as skunk cabbage, squaw root, grasses, and insects (ants, grubs, bee hives, etc.). Occasionally, bears will feed on deer fawns and young livestock (calves and lambs). When natural foods are scarce bears often feed on bird seed, dog/cat food, garbage, etc. making them unwelcomed guests around human residences. During summer and early fall black bears feed on a variety of fruits and berries such as blackberry, blueberry, juneberry, black cherry, pokeweed, sassafras, etc. During late fall bears will feed heavily on oak acorns, beechnuts, hickory nuts and other hard mast fruits, as well as field corn, soybeans, etc. which are all highly nutritious as the bears prepare for hibernation. During winter hibernation bears don't feed but live off their stored body fat reserves.

**Water:** Bears utilize numerous sources for water, such as: streams or creeks, ponds, lakes, rivers, waterholes and spring seeps. In summer they will often lounge in shallow water sources to cool off and get away from biting insects. Hence the term "bear wallows".

**Cover:** As mentioned above black bears use hardwood or mixed hardwood/conifer forests for habitat. Within these habitats black bears utilize large home ranges (several square miles). The size of a bears home range will vary based on sex and age of the animal and/or time of the year (for example: breeding season, fall foraging areas, denning habitat, etc.). In general, adult male bears use home ranges that are much larger than females (up to 50 sq. mi.), while solitary females and females with cubs use home ranges that are considerably smaller (15 sq. mi.).

### **Wildlife Management Practices:**

Mature hardwood or hardwood/conifer forests provide the essential elements of black bear habitat. However, within these areas bears will utilize dense brushy areas as escape cover and feeding sites (production of soft mast fruits and berries, insects, etc). Generally, water sources are not a concern because bear are very mobile. Denning sites also are quite variable and generally not a problem.

**Decrease or Increase Harvest:** This practice will influence how the bear population in an area will grow. Typically, it is the responsibility of the respective state wildlife agency to set the length of the hunting season and the season bag limit to control bear harvest. However, landowners can chose to take the maximum allowed or something less than that depending on their personal

management objective. Three population objectives can be achieved through the controlled harvest of bears: increase, stabilize or decrease the population. However, liberalizing or restricting the harvest of female bears will also influence population growth and the rate of that growth. Regulation of bear population densities will be influenced by tolerance of the public toward bear/human conflicts, property damage, livestock and agricultural damage and the desire to see bears in an area. Access to public and private land for bear hunting will also influence bear harvests in an area.

**Grain (leave unharvested):** This practice, while not widely used, can provide an additional food source for black bears. Where farmers are currently planting crops such as corn or soybeans (stage 2), strips of these crops should be left standing to provide a food source close to cover. Plots should be large (2 acres) in size and well dispersed throughout the habitat.

**Manipulation of Succession: Prescribed Burning** can stimulate understory grasses and forbs on which bears will feed (Stage 3). This practice, if hot enough, will also kill some overstory vegetation thereby stimulating development of understory shrubs and sprouts (Stage 4).

**Plant Food Plots:** This practice is not widely used but can provide an additional food source for black bears (Stage 2). Soil fertility may dictate whether this practice is feasible, since poor soils will require significant fertilizer and lime to produce abundant crops. This practice will require expenditure of money and use of farm equipment. Food plots should be large (2 acres) in size and well dispersed throughout the habitat. Plants that are high in protein such as alfalfa, clover, and soybeans, or grains high in energy such as corn, should be preferred seeds to plant.

**Plant Trees and/or Plant Shrubs** within forest openings can provide additional food sources for black bears. Fruit species such as apple, pear, cherry, peach as well as other soft mast species like autumn olive, crab apple, hawthorn, dogwood, etc. will create abundant food sources. Stage 4 and 5 plant succession.

**Retain Snags and Down Woody Material:** Retention of Den Trees within forest stands while doing timber stand improvement or clearcutting will create potential den sites for bears and many other forest wildlife species.

### **Timber Management Techniques:**

**Timber Stand Improvement or Timber Harvest, Selective Cut** practices in small amounts in Stage 5 and 6 can improve habitat by allowing the growth of dense understory cover, while enhancing the growth on many fruit and nut species. Thinning

forest stands can also increase the hard mast (acorn, hickory, beech) production thereby improving fall food sources. Den sites may also be created by brushpiles of tree limbs.

**Timber Harvest, clear-cut** within the forest habitat can create dense escape and loafing cover for bears (stage 4). These cutover areas typically create an abundance of soft mast food (grape, pokeweed, blackberry, sassafras, etc.), which bears utilize from spring to fall. Cuts should be widely dispersed throughout the forest and be no larger than 25 acres in size and have an irregular design. This practice is also useful in regenerating hard mast trees (oak, hickory, etc) when the mature trees are beginning to die out. Den sites may also be created by brushpiles of tree limbs.

**Wildlife Damage Management Techniques** may need to be employed if bear-human conflicts occur in agricultural or urban settings.

## Bobcat

### **General habitat preference:**

Bobcats occur throughout the U.S. except for some areas in the northern Midwest states where intensive agriculture occurs or in areas lacking rugged or rocky mountainous terrain or extensive bogs and swamps. Lynx occur in the northernmost forest of the U.S. and into Colorado and Nevada. Both occur in a wide variety of habitats and are often associated with rocky outcrops (stage 1) and canyons. They are also found in semi-open farmland (stage 2 and 3), brushy areas (stage 4), heavily wooded uplands and bottomland forests (stage 5 and 6). Both the bobcat and lynx are carnivorous predators and are seldom active in the daytime. They are classified as furbearer game species in many states.

### **Habitat requirements:**

**Diet:** Bobcats prey primarily upon rabbits, rodents (squirrels, chipmunks, voles, rats, and mice), opossum, raccoons, skunks, snakes wild turkeys and other birds. Bobcats may also prey upon pronghorns and deer. Bobcats have been found a significant source of mortality to pronghorn fawns, but are not considered a major source of mortality for deer. Bobcats will also prey upon domestic poultry and other livestock. Lynx prey primarily upon hares, but also eat rodents and birds.

**Water:** The water requirements of bobcats and lynx are not well known, but they do drink free-standing water.

**Cover:** Bobcats and lynx use dense cover, rocky

outcrops and ledges, hollow logs and other sheltered spots for denning. They forage where prey is most numerous.

### **Wildlife Management Practices:**

**Decrease/ Increase Harvest:** Harvest levels may need to be adjusted accordingly depending on population status.

**Manipulation of succession:** through mowing, chaining, roller beating, controlled burning, disking, chemical application and grazing can be used to maintain and rejuvenate areas of stages 3 and 4 when habitat quality begins to decline for desired prey in those habitats. Livestock grazing management should prevent overgrazing that would degrade habitat quality for rabbits, rodents and other prey.

**Plant Trees and Plant Shrubs (create hedgerows):** in areas where additional stage 4 is needed to attract prey and provide security cover for bobcats. Hedgerows across relatively large open fields will provide more useable space for bobcats and prey.

**Retain snags and down woody material:** to provide denning sites and habitat for prey.

**Timber Management Techniques:** Timber harvest will provide increased dense cover for additional prey within large areas of stage 6 forest where regeneration is needed.

Timber stand improvement practices can provide enhanced understory development that can lead to increased prey populations.

**Wildlife damage management:** may be necessary if bobcats become problematic where poultry or other livestock occur.

## Coyote

### **General Habitat Preference:**

Coyotes are found throughout the continental United States. Coyotes have also been observed in large cities and urban areas. Stages 2, 3, and 4 are primary coyote habitats, particularly grasslands and areas where timberlands have been cleared for agriculture. They may occasionally be seen in woodlands. Coyotes den in a wide variety of places, including brush-covered slopes, steep banks, rock ledges, thickets, and hollow logs. Coyotes may be active throughout the day but tend to be more active during the early morning, around sunset, and at night. Coyotes live in packs, alone, or in mated pairs depending on the time of year.

### **Habitat Requirements:**

**Diet:** Coyotes eat, insects, rodents, birds, rabbits,

deer, small mammals, carrion, and fruit. Livestock and wild ungulates (deer, elk, pronghorn) are represented in coyote stomachs PRIMARILY as carrion. However, in some cases, coyotes have been shown to prey heavily on deer and pronghorn fawns; limiting reproductive success. In 16 studies, coyotes were responsible for 82% of all sheep losses that were due to predators, but it is important to stress that only a few flocks typically showed sizeable losses. Often it is individuals that cause large livestock losses and control of that individual is warranted. It is also important to consider that coyote predation is not the major cause of loss in many cases.

**Water:** Water requirements for coyotes are not well documented. Much of their water requirements should be met in their diet.

**Cover:** This species is highly adaptable and is found in varied habitats and plant succession states. However, they do tend to favor areas dominated by grasses and shrubs (stages 2-4). This is probably due to higher prey densities in these areas. Den sites for raising pups are often selected in banks, ledges, or under abandoned buildings.

### **Wildlife Management Practices:**

**Establish Native grasses and forbs** to provide cover for the prey base for coyotes.

**Manipulation of Succession:** grazing management: Manage livestock grazing so that adequate cover for prey is retained.

**Plant Shrubs (create hedgerows):** Plant shrubs where cover is sparse.

**Forest Management Techniques:** using small clear-cuts can increase prey abundance.

**Wildlife Damage Management Techniques:** In some instances the predatory habits of the coyote can be a problem for wildlife managers and livestock producers; therefore wildlife damage management may be necessary.

## **Eastern Cottontail**

### **General Habitat Preference:**

As their name implies, Eastern Cottontails occur in the eastern half of the country. They prefer stages 3 and 4 of plant succession. Ideally, habitat components made up of 1/3 grassland, 1/3 cropland, and 1/3 shrub cover all interspersed together. Eastern cottontails may live in urban areas as well, and may be found in parks, golf courses, and stream corridors.

### **Habitat Requirements:**

**Diet:** A variety of forbs and grasses are eaten from spring through fall. In winter bark of shrubs and trees are often eaten. They will also eat buds, soft mast, grain, and leaves and twigs.

**Water:** Necessary water is obtained from diet.

**Cover:** Cottontails use thick shrub or herbaceous vegetation (stages 3 & 4) for hiding and resting cover.

### **Wildlife Management Practices:**

**Decrease/Increase Harvest:** Harvest levels may need to be adjusted accordingly, depending on the population status.

**Establish Native Grasses and Forbs** for cover and food.

**Grain: Leave Unharvested:** This is useful to provide additional grain sources.

**Harvest Timing of Crops:** Delaying the harvest of crops may reduce destruction of nests.

**Manipulation of succession:** Brush chopping, chaining/roller beating and prescribed burns can be used to maintain or rejuvenate small areas of stage 3 and 4 vegetation. In areas dominated by mesquite, root plowing combined with the seeding of grasses and legumes may be the best way to maintain small areas in stage 3 vegetation.

Livestock grazing management to avoid use of food and cover plots, and leave ample amounts of herbaceous vegetation in other areas used by cottontails for food and cover.

**Plant food plots:** Plant 1/8 to 1/4 acre annual food plots (grain sorghum is good) in areas with too little cropland; one plot per 15 acres maximum. Plant 1/8 to 1/4 acre perennial food plots (grass and clover) in areas with too little grassland, again, one plot per 15 acres maximum.

**Plant Shrubs (create hedgerows):** Plant shrubs in large areas of stage 2 and 3 of plant succession, or in agricultural areas having few trees or shrubs. Plant along field borders, fence rows, or other idle land areas. This is also appropriate for open areas in urban settings.

**Tillage Management:** Tillage of cropland may be delayed in spring to allow the use of standing stubble for cover. Tillage may be eliminated in the fall to allow wildlife access to waste grain.

**Forest Management Techniques:** timber harvest: Clear-cut small areas (10 acres maximum) in large expanses of stage 5 and 6 woodlands.

**Wildlife Damage Management Techniques:** When overabundant, they can cause damage to ornamental/landscaping and garden plants and may require wildlife damage management

techniques to be employed.

## **Eastern Gray Squirrel**

### **General habitat preference:**

The eastern gray squirrel lives primarily in stage 6 deciduous forests and woodlands. They also forage along the edge of crop fields, especially harvested cornfields. These squirrels have adapted to parks and other urban areas where mature trees are available.

### **Habitat requirements:**

**Diet:** Squirrels eat a variety of acorns, nuts, miscellaneous seeds, grains, buds, and mushrooms. Squirrels spend most of their time foraging on the ground, but also forage in trees where they collect fruits, nuts, bark, and buds that haven't yet fallen to the ground. They will also eat eggs.

**Water:** Water requirements are generally met through the food consumed; however, squirrels will drink free-standing water.

**Cover:** Squirrels den in tree cavities and build nests out of leaves and twigs. Nests are generally more than 30 feet aboveground.

### **Wildlife Management Practices:**

**Decrease/ Increase Harvest:** Harvest levels may need to be adjusted accordingly depending on population status.

**Grain: Leave Unharvested** (especially corn) so squirrels can glean waste grain from the field. This is especially important during years of poor mast production.

**Manipulation of Succession:** Livestock grazing management should protect trees and shrubs planted for squirrels and protect woods from overgrazing.

**Nesting Structures** can provide places for squirrels to birth and raise young.

**Plant Food Plots** for additional food and cover

**Plant Trees and Plant Shrubs (create hedgerows):** to create hedgerows across large fields and in "odd areas" of crop fields that are not planted to crops. Plant mast trees where stages 5 and 6 represent less than 50 percent of the area considered and where stages 5 and 6 forest contain few or no mast-producing trees.

**Retain snags and down woody material:** when implementing Timber Stand Improvement practices.

**Tillage: management:** eliminate tillage in the fall, especially in cornfields adjacent to stage 5 and 6 forest.

**Forest Management Techniques:** timber stand improvement will encourage larger crowns of mast-producing trees and enable oaks, hickories, beech, and others to produce more mast.

**Wildlife damage management:** may be required if squirrels become a nuisance around houses.

## **Mink**

### **General Habitat Preference:**

Mink are found in Alaska, Canada and across most of the United States. They prefer habitat associated with stream and river banks and the shores of a variety of wetlands.

### **Habitat Requirements:**

**Diet:** The mink is strictly carnivorous. Rabbits, mice, waterfowl, muskrats, fish and crayfish are all used for food, depending on availability. Most food is found in close association with dense vegetation along the shores of wetlands.

**Water:** Mink are found in association with water. See cover requirements below.

**Cover:** Mink use dens made in log jams, under tree roots, old muskrat burrows, and rock piles. The availability of den sites is considered to be a key factor in determining how many mink use an area. Areas with lots of trees and shrubs and limited livestock grazing near shorelines usually have more potential den sites.

### **Wildlife Management Practices:**

**Manipulation of Succession:** use prescribed burns and brush chopping to rejuvenate old decadent wetland vegetation that in turn can improve the habitat for the animals that mink use for food. Grazing Management: manage livestock grazing to maintain healthy vegetation along the banks and shores of streams, rivers, and other wetlands. In some regions this may include the development of livestock watering facilities in uplands to discourage congregation in and overuse of riparian areas.

**Ponds: Construction:** construct ponds with shallow water areas where emergent vegetation can grow.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding: small dikes can be used to temporarily flood areas which can improve habitat for animals mink use for food. Water Control Structures: control water levels to promote the growth of emergent aquatic vegetation adjacent to open water.

**Wildlife Damage Management:** mink can eat significant numbers of upland nesting waterfowl or game bird young, especially in areas where nesting habitat is limited. In such cases, favorable habitat can be reduced or a trapping program can be implemented to utilize the valuable fur resource that mink provide.

## Muskrat

### **General Habitat Preference:**

Muskrats are found throughout the United States where sufficient water is available. They prefer stage 2 and 3 wetlands interspersed (mixed) together.

### **Habitat Requirements:**

**Diet:** Muskrat eat the roots, tubers, and green vegetation of emergent aquatic vegetation such as cattails and bulrushes.

**Water:** Muskrats need water of sufficient depth (4 feet) or flowing water that allows free movement under ice during the winter. During warm seasons, they prefer water one to two feet deep, with around 20 percent of the wetland comprised of open water free of emergent aquatic vegetation. Controlling the water level when possible can be a beneficial management practice.

**Cover:** Muskrat build lodges out of bulrushes and cattails, which are usually placed in dense growths of cattails and bulrushes. They rest on open shorelines, floating logs, or on tops of lodges. They also make dens in banks.

### **Wildlife Management Practices:**

**Manipulation of Succession:** use prescribed burns and brush chopping to rejuvenate old, decadent wetland vegetation. Grazing Management: manage livestock grazing to maintain healthy vegetation along the banks and shores of streams, rivers, and other wetlands. In some regions this may include the development of livestock watering facilities in uplands to discourage congregation in and overuse of riparian areas.

**Ponds: Construction:** ponds and wetlands can be constructed with shallow water areas where emergent aquatic vegetation can grow.

**Water Level Manipulation Techniques:** Small Dikes for Temporary Flooding: small dikes can be used to temporarily flood areas to promote the growth of cattails and bulrushes. Water Control Structures: used to control water levels for providing areas in wetlands with water less than two feet deep where cattails and bulrushes can

grow. Up to 80 percent of the wetland should be able to grow such vegetation.

**Wildlife Damage Management:** burrowing and denning activities can cause problems in flooded agricultural areas such as rice fields. In such instances, populations can be reduced by managing against preferred habitat conditions or by legal harvest during trapping season. This can be done as an economic incentive since muskrat pelts have a value in the fur trade depending on current market conditions.

## Raccoon

### **General Habitat Preference:**

Raccoons are very common throughout most of the United States except in certain parts of the Rocky Mountains, Nevada, Utah, and Arizona. Raccoons are most abundant near water, riparian areas and lands adjacent to wetlands. They are also found in urban areas. They prefer areas interspersed with different successional stages. Riparian areas in stages 5 and 6 of plant succession are ideal. Raccoons nest in hollow trees, underground dens, or in chimneys, attics, and crawl spaces of houses and buildings. They are omnivorous and eat a wide range of foods.

Raccoons can become pests in urban areas and in wetlands where waterfowl nesting is important. In such instances, the management objectives may be to make the habitat less suitable for raccoons. They are also major predators of quail and turkey nests in the southeast. Wildlife damage management may be necessary.

### **Habitat Requirements:**

**Diet:** Raccoons eat a wide variety of foods consisting of garbage, birds, worms, eggs, fish, small mammals, insects, crayfish, **frogs, lizards, snakes, carrion**, grains, seeds, fruits, **nuts**, and foods prepared for human and pet consumption.

**Water:** Raccoons require water frequently during warm seasons.

**Cover:** Raccoons nest and rest during the day in natural tree cavities, dens in the ground, under brush and junk piles, in old abandoned buildings, and rocky cliffs and ledges.

### **Wildlife Management Practices:**

**Grain: leave unharvested:** Leave small areas of grain crops adjacent to woodlands unharvested.

**Manipulation of succession:** prescribed burns and brush chopping can be used to rejuvenate old

decadent wetland vegetation. These practices along with chaining, roller beating and root plowing can be used to revert succession from stages 5 and 6 vegetation to stages 2, 3, and 4 in appropriate regions. Grazing management: Manage livestock grazing to maintain healthy vegetation along the banks and shores of streams, rivers, and other wetlands. In some regions this may include the development of livestock watering facilities in uplands to discourage congregation in and overuse of riparian areas.

**Plant food plots**: Plant annual food plots to grains.

**Plant Trees and Plant Shrubs (create hedgerows)**: Plant and maintain large deciduous trees especially in riparian areas and areas adjacent to wetlands. Maintain corridors. Riparian buffers.

**Timber Management Techniques**: Timber harvest: Clear-cut small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 5 and 6 vegetation. Selective-cut timber management.

**Water developments for Wildlife** can provide a source of drinking water and areas for foraging for food.

**Water Level Manipulation Techniques**: Water control structures: Control water levels with water control structures. Provide areas in wetland with water less than 2 feet deep where aquatic emergent vegetation can grow. Provide shallow water areas in existing ponds and wetlands where emergent vegetation can grow.

**Wildlife damage management**: may be necessary if raccoons invade garbage cans, occupy residences or buildings, or cause depredation of poultry. Exclusion is a cost-effective management practice. Harassment can be effective. Cultural modification like using wildlife-proof trash cans is very effective. Trap and relocate or trap and euthanize is effective for problem raccoons

## **White-tailed Deer**

### **General Habitat Preference:**

White-tailed deer occur in the eastern two-thirds of the country. They prefer stages 3, 4, and 5 of plant succession, all interspersed together.

White-tailed deer can be a nuisance when their habitat and home range overlap areas occupied by people. Therefore, wildlife damage management techniques apply in some cases.

## **Habitat Requirements:**

**Diet**: **White-tailed deer prefer** a variety of shrubs, forbs, grasses, and waste grain. Acorns and nuts from mast trees are favorite foods. In the northern parts of the range for white-tailed deer, they will browse on conifer trees in the winter.

**Water**: White-tailed deer drink free water when it is available. They obtain most of their water from food items. Water developments are especially important in more arid regions.

**Cover**: White-tailed deer use woodlands and tall shrubs for hiding and travel cover. They also use tall emergent aquatic vegetation in riparian areas and brushy upland drainages for cover in the Great Plains Grassland Region.

## **Wildlife Management Practices:**

**Establish native grasses and forbs**: in fields in large expanses of stage 4, 5, and 6 vegetation.

**Grain: leave unharvested**: in small areas of cropland adjacent to woodlands.

**Harvest Timing of Crops**: of crops and hay so that fawning sites are not disturbed.

**Manipulation of succession**: prescribed burning at three-year intervals in stage 5 pine woodlands or periodically in stage 3 and 4 vegetation. Brush chop, chain/ roller beat small areas to maintain stage 3 and 4 vegetation. In areas dominated by mesquite, root plowing combined with the seeding of grasses and legumes may be the best way to maintain small areas in stage 3 vegetation.

Livestock grazing management should be used to leave some forbs, grasses, shrubs, and trees available for food and cover. This is particularly important in riparian areas in the Great Plains Grassland Region.

**Plant food plots**: Plant several one acre perennial food plots of grass and clover in large expanses of stage 5 and 6 woodland. Plant annual food plots to grain.

**Plant Trees and Plant Shrubs (create hedgerows)**: in ravines, along field borders, and other idle land areas. Provide corridors for travel lanes in open areas.

**Tillage management**: eliminate fall tillage of grain crop residue adjacent to woodlands.

**Forest Management Techniques**: timber harvest: Clear-cut small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 5 and 6 woodlands. Selective-cut timber management of stage 5 and 6 woodlands.

**Water Developments for Wildlife** will provide an external water source for drinking.

**Wildlife Damage Management Techniques:**

Deer can seriously degrade habitat when overpopulated. Increasing or Decreasing Harvest is essential for proper management. Other damage management techniques such as fencing may be helpful.

## ***Other Species***

### **Bluegill**

#### **General Habitat Preference:**

Ponds, lakes, and slow moving rivers.

#### **Habitat Requirements:**

**Food:** Bluegill eat a variety of zooplankton (microscopic animal life), insects, tadpoles, small minnows, and crayfish.

**Cover:** Bluegill are often found near submerged rocks, stumps, shrubs, and near aquatic vegetation where small fish (used for food) hide.

**Water:** Fish need water of a certain quality. Some of the basic requirements are: dissolved oxygen - minimum of 4 parts per million (ppm); carbon dioxide - should not exceed 20 ppm; pH should range between 6.5 and 9.0; and water temperature should reach at least 70 degrees Fahrenheit sometime during the summer (one foot below surface in shade). Test the water to see if it meets requirements. Aerate pond to increase oxygen and decrease carbon dioxide.

#### **Management Practices:**

**Decrease or Increase Harvest** based on seine sample results.

**Fish or Wildlife Survey:** to determine pond balance.

**Manipulation of Succession:** Grazing Management; Manage livestock grazing to maintain thick

herbaceous vegetation surrounding the pond and in the watershed that drains into the pond. Develop livestock watering facilities away from pond or allow access to only a small part of the pond.

**Ponds: Construction:** Artificial reefs constructed of rock piles, sections of plastic or cement pipe (a minimum of 6 inches in diameter and 18 inches long), and brush piles and tires (sunk with weight) can be used for additional cover. These practices are recommended for ponds larger than 10 surface acres in size.

**Ponds: Deepen Edges:** Deepening the pond edges to 2 feet deep or more discourages rooted

aquatic vegetation growth.

**Ponds: Fertilize:** In clear water, fertilizer may be added to increase or promote phytoplankton. Lime ponds (agricultural limestone) to increase soil pH if total alkalinity is below 20 ppm.

**Ponds: Reduce Turbidity:** Prevent or clear up muddy water (brown or gray color). Muddy water blocks sunlight needed in producing phytoplankton. Maintain a green color in pond water (green enough that a white disk cannot be seen 24 inches deep). The color is caused by phytoplankton (microscopic plant life-algae). Reseed watershed to establish thick herbaceous vegetation surrounding the pond in the watershed that drains into the pond.

**Ponds: Repair Spillway:** Repair the spillway if needed and remove trees near the dam or dikes. Stop other pond leaks if and when they occur.

**Ponds: Restock:** Determine pond balance using a minnow seine and catch records. A bass to bluegill ratio of 3 to 6 pounds of bluegill to one pound of bass is considered a good fish population balance. If restocking is necessary, remove existing fish and restock at the appropriate rate.

**Water Level Manipulation Techniques:** Add water control structures if needed.

### **Box Turtle**

#### **General Habitat Preference:**

Found throughout most of the eastern and central portions of the U.S. Depending on subspecies, this animal is found in forest or grasslands with a dense understory and diverse plant community. They are not aquatic, but are often found near water.

#### **Habitat Requirements:**

**Diet:** The diet of this omnivore is highly diverse and includes insects, fruit, mushrooms, berries, various vegetation, and carrion.

**Water:** This species likely obtains most of its water requirements from food.

**Cover:** This species prefers to construct nest in open areas (stages (2-4) that are warmer due to increased sunlight. In forested areas, this may be at forest edges or within open areas of the forest.

#### **Wildlife Management Practices:**

**Manipulation of Succession:** through prescribed burning can maintain a dense herbaceous understory of plants provided the frequency of fire is at the correct interval for that site. Livestock grazing management can be used maintain adequate herbaceous vegetation for this species.

**Establishment of Native Grass and Forbs:** in

areas with too little herbaceous matter will be beneficial.

**Timber Management Techniques:** Timber Harvest or Timber Stand Improvement can create more herbaceous vegetation that box turtles feed upon.

## **Bullfrog**

### **General Habitat Preference:**

The bullfrog's native range extends from the Atlantic Coast eastward to eastern Colorado and eastern Mexico, and from southern Colorado south to northeastern Mexico. This species is not native west of the Rocky Mountains, but has been successfully introduced in many localities. Bullfrogs inhabit permanent bodies of standing or slow-moving water. They prefer shorelines with dense vegetation (stages 3 and 4 of wetland succession), adjacent to shallow open water areas (stage 2) dominated by floating and submerged aquatic vegetation. All habitat requirements are often found in and around a single pond.

### **Habitat Requirements:**

**Diet:** Major components of the diet are snails, insects, crayfish, other frogs, fish, reptiles, and occasionally small mammals and birds.

**Water:** Bullfrogs need stable water levels for hibernation and egg development. Water levels should be maintained at a constant level when possible.

**Cover:** Bullfrogs use dense emergent aquatic and upland herbaceous vegetation adjacent to water for hiding and foraging.

### **Wildlife Management Practices:**

**Ponds: Construction:** when ponds are constructed, provide for shallow water areas. In some areas of the pond, this will require foregoing the practice of deepening pond edges.

**Ponds: Repair Spillways:** spillways should be maintained to allow ponds to stabilize to proper water levels following large rainfall events.

**Riparian Buffers:** vegetation should be maintained along creeks, streams, lakes, and ponds to provide habitat for bullfrogs.

**Water Level Manipulation Techniques:** Water Control Structures: should be in place and operative in order to hold water levels at desired shallow water depths for optimum bullfrog habitat.

## **Butterflies**

### **General Habitat Preference:**

There are hundreds of butterfly species in America that occupy nearly every ecotype available. In urban areas butterflies are found in gardens, yards, and parks planted with shrubs and flowers that attract butterflies. They often lay eggs on a specific kind of plant. They eat food in liquid form.

### **Habitat Requirements:**

**Diet:** Usually consists of sweet liquids such as nectar from flowers. They will also leaves and twigs, forbs, and grasses as caterpillars.

**Water:** Some butterflies can be seen collecting on moist sand or mud around water puddles.

**Cover:** Butterflies need shelter from wind. Plant the above in areas sheltered from the wind.

### **Wildlife Management Practices:**

**Artificial Feeders** can supplement food resources in areas where butterflies exist.

**Establish Native Grasses and Forbs** for butterflies to provide food and cover.

**Plant flowers:** Plant and maintain specific types of plants for butterflies to lay eggs on: dogbanes, milkweeds, asters, goldenrods, wintercress, vetches, blackberries, sunflowers, iron weed, and verbenas. Rooftop and balcony gardens planted with some of the plants mentioned above may attract butterflies.

**Plant Trees and Plant Shrubs (create hedgerows):** Plant and maintain bushes and flowers that attract butterflies. Some examples are aster, verbena, zinnia, marigold, lilac, bush cinquefolia, and butterfly plant.

**Use pesticides carefully.**

**Water developments for wildlife:** Provide an area with shallow, moist areas for nesting butterflies.

## Frogs

### **General Habitat Preference:**

There are many frog species that inhabit wetland areas throughout the United States. Weeds and aquatic vegetation on the edges of ponds, lakes, and slow moving streams are preferred areas. Mud bottoms are needed so frogs can bury themselves for hibernation during the winter. Frogs typically breed in water and lay their eggs in water. Frogs are carnivorous and eat a varied diet of insects.

### **Habitat Requirements:**

**Diet:** Primarily insects, **but will also eat aquatic plants, worms, eggs, frogs, and snails**

**Water:** Frogs need water to hide. Many kinds of frogs will dry up and die if their skin is not kept moist. (See discussion in "Cover" section.)

**Cover:** Thick herbaceous vegetation on bank or shore adjacent to water. Frogs also hide among floating vegetation in the water next to the shore.

### **Wildlife Management Practices:**

**Establish Native Grasses and Forbs** around water sources to provide cover for frogs.

**Use pesticides carefully**

**Water Developments for Wildlife:** Creating water developments for wildlife creates aquatic habitat for amphibians like frogs.

**Water Level Manipulation Techniques:** Water control structures: Control water levels with water control devices to insure adequate water depth for hibernation. This is also useful for encouraging emergent aquatic vegetation.

## Largemouth Bass

### **General Habitat Preference:**

Ponds, lakes, and slow moving rivers.

### **Habitat Requirements:**

**Diet:** Young bass eat insects and other invertebrates (worms, crayfish, and zooplankton). These invertebrates depend on phytoplankton for food. Adult bass eat other small fish such as bluegill and a variety of minnows, tadpoles, and crayfish, and even ducklings.

**Cover:** Bass are often found near submerged rocks, stumps, shrubs, and near aquatic vegetation where small fish (used for food) hide.

**Water:** Fish need water of a certain quality. Some of the basic requirements are: dissolved oxygen -

minimum of 4 parts per million (ppm); carbon dioxide - should not exceed 20 ppm; pH should range between 6.5 and 9.0; and water temperature should reach at least 70 degrees Fahrenheit sometime during the summer (one foot below surface in shade). Test the water to see if it meets requirements. Aerate pond to increase oxygen and decrease carbon dioxide.

### **Wildlife Management Practices:**

**Decrease or Increase Harvest** based on seine sample results.

**Fish or Wildlife Survey:** to determine pond balance.

**Manipulation of Succession:** Grazing Management: Manage livestock grazing to maintain thick

herbaceous vegetation surrounding the pond and in the watershed that drains into the pond. Develop livestock watering facilities away from pond or allow access to only a small part of the pond.

**Ponds: Construction:** Artificial reefs constructed of rock piles, sections of plastic or cement pipe (a minimum of 6 inches in diameter and 18 inches long), and brush piles and tires (sunk with weight) can be used for additional cover. These practices are recommended for ponds larger than 10 surface acres in size.

**Ponds: Deepen Edges:** Deepening the pond edges to 2 feet deep or more discourages rooted aquatic vegetation growth.

**Ponds: Fertilize:** In clear water, fertilizer may be added to increase or promote phytoplankton. Lime ponds (agricultural limestone) to increase soil pH if total alkalinity is below 20 ppm.

**Ponds: Reduce Turbidity:** Prevent or clear up muddy water (brown or gray color). Muddy water blocks sunlight needed in producing phytoplankton. Maintain a green color in pond water (green enough that a white disk cannot be seen 24 inches deep). The color is caused by phytoplankton (microscopic plant life-algae). Reseed watershed to establish thick herbaceous vegetation surrounding the pond in the watershed that drains into the pond.

**Ponds: Repair Spillway:** Repair the spillway if needed and remove trees near the dam or dikes. Stop other pond leaks if and when they occur.

**Ponds: Restock:** Determine pond balance using a minnow seine and catch records. A bass to bluegill ratio of 3 to 6 pounds of bluegill to one pound of bass is considered a good fish population balance. If restocking is necessary, remove existing fish and restock at the appropriate rate.

**Water Level Manipulation Techniques:** Add

water control structures if needed.