WILDLIFE JUDGING

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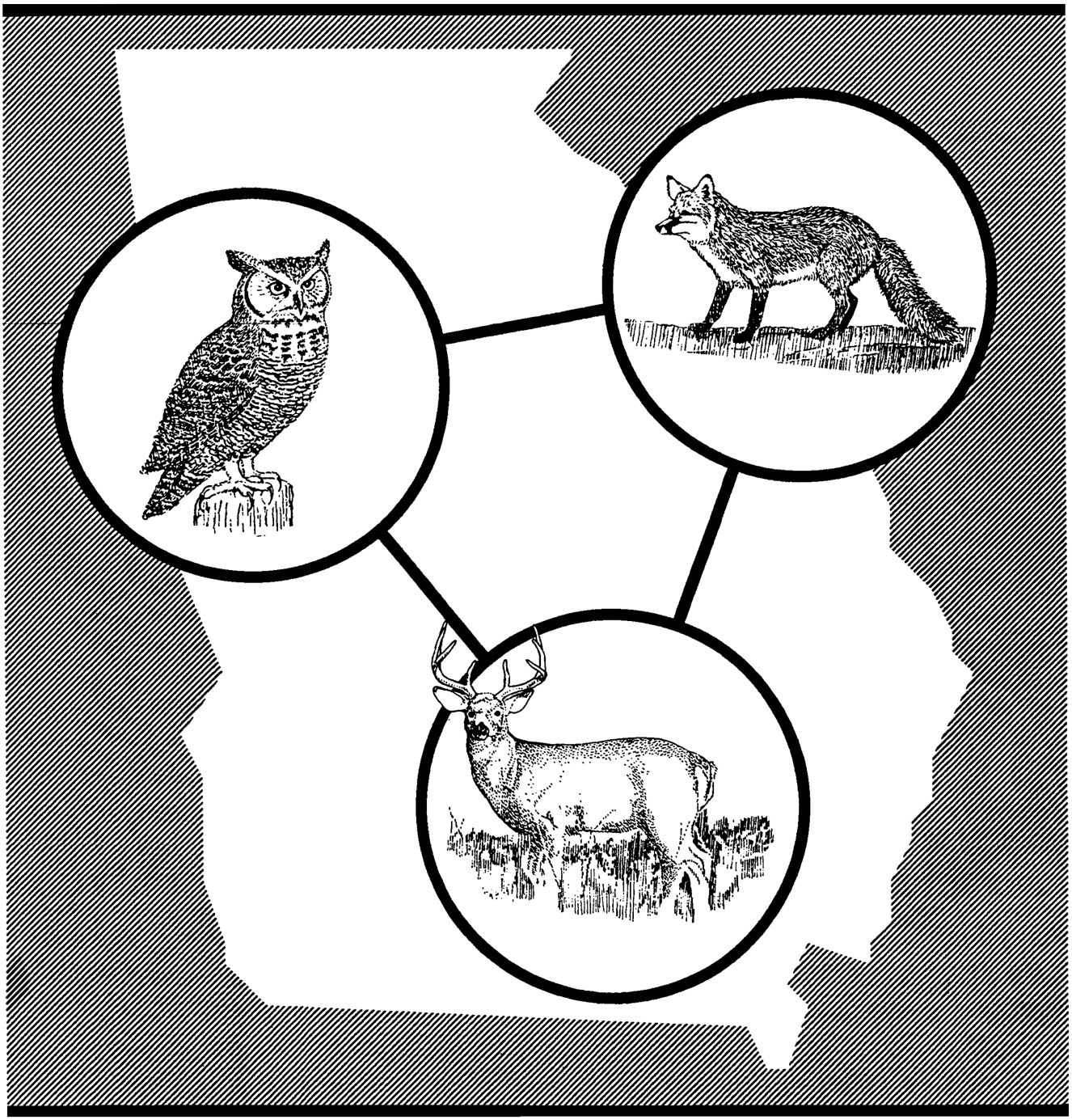

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Acknowledgments:

The Georgia 4-H Wildlife Judging Manual was adapted in format from the Wildlife Habitat Evaluation Program National Manual, edited by Ron Masters, Champe Green, Jim Armstrong and Charles Lee.

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Preparing for Contests

Participants should first read and understand the *Concepts* section of the member manual. Leaders should explain the concepts and, when needed, provide local examples to clarify any misunderstandings. This section is important because many of the activities require understanding of the concepts.

Once the concepts are understood, the leader should review the regional description with the participants. Leaders have the flexibility to use any of the information about the region that they feel is appropriate. Participants and leaders should review plant succession processes, special habitats such as riparian, common plants, wildlife species, and management practices. Specific information about habitat requirements and recommended management practices are found in the *Wildlife Species* section where wildlife species are listed in alphabetical order by the accepted common name. **Whenever possible, participants should go to the field and find examples of the principles and practices found in these sections.** Leaders can use "quiz bowls" and question-answer sessions to measure learning.

Following the above exercises, leaders can introduce participants to the various activities found in the manual. Conducting practice sessions using aerial photographs and outdoor sites will be helpful. Start with only two or three wildlife species, adding more as participants become more knowledgeable. Obtain several aerial photographs (local Soil Conservation Service Offices) preferable with a scale of 8 inches equals 1 mile, and discuss their features. Explain to participants how these features are important to wildlife. Identify the habitat requirements that are available for the animals selected. Then ask participants to identify what needs are missing. As participants become more skilled, have them rate a set of photos as to the value for different wildlife species. Review their ratings. To practice giving oral reasons, have them justify their ratings. Review the *Foods* section and practice identifying foods used by the various wildlife groups.

Beginning and young 4-Hers are not expected to perform all the activities. Junior 4-Hers (5-8th grades) will be required to know only eight species for Habitat Management and Aerial Photos. Those species are: Brown Thrasher, Eastern Bluebird, Eastern Cottontail, Eastern Gray Squirrel, Northern Bobwhite, White Tail Deer, Bluegill and Large Mouth Bass. Juniors will only be required to know identification of food categories and not which species consumes a displayed food item.

Concepts

Concept 1

Habitat Requirements

Wildlife have life requirements that must be supplied by the habitat to ensure their well being. These are known as habitat requirements. The four basic habitat requirements are food, water, usable space, and cover (shelter). Each species has its own set of specific requirements. For example, the gray squirrel uses acorns for food, while the woodpecker eats insects. Mallards use thick grass and forb cover for nesting, while thrashers nest in shrubs. Habitat requirements for wildlife change during the seasons of the year. The food they eat in the winter may be much different than what is eaten in the summer. The cover they need for nesting may be much different than the cover needed for a winter storm.

Concept 2

Featured Species

There are two basic goals in wildlife habitat management. One is to provide the best habitat possible for featured wildlife species. The other, which is explained later in this handbook under the concept "Species Richness," is to provide habitat for as many different wildlife species as possible in an area.

When evaluating habitat for featured species, one must first decide which species are to be favored. This can be done in several ways. Landowners may have specific objectives for certain species, or the general public may have concerns about a particular game or endangered species. Once the species are selected, identify the habitat requirements for each species and evaluate the capability of the environment to provide the requirements. If the area is unable to supply or only partially provides the necessary habitat requirements, management practices may be used to improve the area's ability to supply needed requirements.

It is usually best to select management practices that provide the habitat requirements that are most lacking and thus limiting the population. For instance, if a species requires trees for cover with water nearby and the habitat you are evaluating has plenty of trees but no water, a management practice that supplies water will improve the habitat more effectively than planting trees. When determining which management practices to apply, remember that management practices that improve habitat for some wildlife species may be detrimental to other wildlife species. It is impossible to manage habitat for any one species without influencing other species in some manner.

Concept 3

Species Richness

Species richness" is the number of different kinds of wildlife species that are found in an area. One goal in wildlife habitat management may be to provide habitat for as many species and as many individuals within a species as possible, as contrasted to managing for a featured species (see Concept 2).

Lands that are high in species richness usually have many of the following characteristics:

1. **A mixture of areas in different successional stages**
2. **A balance of edges with unbroken blocks of vegetation in one successional stage**
3. **Unbroken (unfragmented) areas of at least 10 to 40 acres**
4. **Edges with low contrast**
5. **A wide variety of vegetation layers present within each area**

These characteristics can be used to estimate the relative number of different wildlife species that may be present in separate areas. They can also be used to identify management practices that could increase species richness. For example, consider an area that is in stage 6 of plant succession (see Concept 4). It has been proposed to harvest the trees by clear-cutting 1/2 of the area. Clearcuts of 40-acres that leave adjacent unharvested areas of 40 acres in size would be desirable. Strips or corridors of trees that link the larger unharvested areas together could be left uncut (see Wildlife Management Practice 6).

Remember, when managing habitat for species richness, often it is not possible to provide the best habitat for featured species. Instead of providing the best habitat possible for a few species, the goal is to provide some habitat for as many species as possible.

Concept 4

Plant Succession and Its Effect on Wildlife

Vegetation and water are the basis of habitat management. Every acre of soil and water has a definite sequence in plant cover that occurs over time. The different stages of this sequence are called successional stages. We can generally predict the type of vegetation that will occur in each stage until a final or "climax" stage is reached. When not disturbed, the climax vegetation will remain the same for long periods of time. If people **or** nature disturb the vegetation, soil, or water level, succession may be set back and the cycle will continue forward from the new starting point. Note that different wildlife species are often associated with the different stages of plant succession. **Not all species require the climax stage**.

In this handbook, areas in different stages of plant succession are often referred to as areas with different vegetation types or habitat types. In general, the stages of plant succession that occur on land are as follows:

1. **Bare ground**
2. **Annual forbs and/or grasses**
3. **Perennial forbs and grasses**
4. **Shrubs**
5. **Young woodland or trees (less than 70 years old)**
6. **Mature woodland or trees**

In some regions, natural factors such as the soil or the climate will prevent succession from proceeding past a certain stage. For instance, in the Great Plains Shortgrass Prairie Region, lack of precipitation often prevents succession from proceeding past stage 3. In this case, stage 3 would be considered the climax stage. **Many wildlife species found in this region do not require trees.**

Descriptions of typical successional stages found in Georgia can be found in the *Regions* section of this handbook. A description of the typical successional stages occurring in relation to water can be found in the Wetland Region description. The stages of plant succession are illustrated below.

A single step in this succession may take weeks, months, years, or even centuries, depending on a variety of natural and human-caused factors. If vegetation is disturbed, succession will revert to an earlier stage and begin again. Disturbance can be caused by natural factors such as insect or disease outbreaks, tornadoes, hurricanes, avalanches, or fires. Some wildlife species require periodic disturbance.

However, succession is more frequently altered by humans through plowing (agriculture), burning, cutting of forests, grazing, and clearing shrubby areas, all of which may mimic natural disturbances in many cases.

Nature never gives up. Even abandoned concrete parking lots are eventually taken over by plants. Plants first grow in the cracks and around the edges, then if left alone, a concrete parking lot will eventually become "habitat" for some wildlife species.

Stage 1 Stage 2 Stage 3 Stage 4 Stage 5 Stage 6

Concept 5

Vertical Structure (Layering)

Vegetation can be classified by how it grows. Grasses and forbs generally grow close to the ground and make up the ground layer. The next higher level is usually composed of shrubs and is called the shrub layer. The tallest stratum is made by trees and is called the tree canopy.

How different layers of vegetation are arranged in relation to each other is important to many wildlife species. For instance, some species may require a herbaceous layer for food but also need a tree canopy for cover. Not all areas in a single stage of succession are alike. One woodland in stage 6 of succession may have a variety of layers comprised of grasses, forbs, shrubs, and trees, while another stage 6 woodland may have only one distinct layer of tall trees. The trees may be widely spaced or close together, with or without a shrub layer.

Tree Canopy

Shrub Layer

Herbaceous Layer

Concept 6

Arrangement and Interspersion

How different successional stages or vegetation types are situated in relation to each other (for example, size, shape, distribution of habitats) is often referred to as horizontal arrangement. Many wildlife species need more than one successional stage to provide all their habitat requirements. To be of value to a wildlife species, the required successional stages must be close to each other or linked by corridors (see Wildlife Management Practice 6) to allow for safe travel. Some species obtain all their habitat requirements from only one successional stage. Managing for areas of different successional stages within a landscape is called "interspersion." Usually, more interspersion supports a greater variety of wildlife. A way to measure interspersion is explained in the *Activities* C-I section.

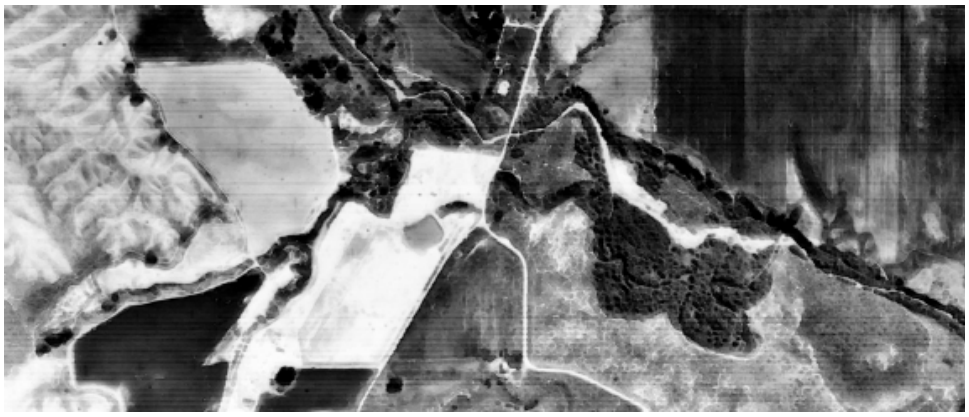


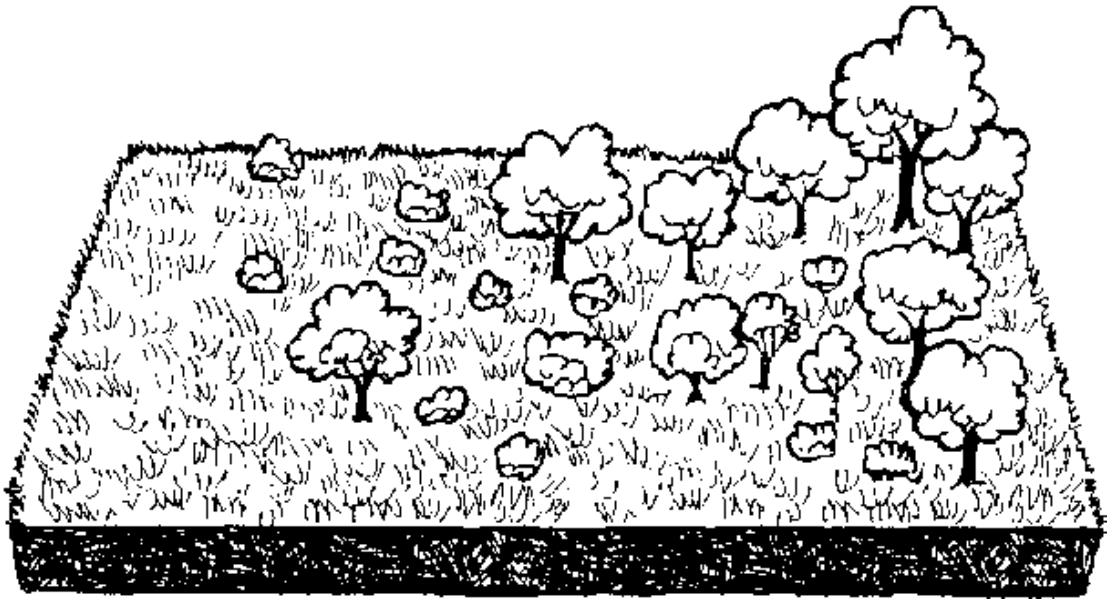
Figure 1

Concept 7

Edges and Contrast

The boundary where two or more types of vegetation or successional stages meet is called “edge.” Sometimes there is an abrupt change where one type of vegetation stops and another begins (see Figure 1), or the change can be less distinct, with a gradual transition from one stage to another (see Figure 2). In places where a gradual change occurs, an edge looks a little like both successional stages or vegetation types. Where abrupt changes occur, the edge is narrow. Edges attract many different wildlife species because the variety of food, cover, and other habitat requirements are arranged close together.

Figure 2



Edges that are produced when extremely different successional stages of vegetation meet are defined as having high contrast. There is high contrast where an area in stage 2 (annual forbs and grasses) meets an area in stage 6 (tall mature trees) of plant succession. A boundary between stages 2 and 3 has low contrast. Edges with low contrast may have more different species of wildlife than edges with high contrast. In general, edge may benefit wildlife species that have low mobility and do not require large areas. However, many landscapes already have sufficient edge. Creation of edge may even be detrimental to some wildlife species, particularly area sensitive species. Edges with low contrast will benefit those wildlife species that need an interspersion of several successional stages.

Concept 8

Area Sensitive Species

Edge is not beneficial for all wildlife. Some wildlife species need large, unbroken (unfragmented) areas in a certain successional stage to provide some or all of their habitat requirements. Such species are referred to as *area sensitive*. For these species, large areas of vegetation in one successional stage are desirable. A forest or rangeland in one successional stage that has at least 100 acres of unbroken (unfragmented) area is considered to be the minimum requirement for many area sensitive species. However, some species may require 1,000 acres or more at a minimum.

Concept 9

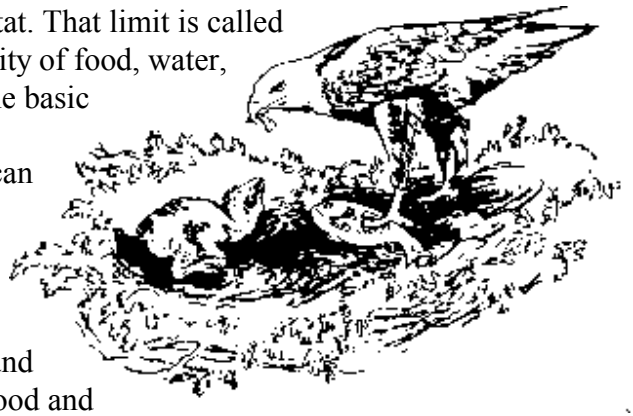
Migration and Home Range

Some wildlife travel during different seasons of the year and times of day. These movements are called "migration." Migration distances may be short or very long depending on the species. This requires that necessary habitats are available along the route. For many species, corridors that provide areas for safe travel are very important during migration. An examples of migration is ducks that nest in the northern United States must fly south to warmer climates to find food sources and wetlands that are not frozen during winter.

Other animals reside in the same area all year. The area of constant use is referred to as an animal's *home range*. For example, in average habitat a northern bobwhite spends most of its life on an area of approximately 80 acres. If the habitat requirements of a species are met in a smaller area (*i.e.,* the habitat is better) in a given locale, then the home range would be smaller.

Concept 10

Carrying Capacity



There is a limit to how many animals can live in a habitat. That limit is called the habitat's "carrying capacity." The quantity and quality of food, water, cover, and space determines the carrying capacity. If one basic requirement is in short supply, the carrying capacity is lowered. By adding the missing ingredient, a manager can increase the habitat's carrying capacity.

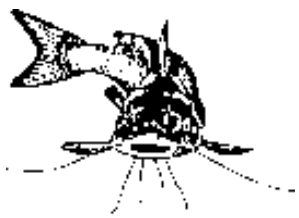
Carrying capacity varies from year to year and from season to season. It is usually greatest from late spring through fall. This is when most young are born and grow. With the coming of winter or summer drought, food and cover gradually diminish, as does the habitat's carrying capacity.

More animals are produced each year than will survive to the next. Surplus animals are generally lost to starvation, disease, and/or predation. Young wildlife and animals in poor health experience the highest death rates. Harvesting of game or fish for human consumption is one way to utilize the surplus. The obvious way to increase the number of animals is to increase the number born and reduce the number that die. However, if the habitat cannot support any more animals, those efforts will fail.

A long-term increase in population can be accomplished only by increasing the habitat's carrying capacity.

Concept 11

Pond Dynamics and Balance



No two ponds are ever exactly alike. Even ponds located side-by-side and in the same watershed can look very different from one another and respond differently to management efforts. These visual differences are usually associated with water quality and algal bloom differences. Management efforts are meant to control water quality, improve fishing, and attract wildlife.

Dissolved oxygen, alkalinity, hardness, and pH are water quality factors that can be managed in ponds. Water quality affects the natural production of food in the pond and the health of the fish.

Oxygen dissolves in water from the atmosphere through the action of wind and waves or is produced by plants in the water in the process of photosynthesis. Oxygen is only slightly soluble in water and its solubility is dependent on water temperature (cooler water holds more dissolved oxygen). Dissolved oxygen is measured in parts per million (ppm). Ponds seldom have more than 10 or 12 ppm dissolved oxygen, even on sunny or windy days. Dissolved oxygen below 4 ppm is stressful to most warmwater fish species (like bass and bluegill), while 6 ppm is stressful to coldwater species (like trout). When dissolved oxygen is below 2 ppm, many species of warmwater fish will die, and below 4 ppm, trout might die. Aquatic plants, particularly planktonic algae (or phytoplankton), produce most of the oxygen dissolved in the pond water during daytime photosynthesis. Therefore, dissolved oxygen concentrations tend to increase throughout the day. At night everything living in the pond (fish, plants, insects, bacteria, etc.) consumes oxygen and the dissolved oxygen concentrations fall. Under normal conditions dissolved oxygen will not fall below 4 ppm overnight.

Alkalinity, hardness, and pH of pond water are related to soil and vegetation in the watershed and the pond. Many soils are acidic and need to be limed to adjust the pH, alkalinity, and hardness upward to a range that will promote the growth of planktonic algae and other natural food organisms. A pond should have a pH that fluctuates between 6.5 and 9, and an alkalinity and hardness of at least 20 ppm. Ponds with low pH, alkalinity, and hardness should be limed based on soil tests of the pond mud. Usual liming rates can range from one to five tons per surface acre.

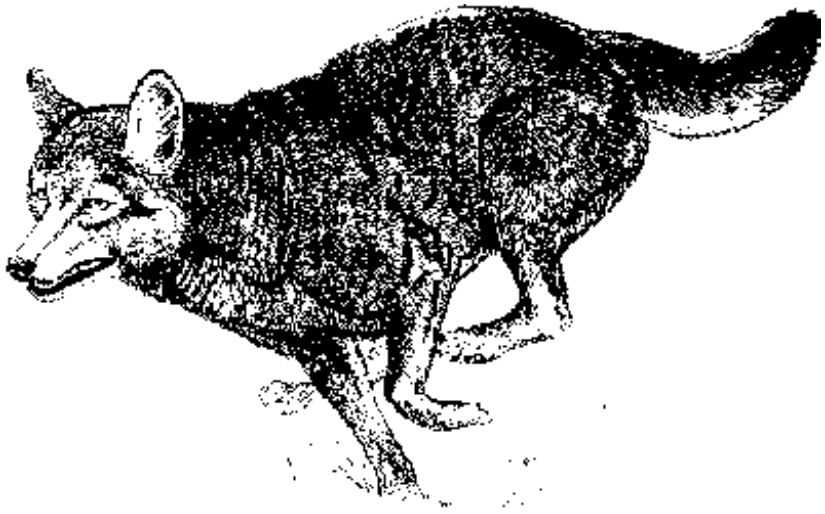
Plankton is the term used for all microscopic and near-microscopic life that floats in water. Plankton is divided into plant (phytoplankton) and animal (zooplankton) groups. Phytoplankton (microscopic algae) are the base of the pond food chain (see Concept 13). Zooplankton and aquatic insects feed on phytoplankton and they in turn are eaten by small fish. Small fish are eaten by larger fish and so on. Managing phytoplankton through fertilizing and liming (if necessary) is the key to producing abundant and healthy fish populations. Suspended mud in ponds blocks sunlight, and algal blooms cannot be established. In this case, muddy pond water must be cleared before a photoplankton bloom can be achieved.

Pond balance occurs when a balance between prey and predator fish is established and maintained. Each state has specific stocking recommendations which are designed to establish balanced pond populations for the first year or two. In most warmwater ponds, the bluegill sunfish is the prey species and the largemouth bass the predator species. In coldwater ponds, the trout is usually the predator species and insects and small fish are the prey. Balance between predator and prey is achieved by establishing an adequate food chain for the prey species and controlling the prey and predator species numbers through fishing. Removal of the predator species is accomplished by selectively harvesting certain sized individuals to maintain a population that has balanced numbers of the various size classes of the predator species. In this way, the prey species is balanced through the selective feeding by the predator species.

Concept 12

Wildlife Damage Management

Wildlife damage management is the art and science of working with habitats, wildlife, and humans to minimize or eliminate damage or danger to people's health or property or other species of wildlife. Wild animals sometimes cause health hazards, or the destruction of crops or other natural resources, or can be nuisance. Wildlife biologists often must catch (trap), release, euthanize (put to death in a humane manner), repel, poison, shoot or frighten individual animals in order to reduce or eliminate problems. Examples of wildlife causing damage are coyotes that prey on sheep or pets, rabid raccoons, bats in the attic, deer eating gardens, skunks under the house, snakes in the house, cormorants eating catfish fingerlings at an aquaculture facility, or starlings roosting in urban trees and defecating on sidewalks, creating a health hazard. Wildlife damage management specialists are professionals who solve such problems.



Concept 13

Food Webs

Plants are primary producers in a food chain because they supply food at the lowest level of a food chain. It takes an enormous number of individual plants to support the other parts of a food web. At the next level of a food chain are primary consumers, that is, plant-eating animals or herbivores. Primary consumers include rabbits, mice, deer, and certain other mammals, some insects and fish, and dabbling ducks, geese, and certain other birds.

Primary consumers are eaten by secondary consumers, or carnivores (meat-eaters). This group includes predators such as birds of prey, snakes, foxes, wild cats, and people. Secondary consumers are eaten by tertiary consumers, which may be predators or scavengers such as turkey vultures, crabs, and sometimes people. Note that these categories are very broad and general. Many animals fit into more than one group, and there are more complex levels of the web.

Any of the food web components mentioned above can be broken down by decomposers, organisms such as bacteria and fungi that reduce dead plant or animal matter into smaller particles. A decaying plant, for example, will be broken down into nutrients that enrich the soil. This process supports the growth of more plants.

Regions

Regions

Areas of the country can be separated into regions having similar climate, vegetation and wildlife. Georgia is part of the *Southeast Mixed and Outer Coastal Plain Forest Region;* therefore, it is the region we will use for our Wildlife Judging Contest. The Wetlands and Urban Regions should be used in any of the regions where they occur.

At the end of each region's description is a list of wildlife species recommended to use while evaluating habitat in that region. You can use any or all of the listed species. Some of the species listed are considered to be a nuisance in some areas and circumstances, but they also have significant roles in habitats.

Specific information on recommended habitat management practices for each species can be found in the *Wildlife Species* section of this manual or in the tables of the Activity A & B section.

Southeastern Mixed and Outer Coastal Plain Forest

Physical Description:

The terrain is rolling hills to mostly flat. Marshes, lakes, and swamps are numerous on the coastal plains. The average annual precipitation ranges from 40 to 60 inches. Precipitation is received throughout the year. Summers are hot and winters are mild.

Dominant Vegetation:

The final successional stage of vegetation usually consists of deciduous trees such as oak, hickory, beech, blackgum, red maple, redbay, southern magnolia, laurel oak, American holly, and winged elm, or occasionally coniferous trees such as loblolly pine. Pines such as loblolly, longleaf, and shortleaf are common on sites where prescribed fire is used and pines likely were the most common trees in the region before the days of fire suppression. Planted loblolly pine is widespread over much of the region. Lower-story trees can include American hornbeam, redbud, shadbush, dogwood, and hawthorns.

Forbs and grasses are common understory plants. Vines such as Virginia creeper, trumpet creeper, grape, greenbriar, and dewberry or shrubs such as sumac, viburnum, haw, and blueberry are also common especially in the third or fourth successional stages.

Gum and cypress trees are dominant on moist areas along the Atlantic Coast and gulf coastal plain.

Farming and Ranching:

Many wetlands along major river courses have been drained and forests cleared to grow crops such as tobacco, cotton, soybeans, corn, and other grain crops. Large areas of forests have also been cleared and planted to grasses and legumes to provide forage for livestock.

Plant Succession Stages:

Stage 1 — bare ground; Stage 2 — annual forbs and grasses; Stage 3 — perennial grasses and forbs; Stage 4 —shrubs; Stage 5 — young woodland; Stage 6 — mature woodland.

Species Recommended for Judging:

American kestrel
Brown thrasher
Coyote
Eastern bluebird
Eastern cottontail
Eastern gray squirrel
Great horned owl
Hairy woodpecker
Mallard
(winter habitat)
Mourning dove
Northern bobwhite
Raccoon
Red- eyed vireo
Wild turkey
White-tailed deer
Wood duck
Largemouth bass
Bluegill

Southeast Mixed and Outer Coastal Plain Forest	American Kestrel	Brown Thrasher	Coyote	Eastern Bluebird	Eastern Cottontail	Eastern Gray Squirrel	Great-horned Owl	Hairy Woodpecker	Mallard (wintering)	Mourning Dove	Northern Bobwhite	Raccoon	Red-eyed Vireo	Wild Turkey	White-tailed Deer	Wood Duck	Largemouth Bass/Bluegill
2. Brush chopping (mowing)	X	X		X	X					X	X	X		X	X		
3. Brush piles					X						X						
5. Controlled (prescribed) burning	X	X		X	X					X	X	X		X	X		
6. Corridors		X				X	X	X				X	X	X	X		
8. Decrease bag/creel/season limit					X	X			X	X	X	X		X	X	X	X
9. Disking										X	X			X			
10. Fertilize ponds																	X
12. Fish (pond) or wildlife survey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14. Grain, leave unharvested						X			X	X	X	X		X	X	X	
16. Increase bag/creel/season limit					X	X			X	X	X	X		X	X	X	X
17. Livestock grazing management	X	X	X	X	X	X	X	X		X	X	X		X	X		X
18. Nesting boxes/structures/platforms	X			X		X	X			X						X	
19. Plant food plots					X					X	X	X		X	X		
20. Plant grass and forbs	X				X		X				X			X	X		
21. Plant mast trees						X								X	X	X	
22. Plant trees or shrubs	X	X		X	X	X		X		X	X	X	X	X	X	X	
23. Ponds/lakes, artificial reefs																	X
24. Ponds, clear muddy water																	X
25. Pond construction									X	X		X				X	X
26. Ponds, diversion ditches																	X
27. Ponds, deepen edges																	X
28. Ponds, remove trees near dike									X	X		X				X	X
29. Ponds, repair spillway									X	X		X				X	X
30. Ponds, reseed watershed/filter strips																	X
31. Ponds, restock																	X
32. Ponds, stop leaks									X	X		X				X	X
33. Riparian buffers									X			X		X		X	
34. Roosting platforms/perching poles							X										
36. Small dikes, for temporary flooding									X							X	
37. Snags, dead, down woody material	X			X			X									X	
41. Tillage, eliminate in fall						X			X	X	X	X		X	X		
42. Timber harvest, clear-cut	X	X	X	X	X		X			X	X	X		X	X		
43. Timber harvest, selective cut		X				X	X				X	X	X	X	X	X	
44. Water control structures									X			X				X	X
45. Water developments for wildlife									X					X			
46. Wildlife damage management			X		X	X	X					X		X	X		

Urban Areas

Physical Description:

Urban landscapes have been broken down into seven categories. At least some of these categories are applicable to nearly all urban areas in the United States.

As with the other regions, vegetation takes on layering characteristics, trees being the highest canopy, shrubs the next highest, and herbaceous forbs and grasses the lowest.

Additional characteristics of urban areas that can be important to wildlife are the height and age of buildings and how vegetation is located around them. The precipitation and climate vary, but irrigation and landscaping produce urban areas with similar habitat.

Categories:

Urban Forests: All of the vegetation and buildings of a city are looked upon as a single unit from the perspective of the animal's habitat requirements and overall management.

Corridors: Contain habitat sufficient to enable wildlife to travel within a yard or among various habitats that may be interspersed within an urban area. Corridors are often adjacent to streams that flow through urban areas and are relatively free from interruption by buildings. A tree-lined street could also be a corridor for many species of wildlife.

Neighborhood Parks, School Grounds, and Golf Courses: Intermediate sized open areas that may already attract wildlife or can be managed to enhance habitat in addition to the primary uses.

Vacant Land: Lots without buildings and designated open space associated with a town or city can provide useful habitat. These can be large or small spaces, with or without alterations by humans.

Residential Areas: Individual homes are areas where animals can be attracted by the habitat provided in a single yard or all the yards combined. The age of a residential area can be of significance to plants and for animals using the area. More established areas tend to have trees, shrubs, and other vegetation that is mature and can offer benefits to wildlife.

Apartment and Business Lots: These areas commonly have balconies and window ledges with outside access and small grounds beneath the large buildings.

Inner City: Characterized by tall buildings with high roof tops, ledges, and little vegetation.

Species Recommended for Judging:

American robin
Bluebirds
Butterflies
Common or lesser nighthawk
Cottontail
Eastern fox squirrel
European starling
Frogs
House finch
House sparrow
House wren
Hummingbirds
Northern flicker
Raccoon
Rock dove (pigeon)
Song sparrow

Urban	American Robin	Bluebirds	Butterflies	Common or Lesser Nighthawk	Cottontails	Eastern Fox Squirrel	European Starling	Frogs	House Finch	House Sparrow	House Wren	Hummingbirds	Northern Flicker	Raccoon	Rock Dove (Pigeon)	Song Sparrow
1. Artificial feeders									X	X		X	X		X	X
3. Brush piles					X											
6. Corridors	X					X		X						X		
18. Nesting boxes/structures/platforms	X	X				X	X			X	X					
19. Plant food plots					X	X								X		
21. Plant mast trees						X										
22. Plant trees or shrubs	X	X	X		X	X	X		X	X	X	X	X	X		X
25. Pond construction								X						X		
33. Riparian buffers								X						X		
44. Water control structures								X						X		
45. Water developments for wildlife	X	X	X			X	X	X	X	X				X	X	X
46. Wildlife damage management					X	X	X	X	X	X			X	X	X	
Additional urban region only practices																
U1. Do not disturb nesting places	X	X		X					X	X	X	X				X
U2. Plant flowers			X									X				
U3. Rooftop/balcony gardens			X									X				
U4. Use pesticides carefully	X	X	X	X			X	X	X	X	X	X	X			X

Wetlands

Physical Description:

Wetlands can be described as the zone between deep water and upland habitats. They are characterized by various amounts of open water, aquatic vegetation, and soil that is often wet or covered with shallow water.

There are many different types of wetlands including beaver ponds, potholes, playas, man-made ponds, small lakes, marshes, rivers, streams, and swamps. They are found in all of the previously mentioned regions.

Dominant Vegetation:

To describe wetland vegetation, the distinction between aquatic vegetation and upland vegetation must be made.

Aquatic Vegetation can survive in the water or on lands, flooded or saturated with water for extended lengths of time.

Upland Vegetation cannot tolerate areas saturated or flooded with water for long periods.

The vegetation found in association with wetlands varies depending on factors such as permanence of the water, depth of water, salinity, and the substrate (bottom).

Wetlands with deep permanent water typically have less emergent aquatic (above the water surface) vegetation and more floating or submerged (below the water surface) aquatic vegetation. As the water depth decreases, emergent aquatic vegetation becomes more dominant.

Less vegetation is found on rock and gravel bottoms than on bottoms that have characteristics more like those of soil such as the presence of silt, clay, and organic (dead plants and animals that are decomposed) matter.

Emergent aquatic vegetation includes trees, shrubs, grass and grasslike plants. Some examples of trees often found in wetlands are willows, cottonwood, oaks, various gum trees, tamarack, cypress, mangroves, red bay, black spruce, Atlantic white cedar, and pond pine.

Shrubs commonly found in and adjacent to wetlands include willows, alders, bog birch, bog laurel, Labrador tea, coastal sweetbells, inkberry, sea myrtle, and marsh elder.

Grass and grass-like vegetation such as cattails, bulrushes, saltgrass, cordgrass, saw grass, sedges, arrow grass, shoal grass, eel grass and wild rice are also examples of emergent aquatic vegetation found in wetlands.

Water lilies, pond weeds, wild celery, water milfoil, duckweeds, and coontails are examples of floating and submerged aquatic vegetation.

The amount of open water and vegetation is important in determining how suitable the wetland is for different wildlife species. For instance, young ducks need open water and emergent vegetation for hiding. Floating and submerged vegetation supports large amounts of food high in protein such as snails, mollusks, and crustaceans that the young ducks need for fast growth.

Emergent vegetation may supply nesting areas such as trees for wood ducks, grass for mallards, and cattails for red-winged black birds and muskrats.

Wetlands that have stable, non-flowing water levels go through successional stages of vegetation development similar to those found on adjacent upland areas. The open water areas fill in with silt and dead vegetation allowing emergent aquatic vegetation to become dominant. As the wetland continues to fill in, it becomes drier, allowing upland vegetation to become dominant.

Wetlands	Beaver	Bullfrog	Canada Goose (breeding)	Mallard (breeding)	Mink	Muskrat	Raccoon	Redhead Duck	Red-winged Blackbird***	Wood Duck	Largemouth Bass/Bluegill
2. Brush chopping (mowing)			X	X	X	X	X	X	X		
5. Controlled (prescribed) burning			X	X	X	X	X	X	X		
8. Decrease bag/creel/season limit	X	X			X	X	X	X		X	X
12. Fish (pond) or wildlife survey	X	X	X	X	X	X	X	X	X	X	X
15. Harvest timing (crops/hay)				X							
16. Increase bag/creel/season limit	X	X			X	X	X	X		X	X
17. Livestock grazing management	X	X	X	X	X	X	X	X	X		X
18. Nesting boxes/structures/platforms			X	X						X	
20. Plant grass and forbs			X	X							
21. Plant mast trees										X	
22. Plant trees or shrubs	X						X		X	X	
25. Pond construction		X	X	X	X	X	X	X	X	X	X
28. Ponds, remove trees near dike		X	X	X	X	X	X	X	X	X	X
29. Ponds, repair spillway		X	X	X	X	X	X	X	X	X	X
30. Ponds, reseed watershed/filter strips											X
31. Ponds, restock											X
32. Ponds, stop leaks		X	X	X	X	X	X	X	X	X	X
33. Riparian buffers	X	X	X	X	X	X	X	X	X	X	X
36. Small dikes, for temporary flooding			X	X	X	X	X	X	X	X	
43. Timber harvest, selective cut							X			X	
44. Water control structures		X	X	X	X	X	X	X	X	X	
46. Wildlife damage management	X		X			X	X		X		

*** This species is often a pest in agricultural areas and forests. 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 areas where agricultural crops are not commonly grown.

Stage 1 – Wetland

Stage 2 – Wetland

Stage 3 – Wetland

Stage 4 – Wetland

Wetland Plant Succession Stages:

Typically succession would proceed in the following order:

Stage 1 — deep water with little vegetation
Stage 2 —shallow water dominated by submerged and floating aquatic vegetation
Stage 3 — very shallow water or wet ground dominated by any variety of emergent aquatic vegetation
Stage 4 — ground becomes drier and upland vegetation similar to the surrounding area becomes dominant.

This type of succession proceeds slowly in wetlands with large amounts of deep water or a rocky bottom. Fluctuations in water level can cause final stages of this succession to regress to earlier stages. For instance, if a wetland in stage 3 of succession is flooded with deep water for a period of time, the aquatic emergent vegetation may die leaving a wetland in stage 1 or 2 of succession.

The extent of this regression depends on the length of time the wetland is flooded with deep water, how much the water level changes, and the extent (length of time) that the present vegetation can survive in the changed water level.

Management of water levels is an important tool in managing wetlands for wildlife habitat. The succession process described above is often not applicable to wetlands with constantly moving water such as rivers, streams, and tidal areas.

Species Recommended for Judging:

Beaver
Bullfrog
Canada goose (breeding habitat)
Mallard (breeding habitat)
Mink
Muskrat
Raccoon
Redhead Duck
Red-winged blackbird
Wood duck
Largemouth Bass/Bluegill

Wildlife Species

Wildlife Species

This section discusses habitat requirements and practices useful for managing habitat for the birds, mammals, and other species listed in the *Southeast Mixed and Outer Coastal Plain Forest, Urban and Wetland* sections. You should now begin to learn about their needs and the appropriate management techniques.

Wildlife managers must decide which practices are appropriate for their specific area. **However, the practice of increasing or decreasing bag/creel limits to meet population objectives applies to all game, furbearer, and fish species but does not always appear in the narrative for each species. Likewise, the practice of making fish or wildlife surveys is not always listed in the narrative, but monitoring populations of game or non-game is always important in wildlife management.**

Reading additional materials and experience in the field are recommended for making good habitat management decisions. Learning the information in this section for the appropriate species in our region is a good place to start. Published field guides to North American birds and mammals are good sources for seeing what the species look like and learning more about them.

Management Recommendations by Species

The management recommendations at the end of the each species description are tied to the following criteria for each Region occurring in Georgia.

Southeast Mixed and Outer Coastal Plain Forest – Plant Succession Stages

I Bare ground
II Annual forbes and/or grasses
III Perennial forbes and grasses
IV Shrubs
V Young woodlands or trees (less than 70 years old)
VI Mature Woodland or trees

Urban – Mark all practices recommended unless situation already exists
Practices U1 – U4 are always marked when recommended

Wetland – Plant Succession Stages for Wetlands

I Deep water with little vegetation
II Shallow water dominated by submerged and floating aquatic vegetation
III Very shallow water or wet ground dominated by any emergent aquatic vegetation
IV Ground becomes drier and upland vegetation similar to the surrounding area becomes dominant

" * " indicates a practice where: *1. information pertaining to habitat or species condition must be provided or 2. observation of conditions is needed . If information is not provided or cannot be discerned, then the practice should not be recommended or marked on a contestant's card.*

Index to Wildlife Species

Birds

Mammals

Other Species

Birds

American Kestrel

General Habitat Preference:

Stages 2 and 3 of plant succession for feeding, and stages 4, 5, and 6 for nesting. Large open areas where adequate nesting sites are available.

Habitat Requirements:

Food: Primarily insects and small mammals associated with open areas.

- Brush chop, chain, or roller beat small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 4 (shrub) vegetation. Control burn small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 4 (shrub) vegetation.
- Clear-cut small areas in large expanses of stage 5 and 6 woodlands.
- Livestock grazing management should leave enough herbaceous canopy to support insects and small rodents.
- Plant grasses and forbs to provide habitat for rodent prey.

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

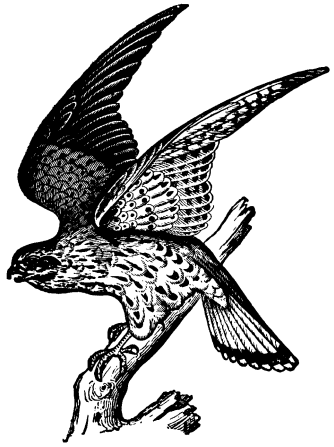
- **Maintain** areas of stage 5 and 6 vegetation interspersed with stage 2 and 3 vegetation.
- Plant trees in large open areas (irrigate if necessary) on idle lands.
- Provide kestrel nesting boxes in areas lacking adequate nesting cavities. Boxes can be placed on fence posts in open areas.
- Manage livestock grazing to maintain trees in riparian areas.

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

AMERICAN KESTREL

Possible Habitat Management Practices:
2. Brush chopping. 5. Controlled burning, 12. Wildlife survey, 17. Livestock grazing management, 18. Nesting boxes/structures/platforms, 20. Plant grass and forbes, 22. Plant trees or shrubs, 37. Snags, dead & down woody material, 42. Timber harvest, clear cut

Practices Recommended for Plant Succession Stages:
I - 12, 17*, 18, 20, 22, 37
II & III - 2, 5, 12, 17*, 18, 22, 37
IV - 2, 5, 12, 17*, 18, 20, 22, 37
V - 2, 5, 12, 17*, 18, 20, 22, 37, 42
VI - 2, 5, 12, 17*, 20, 22, 37, 42



American Robin

General Habitat Preference:

Urban settings with large open areas and nearby trees and shrubs. Parks, golf courses, and lawns in residential areas are favorites.

Habitat Requirements:

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

- Plant fruit- and berry-producing shrubs such as sumac, Nanking cherry, golden currant, and Russian olive.
- Leave open areas of short grass and forbs.
- Use insecticides only when necessary. When using insecticides, carefully follow the instructions given on the label.

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

- Plant and maintain trees and shrubs. Include some evergreen trees in plantings.
- Provide nesting platforms in areas lacking nest sites.
- Corridors provide important travelways connecting habitats.

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

- Birdbaths and pans of water can be provided. Do not place water in areas where cats and other pets can catch the birds.

<u>AMERICAN ROBIN (Urban)</u>

Possible Habitat Management Practices:
6. Corridors, 18. Nesting boxes/structures/platforms, 22. Plant trees or shrubs, 45. Water developments for wildlife, U1. Do not disturb nesting places, U4. Use pesticides carefully

Brown Thrasher

General Habitat Preference:

Stages 3 and 4 of plant succession. Dense, woody vegetation associated with shrub thickets, hedgerows, shelterbelts, forest edges, riparian areas, and young forests.

Habitat Requirements:

Food: Invertebrates and plant seeds are the principal foods. These birds forage primarily on the ground and occasionally feed on fruits and berries in shrubs and trees. More food is available when there is more ground litter. The management practices listed under "Cover" will usually supply sufficient food.

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

- Selective-cut forests in large expanses of stage 5 or 6 woodland.
- Clear-cut timber harvest can improve habitat once succession proceeds to stage 4 after harvest.
- Plant shrubs and trees (shelterbelts, hedgerows, field borders, clumps).
- Create corridors of stage 4.
- Brush chopping, chaining, roller beating and controlled (prescribed) burning can be used to rejuvenate and improve habitat in large areas of old decadent stage 4 vegetation or to keep areas in stage 4.
- Manage livestock grazing in riparian areas and other woody areas so shrubs and trees can regenerate and ground litter is present.
- Manage livestock grazing to prevent succession moving back to stage 2 or 1.

Water: Requirements unknown.

<u>BROWN THRASHER</u>

Possible Habitat Management Practices:
2. Brush chopping, 5. Controlling burning, 6. Corridors, 12. Wildlife survey, 17. Livestock
grazing management, 22. Plant trees or shrubs, 42. Timber harvest, clear cut, 43. Timber harvest,
selective cut

Practices Recommended for Plant Succession Stages:
I - 6, 12, 17*, 22
II, III & IV- 2, 5, 6, 12, 17*, 22
V & VI - 2, 5, 6, 12, 17*, 22, 42*, 43*

Canada Goose
(Breeding Habitat)

General Habitat Preference:

Canada goose 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.

In some areas, Canada geese have become a problem, causing damage to lawns, golf courses, and in winter wheat fields. Wildlife damage management may be necessary.

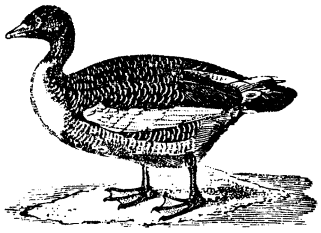
Habitat Requirements:

Food: During the nesting season and summer Canada goose prefer new green forbs and grasses. They also eat some aquatic insects and pond weeds. Plant grasses and forbs.

- Livestock grazing management or burning can be used to produce the preferred lush green vegetation.
- Burn or brush chop small areas (40 acres maximum, 10 to 20 acres preferred) every three to five years.
- **Cover:** Nest in a variety of places such as mats of bulrushes, tops of muskrat houses, in trees, and most of all, on islands. Use artificial nest structures. Usually nest within 200 feet of water's edge.
- Construct ponds and wetlands.
- When possible, use water control structures for managing water levels to maintain approximately 80 percent open water and 20 percent emergent vegetation.
- Provide artificial nest structures, preferably on islands and/or peninsulas surrounded by open water.

Water: Water is required as described above.

<u>CANADA GOOSE (Wetlands)</u>



Possible Habitat Management Practices:
2. Brush chopping, 5. Controlled burning, 12. Wildlife survey, 17. Livestock grazing management, 18. Nesting boxes/structures/platforms, 20. Plant grass and forbes, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 44. Water control structures, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I - 12, 18, 20, 33, 44, 46*
II - 12, 17*, 18, 20, 25, 28*, 29*, 32*, 33, 36, 44, 46*
III & IV- 2, 5, 12, 17*, 18, 20, 25, 28*, 29*, 32*, 33, 36, 44, 46*

Common Nighthawk
Lesser Nighthawk

General Habitat Preference:

Stage 1, bare ground for nesting. Stages 2 and 3 of plant succession interspersed with areas in stages 4 and 5 of plant succession. Areas such as 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.

Habitat Requirements:

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

- Use insecticides only when necessary. Carefully follow the directions on the label.

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.

- Do not disturb nests during nesting season (May through June). Stay off roof tops that are used for nesting.

Water: Nighthawks do not drink water often. They obtain ample water from their diet.

<u>COMMON OR LESSER NIGHTHAWK (Urban)</u>

Possible Habitat Management Practices:
U1. Do not disturb nesting places, U4. Use pesticides carefully

Eastern Bluebird

General Habitat Preference:

Stages 2 and 3 of plant succession interspersed with stages 5 and 6 vegetation.

Habitat Requirements:

Food: Insects and spiders make up a large portion of the diet. A limited amount of fruit is also eaten. Bluebirds usually forage in open areas.

- Clear-cut small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 5 and 6 woodland.
- Brush chop, chain, or roller beat, small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 4 vegetation.
- In areas dominated by mesquite, root plowing combined with the seeding of grasses and legumes may be the best way to maintain areas in stage 3 vegetation.
- Control burn small areas in large expanses of stage 4 and 5 vegetation.

Cover: Nesting sites are in natural cavities and old woodpecker holes.

- Leave 3 to 4 standing dead or nearly dead large trees per acre during timber harvest operations.
- Place nest boxes 4 to 5 feet high in or adjacent to open areas. Boxes should be spaced more than 200 feet apart.
- If there is no tree cover, plant trees where they may have been historically protected from fire.
- Manage livestock grazing to protect young trees.

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

Special: House Sparrows and European Starlings often take over bluebird nest boxes. Control of these species may be necessary.

- Use pesticides carefully in urban areas.

<u>EASTERN BLUEBIRD</u>

Possible Habitat Management Practices:
2. Brush chopping, 5. Controlled burning, 12. Wildlife survey, 17. Livestock grazing management, 18. Nesting boxes/structures/platforms, 22. Plant trees or shrubs, 37. Snags, dead, down woody material, 42. Timber harvest, clear-cut

Practices Recommended for Plant Succession Stages:
I - 12, 17*, 18, 22, 37
II, III & IV - 2, 5, 12, 17*, 18, 22, 37
V - 2, 5, 12, 17*, 18, 22, 37, 42
VI - 2, 5, 12, 17*, 22, 37, 42

European Starling

General Habitat Preference:

European starlings prefer older urban residential areas with large trees and shrubs. Most urban areas that have large trees or old buildings with holes and cavities are used.

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. However, in the inner cities, where there are few wildlife species, management may include providing for the only wildlife that exists.

Habitat Requirements:

Food: Insects, fruit, seeds, human garbage, even dog and cat food. Starlings usually do not use artificial feeders. However, starlings can be attracted to an area by spreading bread crumbs and small grains on the ground in yards, etc.

Cover: They nest in cavities in trees, old buildings, and old houses. Will use artificial nest boxes.

- Provide nest boxes where adequate nest sites are lacking.
- Plant and maintain deciduous trees.

Water: They require water during warm seasons.

- Birdbaths, pans of water, or puddles of water can attract starlings.

<u>EUROPEAN STARLING (Urban)</u>

Possible Habitat Management Practices:

18. Nesting boxes/structures/platforms, 22. Plant trees or shrubs, 45. Water development for wildlife, 46. Wildlife damage management, U4. Use pesticides carefully.

Great Horned Owl

General Habitat Preference:

The great horned owl occurs in a wide variety of forested habitats, mainly open woodlands of stages 5 and 6 of succession, interspearsed with areas of stages 2, 3, and 4, including orchards, farm woodlots, and city parks. It is occasionally found in rocky canyons away from forest cover.

Habitat Requirements:

Food: The great horned owl prefers open areas near woodlands, such as marshes or meadows, for hunting. It consumes an extremely varied diet; but prefers small- to medium-sized mammals and birds. It also preys upon reptiles, amphibians, large insects, and fish; it rarely consumes carrion.

Cover: Abandoned nests of hawks, herons, or crows, large tree cavities, crotches, stumps, caves and ledges.

- Leave snags and cavity trees for nesting/perching when clearcutting or harvesting with a group selection system.
- Roosting/perching poles or platforms may be constructed where no large trees, caves, or ledges exist.
- Nesting boxes or platforms may be established where nest sites are limited.
- Plant grasses and forbs for rodent prey.
- Use timber harvest, either selective cut or small clear-cuts to create openings in broad expanses of stage 5 and 6.
- Livestock grazing management may be necessary to leave adequate grass and forb cover for small mammal prey.

Water: These birds obtain necessary water from their diet.

Special: In a few areas this species can cause damage to free ranging poultry and wildlife damage management may be needed.

<u>GREAT-HORNED OWL</u>

Possible Habitat Management Practices:
6. Corridors, 12. Wildlife survey, 17. Livestock grazing management, 18. Nesting boxes/structures/platforms, 20. Plant grass and forbes, 34. Roosting platforms/perching poles, 37. Snags, dead, down woody materials, 42. Timber harvest, clear cut, 43. Timber harvest, selective cut, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I - 6, 12, 17*, 18, 20, 34, 37, 46*
II & III - 6, 12, 17*, 18, 34, 37, 46*
IV - 6, 12, 17*, 18, 20, 34, 37, 46*
V & VI - 6, 12, 17*, 18*, 20, 37, 42*, 43*, 46*

Hairy Woodpecker

General Habitat Preference:

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

Habitat Requirements:

Food: Majority of food is animal matter 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 limiting.

Cover: Holes are excavated in mature and dying trees and snags for nesting. Maintain areas with large mature and dying trees, especially in open areas. Within wooded areas maintain at least one large snag per acre.

- Plant softwood trees.
- Manage livestock grazing in riparian areas to maintain trees. Grazing when woody vegetation is not growing fast (fall and winter) usually does less damage to woody vegetation than at other times of the year.
- Develop corridors to connect isolated woodlands in urban and other areas.
- Retain or develop snags.

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

HAIRY WOODPECKER

Possible Habitat Management Practices:
6. Corridors, 12 Wildlife survey, 17 Livestock grazing management, 22. Plant trees or shrubs

Practices Recommended for Plant Succession Stages:
I - VI - 6, 12, 17*, 22

House Finch

General Habitat Preference:

Found in a wide variety of urban areas that have trees, shrubs, and some open areas. Not as abundant in inner cities.

Habitat Requirements:

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

- They use artificial feeders of all types. Millet and sunflower seeds are favorites.

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.

- Plant shrubs adjacent to open areas for nesting and hiding cover.
- Do not disturb nests found on houses and buildings unless they are causing a problem such as plugging a rain gutter.

Water: They require water daily in warm seasons.

- 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 FINCH (Urban)

Possible Habitat Management Practices:

1. Artificial feeders, 22. Plant trees or shrubs, 45. Water developments for wildlife, 46. Wildlife damage management, U1. Do not disturb nesting places, U4. Use pesticides carefully.

House Sparrow

General Habitat Preference:

This introduced species is found in a wide variety of urban categories that have buildings, trees, shrubs and some open areas.

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:

Food: House sparrows eat a variety of insects, fruits, buds, and weed seeds.

- They will use artificial feeders of all types. Millet and sunflower seeds are favorites.

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.

- Plant shrubs adjacent to open areas for nesting and hiding cover.
- Do not disturb nests found on houses and buildings unless they are causing a problem such as plugging a rain gutter.

Water: House sparrows require water daily in warm seasons.

- 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 (Urban)

Possible Habitat Management Practices:

1. Artificial feeders, 18. Nesting boxes/structures/platforms, 22. Plant trees or shrubs, 45. Water developments for wildlife, 46. Wildlife damage management, U1. Do not disturb nesting places, U4. Use pesticides carefully.

House Wren

General Habitat Preference:

In urban setting, house wrens prefer older residential areas with large shrubs and trees.

Habitat Requirements:

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

- Plant and maintain shrubs and trees.
- Use insecticides only when necessary. Carefully follow instructions on the label.

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

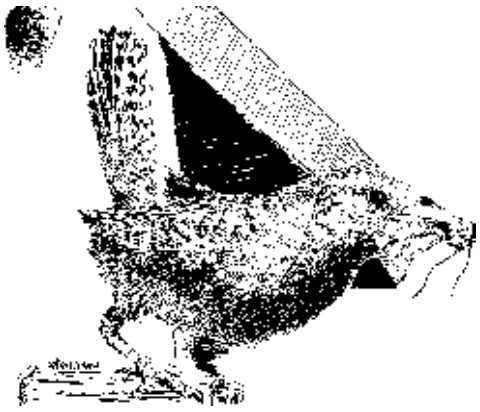
- Plant and maintain shrubs and trees.
- Provide nest boxes where adequate nesting sites are lacking. Boxes should be placed high on a tree trunk or under the eaves of a house. The hole should be small to keep out house sparrows, starlings, and other birds.
- Do not disturb nests found on houses and buildings unless they are causing a problem.

For specifics on nest box design and placement, visit your local Cooperative Extension office.

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

HOUSE WREN (Urban)

Possible Habitat Management Practices:
18. Nesting boxes/structures/platforms, 22. Plant trees or shrubs, U1. Do not disturb nesting places, U4. Use pesticides carefully.



Hummingbird

General Habitat Preference:

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.

Habitat Requirements:

Food: 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.

- 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 flowering shrubs and trees. Favorites are honeysuckle, mesquite, lilac, flowering dogwood, and various fruit trees.

Hummingbirds use artificial feeders filled with sugar-water (1 part sugar to 4 parts boiled water). 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 Service office.

- Use insecticides only when necessary. Carefully follow instructions on the label.

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.

- Plant and maintain trees. Trees with rough bark are preferred.
- Do not disturb nests found on houses and buildings unless they are causing a problem such as plugging a rain gutter.

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

<u>HUMMINGBIRDS (Urban)</u>

Possible Habitat Management Practices:
1. Artificial feeders, 22. Plant trees or shrubs, U1. Do not disturb nesting places, U2. Plant flowers, U3. Rooftop/balcony gardens, U4. Use pesticides carefully.

Mallard (Breeding Habitat)

General Habitat Preference:

Mallards 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:

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

- In areas without wetlands, build ponds and reservoirs with gently sloping banks or re-establish old wetlands.
- Construct small dikes to provide temporary open water areas mixed with aquatic emergent vegetation through the breeding season.
- Provide some shallow water areas (less than 2 feet deep) adjacent to deep water where emergent and submergent vegetation can grow. Use water control structures.
- Unharvested grain and grain stubble that has not been tilled can provide high energy food needed by nesting hens.

Cover: Mallards nest in grass and forb vegetation (sometimes they nest under shrubs) preferably within 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 percent to 20 percent emergent vegetation.

- Cover can be created with practices described under "Food."
- Water developments constructed for wildlife and livestock drinking such as dugouts and catchment ponds are often used to raise broods.
- Control water levels to create some deep water areas (more than two feet deep) where emergent vegetation won't grow, and manage the vegetation in wetlands (stage 2). Water control structures are useful for this purpose.
- Control (prescribe) burn, brush chop, or use livestock grazing 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.
- Nesting structures are occasionally used by mallards.
- Plant grass and forb (legumes) vegetation within ½ mile of wetlands that meet the above criteria.
- Livestock grazing should be managed to provide areas with tall, healthy, herbaceous vegetation that are not disturbed during the nesting season.
- Delay mowing. Harvest hay and crops adjacent to wetlands after nesting season.
- Riparian buffers may be needed where cover is limited in some regions.

Water: Mallards require and use water as previously described.

<u>MALLARDS – Breeding (Wetlands)</u>

Possible Habitat Management Practices:

2. Brush chopping, 5. Controlled burning, 12. Wildlife survey, 15. Harvest timing (crop /hay),

17. Livestock grazing management, 18. Nesting boxes/structures/platforms, 20. Plant grass and forbs, 25. Pond construction, 28. Ponds, Remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 44. Water control structures

Practices Recommended for Plant Succession Stages:
I - 12, 18, 33, 36*, 44*
II - 12, 17*,18, 25, 28*, 29*, 32*, 33, 36, 44
III & IV - 2, 5, 12, 15, 17*, 18, 20, 25, 28*, 29*, 32*, 33, 36, 44*

Mallard (Winter Habitat)

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

General Habitat Preference:

Wetlands with open water, harvested grain crops, and riparian areas with open water.

Habitat Requirements:

Food: 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 cover the more valuable it is.

- Provide waste grain in winter by not tilling grain fields in the fall.
- Leave some grain unharvested.
- Use small dikes to flood grain fields, planted food plots, and oak woodlands in winter.
- Build ponds and reservoirs with some shallow water (less than two feet deep) where aquatic vegetation can grow.
- Planting food plots is beneficial if adequate moisture is available in the Hot Desert Region.

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.

- Build ponds, reservoirs, and warm-water sloughs.
- Water developments constructed for livestock drinking such as dugouts and catchment ponds are also used for resting.
- Livestock should be managed so that some cover is retained in shallow areas.

Keep human disturbance to a minimum.

Water: Mallards use water as described above.

<u>MALLARDS – Wintering</u>

Possible Habitat Management Practices:
8. Decrease bag/season limit, 12. Wildlife survey, 14. Grain, leave unharvested,
16. Increase bag/ season limit, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 41. Tillage, eliminate in fall, 44. Water control structures, 45. Water development for wildlife

Practices Recommended for Plant Succession Stages:
I - VI - 8*, 12, 14, 16*, 25, 28*, 29*, 32, 33, 36, 41, 44*, 45

Mourning Dove

General Habitat Preference:

Stages 2 and 3 of plant succession with some shrubs and trees nearby. Mourning doves often use agriculture areas for feeding. Small areas of bare ground are also beneficial.

Habitat Requirements:

Food: Waste grain from cropland and livestock feed lots and a variety of grass and forb seeds.

- Do not till in fall after harvest of small grain crops. Leave waste grain available.
- Disk areas to provide bare ground.
- Leave some areas of small grains (wheat, barley, millet, milo, or oats) unharvested.
- Plant annual food plots in areas lacking grain.
- Brush chop, chain, or roller beat small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 4 vegetation.
- Clear-cut small areas (40 acres maximum, 10 to 20 acres preferred) in large areas of stage 5 and 6 woodland.
- Control burn small areas (40 acres maximum, 10 to 20 acres preferred) in large areas of stage 4 and 5 of plant succession.
- Livestock grazing can be used to keep some areas in stage 2 and 3 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.

- Plant shrubs and trees 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.
- Mourning doves often construct loose, flimsy nests. High winds and rainstorms often destroy many of them. To provide secure nesting sites, wire cone nesting structures can be placed where tree limbs fork 6 to 15 feet above the ground. This practice is most useful in regions where high winds and large open areas are common.

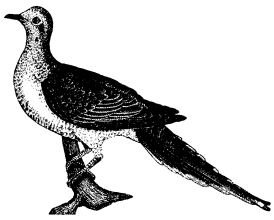
Water: Mourning doves require water daily. They prefer shorelines and banks without vegetation.

- Where water is limited or absent, development of water sources is desirable: Catchment ponds Guzzlers, Windmills, Spring development

<u>MORNING DOVES</u>

Possible Habitat Management Practices:

2. Brush Chopping, 5, Controlled burning, 8. Decrease bag/season limit, 9. Disking, 12. Wildlife survey, 14. Grain, leave unharvested, 16. Increase bag/season limit, 17. Livestock grazing management, 18. Nesting boxes/structures/platforms, 19. Plant food plots, 22. Plant trees or shrubs, 25, Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 41. Tillage, eliminate in fall, 42. Timber harvest, clear-cut



Practices Recommended for Plant Succession Stages:

I - 8*, 12, 14, 16*, 17*, 18, 19, 22, 25, 28*, 29*, 32*, 41
II, III & IV - 2, 5, 8*, 9, 12, 14, 16*, 17*, 18, 19, 22, 25, 28*, 29*, 32*, 41
V & VI - 2, 5, 8*, 9, 12, 14, 16*, 17*, 18, 19, 22, 25, 28*, 29*, 32*, 41, 42

Northern Bobwhite

General Habitat Preference:

Stages 2, 3, and 4 of plant succession interspersed. Ideally, habitat components are made up of ¼ grassland, ½ cropland, ⅛ shrub cover, and ⅛ woodland.

Habitat Requirements:

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

- Plant ⅛ to ¼ acre annual food plots in areas with too little cropland, one plot per 15 acres maximum.
- Leave some grain unharvested.
- Eliminate fall tillage.
- Plant ⅛ to ¼ acre perennial food plots in areas with too little permanent food and cover, again, one plot per 15 acres maximum.
- Clear-cut small areas (small 40-acre patches or strips) in large expanses of stage 5 and 6 woodland.
- Selective-cut stage 6 woodlands.
- Brush chop, chain, root plow, or roller beat small areas (40 acres or less) in large expanses of stage 4 vegetation.
- Control (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.
- Time haying to protect nesting areas.
- Disk small areas in large expanses of stage 3 and 4 to encourage annual forbs and grasses used by bobwhite.
- 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.

Cover: Thick shrubs for hiding and roosting cover.

- Plant grasses and forbs.
- Plant shrubs in areas where cover is scarce.
- Construct brush piles.
- Manage livestock grazing to maintain dense shrub and herbaceous cover. Again, this is important in riparian areas.

Water: Bobwhite do not require free-standing water, but in arid regions water development is beneficial.

- In regions where available water is limited or absent, development of water sources is desirable. Examples are ponds, dugouts, guzzlers, windmills, and spring developments.

<u>NORTHERN BOBWHITE</u>

Possible Habitat Management Practices:

2. Brush chopping, 3. Brush piles, 5. Controlled burning, 8. Decrease bag/season limit, 9. Disking, 12. Wildlife survey, 14. Grain, leave unharvested, 16. Increase bag/season limit, 17. Livestock grazing management, 19. Plant food plots, 20, Plant grass and forbs, 22. Plant trees or shrubs, 41. Tillage, eliminate in fall, 42, Timber harvest, clear-cut, 43. Timber harvest, selective cut

Practices Recommended for Plant Succession Stages:

I - 3, 8*, 12, 14, 16*, 17*, 19, 20, 22, 41
II & III - 2, 3, 5, 8*, 9, 12, 14, 16*, 17*, 19, 22, 41
IV - 2, 3, 5, 8*, 9, 12, 14, 16*, 17*, 19, 20, 22, 41
V & VI - 2, 3, 5, 8*, 9, 12, 14, 16*, 17*, 19, 20, 22, 41, 42*, 43*

Northern Flicker

General Habitat Preference:

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 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:

Food: Ants are a favorite and over 50 percent of the diet is insects. They also eat seeds, fruits, and berries and are partial to the fruit of poison ivy. They usually feed in open areas.

- 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.
- Mow herbaceous vegetation to keep relatively short in height for foraging.
- Artificial feeders are used in urban areas. They prefer suet feeders fastened to tree trunks.
- Use pesticides with caution in urban areas.

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.

- Maintain some large mature and standing dead trees (snags) when harvesting timber.
- In large expanses without trees, plant softwood trees.
- Manage livestock grazing, so that herbaceous vegetation is kept at medium to short heights.

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

Special: *European starlings often take over flicker cavities for their own nests.*

NORTHERN FLICKER (Urban)

Possible Habitat Management Practices:
1. Artificial feeder, 22. Plant trees or shrubs,
46. Wildlife damage management, U4. Use pesticides carefully.

Species II

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:

Food: 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.

- Selective-cut forest management in large expanses of stage 6 woodland can increase the amount of insects.

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 5 to 10 feet above the ground, but sometimes as high as 60 feet.

- Livestock grazing has little or no effect on this species.
- Selective-cut forest management in large expanses of stage 6 woodland could increase cover used by this species.
- Plant trees and shrubs in large areas of stages 3 and 4 of plant succession.

Water: They obtain necessary water from diet.

RED-EYED VIREO

Possible Habitat Management Practices:
6. Corridors, 12. Wildlife survey, 22. Plant trees or shrubs, 43. Timber harvest, selective cut

Practices Recommended for Plant Succession Stages:
I, II, III & IV - 6, 12, 22
V & VI - 6, 12, 22, 43

Redhead Duck

General Habitat Preference:

Stage 2 wetlands for most activities. Redhead ducks usually nest in emergent aquatic vegetation associated with stage 3 wetlands that are adjacent to stage 2 wetlands.

Habitat Requirements:

Food: Especially young 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.

- Control water level with water control structures 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 3 to 5 feet).
- Build ponds/wetlands with a minimum size of one surface acre of water, and manage water levels to provide habitat similar to that described above.
- Construct small dikes to temporarily flood areas dominated by tall emergent aquatic vegetation during the nesting season.

Cover: Build nests out of emergent vegetation. Nests are usually placed above water or very near the shore in dense vegetation that provides concealment.

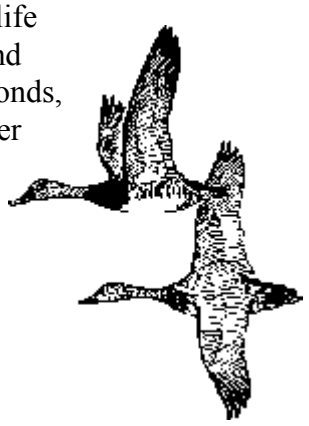
- Control water levels to promote growth of tall emergent aquatic vegetation. Strive for wetlands comprised of 50 percent stage 3 interspersed with 50 percent stage 2 wetland.
- Manage livestock grazing to maintain tall emergent aquatic vegetation adjacent to the water. Prolonged protection of nesting 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 ⅓ to ½ of the nesting area should be treated during any one year.
- Controlled (prescribed) burning every 3 to 5 years and brush chopping or mowing can be used to rejuvenate deteriorated vegetation (see livestock grazing).

Water: Redhead ducks require water as described above.

<u>REDHEAD DUCK (Wetland)</u>

Possible Habitat Management Practices:

2. Brush chopping, 5. Controlled burning, 8. Decrease bag/season limit, 12. Wildlife survey, 16. Increase bag/limit season, 17. Livestock grazing management, 25. Pond construction, 28. Pond, remove trees near dike, 29. Ponds, repair spillways, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 44. Water control structures



Practices Recommended for Plant Succession Stages:

I - 8*, 12, 16*, 33, 44
II & III - 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 36, 44
IV - 2, 5, 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 36, 44

Red-winged Blackbird (Breeding Habitat)

General Habitat Preference:

Stage 3 wetlands dominated by emergent aquatic vegetation.

This species can be 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.

Habitat Requirements:

Food: 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.

- Control water levels with water control structures and small dikes to provide shallow water where emergent vegetation can grow.
- Construct ponds and wetlands with shallow water (less than 2 feet deep) where tall emergent aquatic vegetation can grow.
- Livestock grazing adjacent to and/or in wetlands should be managed to maintain cattails, shrubs, and trees.
- Controlled (prescribed) burning and brush chopping every three to five years can be used to rejuvenate old, decadent emergent aquatic vegetation.

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.

- The practices listed under food could also be used to manage cover.
- Plant trees and shrubs adjacent to wetlands and ponds (not on the dike or dam).

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

<u>RED-WINGED BLACKBIRDS (Wetland)</u>

Possible Habitat Management Practices:
2. Brush chopping, 5. Controlled burning, 12. Wildlife survey, 17. Livestock grazing management, 22. Plan trees or shrubs, 25. Pond construction, 28. Pond, remove trees near dike, 29. Ponds, repair spillways, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 44. Water control structures, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I - 12, 22, 33, 36, 44, 46
II - 12, 17*, 22, 25, 28*, 29*, 32*,33, 36, 44, 46
III & IV - 2, 3, 12, 17*, 22, 25, 28*, 29*, 32*, 33, 36, 44, 46

Rock Dove (Pigeon)

General Habitat Preference:

In urban areas large buildings and nearby parks and open areas are preferred.

In some areas rock doves become so numerous that they are considered pests. In such situations the management objectives may be to reduce the quality and quantity of available habitat or reduce damage. However, in the inner cities where there are few wildlife species, management may include providing for the only wildlife that exists.

Habitat Requirements:

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

- For artificial feeding, small grains, millet, and sunflower seeds can be spread on the ground, preferably in parks and vacant lots, or on roof tops of buildings.

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

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

ROCK DOVE – Pigeon (Urban)

Possible Habitat Management Practices:

1. Artificial feeders, 45. Water development for wildlife, 46. Wildlife damage management

Song Sparrow

General Habitat Preference:

Open areas of stages 2 and 3 with nearby shrubs and small areas of stages 5 and 6. Often nest along forest edges.

Habitat Requirements:

Food: Weed seeds and insects of all kinds. Artificial feeders of all types can be used.

- Provide artificial feeders. Millet and sunflower seeds are favorites.
- Use insecticides only when necessary. When using insecticides, carefully follow the directions on the label.

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.

- Avoid disturbing nests.
- Plant and maintain shrubs.

Water: Frequent water in warm seasons is required.

- 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.

SONG SPARROW (Urban)

Possible Habitat Management Practices:

1. Artificial feeders, 22. Plan trees or shrubs, 45. Water development for wildlife, U1. Do not disturb nesting places, U4. Use pesticides carefully.

Wild Turkey

General Habitat Preference:

One-third to two-thirds of range in stages 5 and 6 of plant succession interspersed with areas in stages 3 and 4 of plant succession.

Habitat Requirements:

Food: Turkeys forage mostly on the ground for herbaceous plant seeds, nuts, acorns, and insects. They will use waste grain from croplands if adjacent to woodlands.

- Brush chop or disk small areas to maintain some stage 3 or 4 vegetation.
- Control (prescribed) burn every three to five years in stage 4 and 5 vegetation in eastern and southern United States.
- Clear-cut small areas (40 acres maximum) in large expanses of stage 5 and 6 woodland.
- Selective-cut forests in large areas of stage 6 woodland.
- Plant several perennial food plots and small (2 to 10 acre) fields to grasses and forbs in large expanses of stages 4, 5, or 6 vegetation, and in any other areas where food is limited.
- Plant mast trees in regions where suitable.
- Eliminate fall tillage of grain crops, especially adjacent to woodlands.
- Leave small areas of grain crops unharvested.
- Plant annual food plots near woodlands.
- Livestock grazing management should leave some forbs and grasses available for food. This is especially important in riparian areas and may include the development of livestock watering facilities on adjacent uplands to discourage congregation in and overuse of these areas.

Cover: The nest is a shallow depression on the ground lined with leaves and grass; it is well concealed in thick shrubs or woodlands. Usually the nest is within ½ mile of available water. Turkeys roost in trees or tall shrubs at night.

- Retain hardwood corridors in pine plantations in the southeast United States.
- Maintain a significant component of vegetation in stages 5 and 6 of succession, especially near streams.
- Plant trees and shrubs where cover is sparse or roost trees are limited.
- Livestock grazing management should leave thick herbaceous cover for nesting. Spring grazing can be detrimental to nesting habitat, especially in riparian areas.

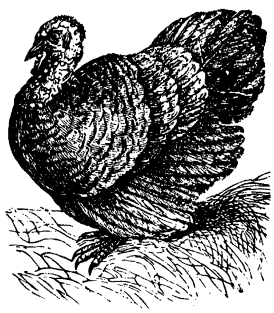
Water: Turkeys will use free-standing water when available.

- Where water is limited or absent, development of water sources is desirable: Catchment ponds, Guzzlers, Spring developments, Windmills

<u>WILD TURKEY</u>

Possible Habitat Management Practices:
2. Brush chopping, 5. Controlled burning, 6. Corridors, 8, Decrease bag/season limit, 9. Disking, 12. Wildlife survey, 14. Grain, leave unharvested, 16. Increase bag/season limit, 17. Livestock grazing management, 19. Plant food plots, 20. Plant grass and forbs, 21. Plant mast trees, 22. Plant trees or shrubs, 33. Riparian buffers, 41. Tillage, eliminate in fall, 42. Timber harvest, clear-cut, 43. Timber harvest, selective cut, 45. Water development for wildlife, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I - 6, *8, 12, 14, 16*, 17*, 19, 20, 21, 22, 33, 41, 45, 46
II & III - 2, 5, 6, 8*, 9, 12, 14, 16*, 17*, 19, 21, 22, 33, 41, 45, 46,
IV - 2, 5, 6, 8*, 9, 12, 14, 16*, 17*, 19, 20, 21, 22, 33, 41, 45, 46
V & VI - 2, 5, 6, 8*, 9, 12, 14, 16*, 17*, 19, 20, 21*, 22, 33, 41, 42*, 43*, 45, 46



Wood Duck

General Habitat Preference:

Stage 5 woodlands flooded with water and open water adjacent to stage 5 and 6 woodlands. Or stage 3 and 4 wetlands dominated by trees adjacent to stage 2 wetlands.

Habitat Requirements:

Food: Fruits and nuts of woody plants, some grain, seeds of water lily and other aquatic plants, and some insects. Insects are used by young wood ducks.

- During late fall and winter, temporarily flood stage 5 deciduous woodland with mast trees, such as oak, and grain crops. Natural flooding may occur, or small dikes and water control structures may be used.
- Leave small areas of cropland that are near wetlands and open water unharvested if flooding of the cropland to a 6" to 12" depth during the fall and winter if possible.
- Plant mast trees adjacent to wetlands or in areas that can be temporarily flooded.
- Selective cutting of woodlands that can be flooded is desirable to improve mast production.
- Construct ponds and/or wetlands and provide shallow water areas for aquatic emergent vegetation.

Cover: Wood ducks nest in cavities in trees of flooded woodlands or adjacent to water. They use stage 2 and 3 wetlands with an abundance of aquatic vegetation to raise young.

- Provide nest boxes if adequate nest sites are limited.
- Plant trees for future nesting sites.
- Construct ponds and wetlands. Provide shallow water areas where aquatic emergent vegetation can grow.
- Control water level to provide open shallow water areas (stage 2 wetlands) adjacent to areas dominated by emergent aquatic (stage 3 wetlands) vegetation.

Water: Water is required as described above.

WOOD DUCK

Possible Habitat Management Practices:
8. Decrease bag/season limit, 12. Wildlife survey, 14. Grain, leave unharvested. 16. Increase bag/season limit, 18. Nesting boxes/structures/platforms 21. Plant mast trees, 22. Plant trees or shrubs, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 37. Snags, dead, down woody material, 43. Timber harvest, selective cut, 44. Water control structures

Practices Recommended for Plant Succession Stages:
I, II, III & IV - 8*, 12, 14, 16*, 18, 21, 22, 25, 28*, 29*, 32*, 33, 36, 37, 44
V & VI - 8*, 12, 14, 16*, 18, 21*, 22, 25, 28*, 29, 32*, 33, 36, 37, 43, 44

Mammals

Beaver

General Habitat Preference:

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.

In some areas beaver are a nuisance. They can cut down trees that people want to save. They can dam up ditches and streams in undesirable places, flooding cropland and causing trees to die from flooding.

Habitat Requirements:

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

- Plant willows, other shrubs and deciduous trees near water that can be used by beaver. 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.
- Livestock grazing should be managed 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.
- Control beaver populations. Increase/decrease bag limits. Beaver can become too numerous and eat all available shrubs and trees. To prevent this it may be necessary to periodically remove some beaver.

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.

- Protect and maintain beaver dams. 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.
- Provide dam building material such as precut logs and branches in areas where such materials are scarce.

Water: Water requirements are discussed under cover requirements. Water should be of sufficient depth (5 feet) to allow free movement under the ice in winter.

<u>BEAVER (Wetland)</u>

Possible Habitat Management Practices:
8. Decrease bag/season limit, 12. Wildlife survey, 16. Increase bag/season limit, 17. Livestock grazing management, 22. Plant trees or shrubs, 33. Riparian buffers, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I - IV 8*, 12, 16*, 17*, 22, 33, 46

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 and around sunset. Coyotes may live in packs, alone, or in mated pairs.

Habitat Requirements:

Food: Coyotes eat poultry, rodents, persimmons, song-birds, cattle, rabbits, deer, woodchuck, goats, and water-melon. 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 percent 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.

- Timber harvest using small clear-cuts can increase prey abundance.

Cover:

- Manage livestock grazing so that adequate cover for prey is retained.
- Plant shrubs where cover is sparse.

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

Special: *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.*

COYOTE

Possible Habitat Management Practices:
12. Wildlife survey, 17. Livestock grazing management, 42. Timber harvest, clear-cut,
46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I, II, III & IV - 12, 17, 46
V & VI - 12, 17, 42, 46

Eastern Cottontail

General Habitat Preference:

Stages 3 and 4 of plant succession. Ideally, habitat components made up of ⅓ grassland, ⅓ cropland, and ⅓ shrub cover all interspersed together. Eastern cottontails also use parks, golf courses, and stream corridors in urban areas.

When overabundant, they can cause damage to ornamental and garden plants and may require wildlife damage management.

Habitat Requirements:

Food: A variety of forbs and grasses are eaten from spring through fall. In winter bark of shrubs and trees are often eaten.

- Plant ⅛ to ¼ acre annual food crops (grain sorghum is good) in areas with too little cropland. One plot per 15 acres maximum.
- Plant ⅛ to ¼ acre perennial food crops (grass and clover) in areas with too little grassland, again, one plot per 15 acres maximum.
- Brush chopping, chaining, roller beating and controlled (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.
- Clear-cut small areas (10 acres maximum) in large expanses of stage 5 and 6 woodlands.
- Livestock grazing management should avoid use of food and cover plots, and leave ample amounts of herbaceous vegetation in other areas used by cottontails for food and cover.

Cover: Cottontails use thick shrub or herbaceous vegetation for hiding and resting cover.

- 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.
- Provide brush piles where additional cover is needed.

Water: Necessary water is obtained from diet.

EASTERN COTTONTAIL

Possible Habitat Management Practices:

2. Brush chopping, 3. Brush piles, 5. Controlled burning, 8. Decrease bag/ season limit, 12. Wildlife survey, 16. Increase bag/season limit, 17. Livestock grazing management, 19. Plant food plots, 20. Plant mast trees, 22. Plant trees or shrubs, 42. Timber harvest, clear-cut,
46. Wildlife damage management

Practices Recommended for Plant Succession Stages:

I - 3, 8*, 12, 16*, 17*, 19, 20, 22, 46
II & III - 2, 3, 5, 8*, 12, 16*, 17*, 19, 22, 46
IV - 2, 3, 5, 8*, 12, 16*, 17*, 19, 20, 22, 46
V & VI - 2, 3, 5, 8*, 12, 16*, 17*,19, 20, 22, 42, 46

Eastern Fox Squirrel

General Habitat Preference:

Stages 5 and 6 of plant succession with interspersed small openings (stages 2 and 3 of plant succession). Squirrels also use urban areas with lots of trees.

Squirrels can be nuisances and cause property damage, thus requiring wildlife damage management techniques.

Habitat Requirements:

Food: Squirrels spend much time foraging on the ground. They feed on a variety of nuts, acorns, seeds, mushrooms, bird eggs, and, in places, corn.

- Selective-cut timber in large areas of stage 5 and 6 woodlands. Leave three to four den trees and several other mature trees per acre.
- Clear-cut small patches (less than five acres) in large expanses of stage 6 woodland.
- Brush chopping and controlled (prescribed) burns can be used to maintain small areas in stage 3 and 4 vegetation.
- Plant mast-producing trees along fence rows, adjacent to streams, or in other idle land areas. When possible, locate plantings adjacent to existing croplands.
- Leave some grain unharvested in croplands adjacent to trees.
- Leave some crop residue untilled in the fall, especially near woodlands.
- In urban areas, corn or sunflower seeds can be spread out on ground under trees used by squirrels. Artificial feeders can also be used.

Cover: Squirrels nest in cavities in trees or build a nest out of twigs and leaves. The nest is usually placed in the crotch of a tree over 30 feet above the ground. In areas where den sites are scarce, they will use nest boxes.

- Need 3 to 4 den trees or suitable nest boxes per acre. Nest boxes are most beneficial in stage 5 woodlands and urban areas lacking den sites.
- Leave hardwood corridors.
- Plant trees in large areas of stages 2, 3, and 4 vegetation (irrigate if necessary).
- Manage livestock grazing in riparian areas to maintain large deciduous trees and provide adequate herbaceous vegetation.

Water: Water requirements are generally met by the food consumed. However, in late summer this may not be adequate.

- In urban areas provide a pool or pan of water if other sources are not available.

<u>EASTERN FOX SQUIRREL (Urban)</u>

Possible Habitat Management Practices:

6. Corridors, 18. Nesting boxes/structures/platforms, 19. Plant food plots, 21. Plant mast trees, 22. Plant trees or shrubs, 45. Water development for wildlife, 46. Wildlife damage management

Eastern Gray Squirrel

General Habitat Preference:

Deciduous woodland in stages 5 and 6 of plant succession.

Squirrels can be nuisances and cause property damage, thus requiring wildlife damage management techniques.

Habitat Requirements:

Food: Squirrels spend much time foraging on the ground. They feed on a variety of nuts, grains, acorns, seeds, mushrooms, and buds.

- Leave some grain unharvested (corn preferred) and/or eliminate fall tillage of croplands adjacent to stage 5 and 6 vegetation.
- Selective-cut timber in large areas of stage 5 and 6 woodlands. Leave three to four den trees and several other mature trees per acre.
- Plant mast-producing trees along fence rows, adjacent to streams, or in other idle land areas. When possible, locate plantings adjacent to existing croplands.
- Livestock grazing should be managed to maintain adequate forage on forest floor. Maintain deciduous tree corridors along streams.

Cover: Squirrels nest in cavities in trees or build nests out of twigs and leaves. The nest is usually placed in the crotch of a tree over 30 feet above the ground. In areas where den sites are scarce, they will use nest boxes.

- Need three to four den trees or suitable nest boxes per acre. Nest boxes are most beneficial in stage 5 woodlands.
- Leave hardwood corridors.
- Plant trees and shrubs in open areas.

Water: Water requirements are generally met by the food consumed.

<u>EASTERN GRAY SQUIRREL</u>

Possible Habitat Management Practices:
6. Corridors, 8. Decrease bag/season limit, 12. Wildlife survey, 14. Grain, leave unharvested, 16. Increase bag/season limit, 17. Livestock grazing management, 18. Nesting boxes/structures/ platforms, 21. Plant mast trees, 22. Plant trees or shrubs, 41. Tillage, eliminate, 43. Timber harvest, selective cut, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I, II, III & IV - 6, 8*, 12, 14, 16*, 17*, 18, 21, 22, 41, 46
V & VI - 6, 8*, 12, 14, 16*, 17*, 18, 21, 22, 41, 43, 46

Mink

General Habitat Preference:

Mink prefer habitat associated with stream and river banks and the shores of a variety of wetlands.

Habitat Requirements:

Food: 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.

- 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.
- Controlled (prescribed) burns and brush chopping can be used to rejuvenate old decadent wetland vegetation that in turn can improve the habitat for the animals mink use for food.
- Control water levels with water control structures to promote the growth of emergent aquatic vegetation adjacent to open water.
- Ponds and wetlands can be constructed with shallow water areas where emergent aquatic vegetation can grow.
- Provide shallow water areas in ponds and wetlands where emergent vegetation can grow.
- Small dikes can be used to temporarily flood areas which can improve habitat for animals mink use for food.

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. The practices discussed under "Food" can also improve cover.

Water: Mink are found in association with water.

MINK (Wetland)

Possible Habitat Management Practices:
2. Brush chopping, 5. Controlled burning, 8. Decrease bag/season limit, 12. Wildlife survey, 16. Increase bag/season limit, 17. Livestock grazing management, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 44. Water control structures

Practices Recommended for Plant Succession Stages:
I - 8*, 12, 16*, 33, 44
II - 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 36, 44
III & IV - 2, 5, 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 36, 44

Muskrat

General Habitat Preference:

Stages 2 and 3 wetlands interspersed (mixed) together.

Habitat Requirements:

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

- 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.
- Controlled (prescribed) burns and brush chopping can be used to rejuvenate old, decadent wetland vegetation.
- Control water levels with water control structures. Provide areas in wetland with water less than 2 feet deep where cattails and bulrushes can grow. Up to 80 percent of the wetland should be able to grow such vegetation.
- Ponds and wetlands can be constructed with shallow water areas where emergent aquatic vegetation can grow.
- Provide shallow water areas in existing ponds and wetlands where emergent vegetation can grow.
- Small dikes can be used to temporarily flood areas to promote the growth of cattails and bulrushes.

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.

- Practices under "Food" can provide areas for lodges.
- Floating logs and rafts can be placed in open water areas. They should be anchored to the bottom.

Water: Muskrat need water of sufficient depth (4 feet) or flowing water that allows free movement under ice during the winter. During warm seasons, prefer water 1 to 2 feet deep, with around 20 percent of the wetland comprised of open water free of emergent aquatic vegetation. Again, controlling the water level when possible can be a beneficial management practice.

MUSKRAT (Wetland)

Possible Habitat Management Practices:

2. Brush chopping, 5. Controlled burning, 8. Decrease bag/season limit, 12. Wildlife survey, 16. Increase bag/season limit, 17. Livestock grazing management, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 36. Small dikes, for temporary flooding, 44. Water control structures, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:

I - 8*, 12, 16*, 33, 44, 46
II - 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 36, 44, 46
III & IV - 2, 5, 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 36, 44, 46

Raccoon

General Habitat Preference:

Raccoon 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 can become pests in urban areas and in wetlands where waterfowl nesting is important. In such instances, 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:

Food: Raccoons eat a wide variety of foods consisting of garbage, birds, eggs, fish, small mammals, insects, crayfish, grains, seeds, fruits, and foods prepared for human and pet consumption.

- 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.
- Controlled (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.
- Control water levels with water control structures. Provide areas in wetland with water less than 2 feet deep where aquatic emergent vegetation can grow.
- Ponds and wetlands can be built with shallow water areas where emergent aquatic vegetation can grow.
- Provide shallow water areas in existing ponds and wetlands where emergent vegetation can grow.
- Leave small areas of grain crops adjacent to woodlands unharvested.
- Plant annual food plots to grains.
- Clear-cut small areas (40 acres maximum, 10 to 20 acres preferred) in large expanses of stage 5 and 6 vegetation.
- Use selective-cut timber management.

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.

- Plant and maintain large deciduous trees especially in riparian areas and areas adjacent to wetlands.
- Maintain corridors and riparian buffers.

Water: Raccoons require water frequently during warm seasons.

- Build ponds or wetlands.
- Provide pools of water in urban areas.

RACCOON

Possible Habitat Management Practices:

2. Brush chopping, 5. Controlled burning, 6. Corridors, 8. Decrease bag/season limit, 12. Wildlife survey, 14. Grain, leave unharvested, 16. Increase bag/season limit, 17. Livestock grazing management, 19. Plant food plots, 22. Plant trees or shrubs, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33. Riparian buffers, 41. Tillage, eliminate in fall, 42. Timber harvest, clear-cut, 43. Timber harvest, selective cut, 44. Water control structures, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:

I - 6, *8, 12,14,16*,17*,19, 22, 25, 28*, 29*, 32*, 33, 41, 44, 46
II, III & IV - 2, 5, 6, 8*, 12, 14, 16*, 17*, 19, 22, 25, 28*, 29*, 32*, 33, 41, 44, 46
V & VI - 2, 5, 6, 8*, 12, 14, 16*, 17*, 19, 22, 25, 28*, 29*, 32*, 33, 41, 42*, 43*, 44, 46

White-tailed Deer

General Habitat Preference:

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:

Food: A variety of shrubs, forbs, grasses, and waste grain. Acorns and nuts are favorite foods. In the northern parts of the range for white-tailed deer, conifer trees are used in the winter.

- 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.
- 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 mast trees.
- Leave small areas of cropland adjacent to woodlands unharvested.
- Eliminate fall tillage of grain crop residue adjacent to woodlands.
- Time harvest of crops and hay so that fawning sites are not disturbed.
- Plant fields to grasses and legumes in large expanses of stage 4, 5, and 6 vegetation.
- Use controlled burning at three-year intervals in stage 5 pine woodlands or periodically in stage 3 and 4 vegetation.
- Brush chop, chain, or 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.
- Manage livestock grazing to leave some forbs, grasses, shrubs, and trees available for food and cover. You may need to include the development of livestock watering facilities in upland areas to discourage congregation of livestock and overuse in riparian areas. **This is the only situation where you would construct ponds.**

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.

- Control water levels with water control structures, or use small dikes to temporarily flood areas to encourage the growth of tall emergent aquatic vegetation.
- Plant trees and shrubs in ravines, along field borders, and other idle land areas.
- Provide corridors for travel lanes in open areas.

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.

Special: *Deer can seriously degrade habitat when overpopulated. Increasing or decreasing bag limits is essential for proper management.*

WHITE-TAIL DEER

Possible Habitat Management Practices:
2. Brush chopping, 5. Controlled burning, 6. Corridors, 8. Decrease bag/season limit, 12. Wildlife survey, 14. Grain, leave unharvested, 16. Increase bag/season limit, 17. Livestock grazing management, 19. Plant food plots, 20. Plant grass and forbs, 21. Plant mast trees, 22. Plant trees or shrubs, 41. Tillage, eliminate in fall, 42. Timber harvest, clear-cut, 43. Timber harvest, selective cut, 46. Wildlife damage management

Practices Recommended for Plant Succession Stages:
I - 6, 8*, 12, 14, 16*, 17*, 19, 20, 21, 22, 41, 46
II & III - 2, 5, 6, 8*, 12, 14, 16*, 17*, 19, 21, 22, 41, 46
IV - 2, 5, 6, *8, 12, 14, 16*, 17*, 19, 20, 21, 22, 41, 46
V & VI - 2, 5, 6, *8, 12, 14, 16*, 17*, 19, 20, 21, 22, 41, 42*, 43*, 46

Other Species (Amphibians, Fish & Butterflies)

Bullfrog

General Habitat Preference:

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:

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

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

- Construct ponds and wetlands with shallow water areas.
- Control water levels with water control structures to encourage the growth of emergent aquatic vegetation adjacent to open water.
- Provide shallow water areas in existing ponds and wetlands.
- Manage livestock grazing to maintain dense vegetative cover on shores and banks adjacent to water. Limit livestock watering access to only a small area of the wetland.

Water: Bullfrogs need stable water levels for hibernation and egg development.

- Control the water level. When possible maintain a constant water level.

Special: *Bullfrogs prefer a soft mud bottom under unfrozen water for hibernation.*

<u>BULLFROG (Wetland)</u>

Possible Habitat Management Practices:
8. Decrease bag/season limit, 12. Wildlife survey, 16. Increase bag/season limit, 17. Livestock grazing management, 25. Pond construction, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 32. Ponds, stop leaks, 33 Riparian buffers, 44. Water control structures

Practices Recommended for Plant Succession Stages:
I - 8*, 12, 16*, 33, 44
II, III & IV - 8*, 12, 16*, 17*, 25, 28*, 29*, 32*, 33, 44

Butterflies

General Habitat Preference:

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.

Habitat Requirements:

Food: Usually consists of sweet liquids such as nectar from flowers.

- Plant and maintain bushes and flowers that attract butterflies. Some examples are aster, verbena, zinnia, marigold, lilac, bush cinquefolia, and butterfly plant.
- 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.

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

- Use pesticides carefully.

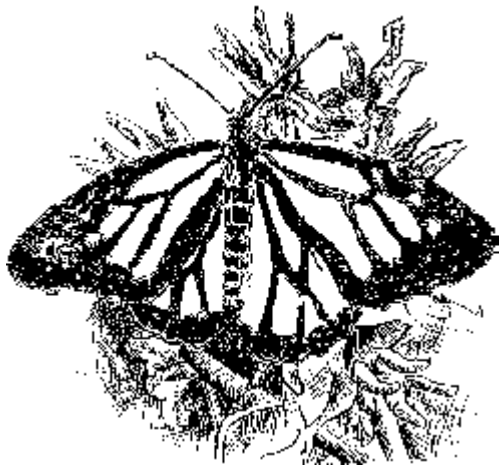
Water: Some butterflies can be seen collecting on moist sand or mud around water puddles.

- Providing an area with water puddles may attract groups of these butterflies.

BUTTERFLIES (Urban)

Possible Habitat Management Practices:

22. Plant trees or shrubs, 45. Water development for wildlife, U2. Plant flowers, U3. Rooftop/balcony gardens, U4. Use pesticides carefully.



Frogs

General Habitat Preference:

Weeds and aquatic vegetation on the edges of ponds, lakes, and slow moving streams. Mud bottoms are needed so frogs can bury themselves for hibernation during the winter.

Frogs can become so numerous that they become a problem in some areas. Vegetation control and other wildlife damage management practices may be needed.

Habitat Requirements:

Food: Insects.

- Use pesticides carefully.

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

- Construct ponds and wetlands. Both shallow water to encourage emergent aquatic vegetation and deep water for hibernation are desired. Small backyard pools are often adequate.
- Control water levels with water control devices to insure adequate water depth for hibernation. This is also useful for encouraging emergent aquatic vegetation.

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.)

FROGS (Urban)

Possible Habitat Management Practices:

6. Corridors, 25. Pond construction, 33. Riparian buffers, 44. Water control structures, 45. Water development for wildlife, 46. Wildlife damage management. U4. Use pesticides carefully.

Largemouth Bass/Bluegill

General Habitat Preference:

Ponds, lakes, and slow moving rivers.

Habitat Requirements:

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

- Construct ponds. 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).
- In clear water, fertilizer may be added to increase or promote phytoplankton.
- Determine pond balance using a minnow seine and catch records. A bass to bluegill ratio of 3 to 6 pounds of bluegill to 1 pound of bass is considered a good fish population balance.

- Harvest more or fewer bluegill, depending on seine sample results.
- Harvest more or fewer bass, depending on seine sample results.
- Remove existing fish and restock pond.
- Prevent or clear up muddy water (brown or gray color). Muddy water blocks sunlight needed in producing phytoplankton.
- 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.
- Reseed watershed.

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

- 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.
- Deepening the pond edges to 2 feet deep or more discourages rooted aquatic vegetation growth.

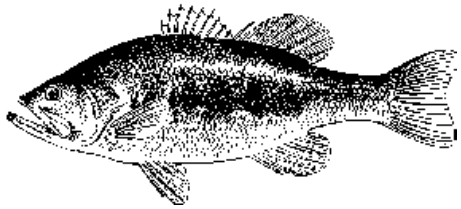
Water: These fish require an adequate quantity and quality of water.

- Stop pond leaks if and when they occur.
- Add water control structures if needed.
- Repair the spillway if needed and remove trees near the dam or dikes.
- Diversion ditches can be used to ensure an adequate water supply.
- 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 (1 foot below surface in shade).
- Test the water to see if it meets requirements.
- Aerate pond to increase oxygen and decrease carbon dioxide.
- Lime ponds (agricultural limestone) to increase soil pH if total alkalinity is below 20 ppm.

<u>BASS/BLUEGILL</u>

Possible Habitat Management Practices:
8. Decrease creel/season limit, 10. Fertilize ponds, 12. Fish survey, 16. Increase creel/season limit, 17. Livestock grazing management, 23. Ponds/lake, artificial reefs, 24. Ponds, clear muddy water, 25. Pond construction, 26. Ponds, diversion ditch, 27. Ponds, deepen edges, 28. Ponds, remove trees near dike, 29. Ponds, repair spillway, 30. Ponds, reseed watershed/filter strips, 31. Ponds, restock, 32. Ponds, stop leaks, 44. Water control structures

Practices Recommended for Plant Succession Stages:
I, II, III, IV, V & VI - 8*, 10, 12, 16*, 17*, 23*, 24*, 25, 26*, 27*, 28*, 29*, 30*, 31*, 32*, 44



Wildlife Management Practices (WMP)

In this section, various practices used to manage habitat are described in further detail. They are listed in alphabetical order. The descriptions are brief and general and are not meant to be comprehensive.

Identify and learn the practices that are recommended for the species listed in the *Regions* section. It is always wise to learn as much as possible about any practice before implementing it. Additional reading, research, and guidance from wildlife management professionals is suggested.

Some of the practices may seem contradictory. For example Deepen Edges discourages the growth of emergent aquatic vegetation, while Water Control Structures encourages growth. **Landowner objectives would determine which practices you recommend.**

At times, the best habitat management is maintaining an area in its current condition. This can include protecting the area from development and applying various management practices that will help maintain the area in the desired condition.

In this manual, costs and budgets are not considered when recommending practices. However, in actual situations, wildlife managers must consider economics when planning and recommending management practices.

Index to Wildlife Management Practices

1. Artificial Feeders

General Description:

Used primarily to feed wildlife in urban areas. A wide variety of feeder designs, methods, and different foods exist. Sunflower seeds and white proso millet are universal favorites. Some species prefer to eat fat rather than seeds. Some species prefer to eat on the ground rather than in a tree or on a balcony. For details on different designs and placement of artificial feeders contact a Cooperative Extension agent or state wildlife agency.

2. Brush Chopping (Mowing)

General Description:

Involves mowing dense vegetation (including fairly large shrubs) with a large rotary mower mounted behind a tractor.

Effect on Habitat:

- Helps keep vegetative succession in stage 2.
- Helps keep vegetative succession in stage 3.
- Sometimes reverts succession from stage 4 to stage 3. Helps remove competition with some kinds of shrubs, allowing grasses and forbs to grow better.
- Sometimes helps keep vegetative succession in stage 4. Maintains low shrub growth with some kinds of shrubs by encouraging resprouting.
- In stages 2, 3, and 4, helps rejuvenate grasses, forbs, and shrubs, which improves quality of future nesting sites.
- In stages 5 and 6, maintains dense low understory in properly thinned woodlands.
- In grass-clover plots, helps keep vegetation low enough for use by some wildlife species such as doves and turkeys.
- In wetlands can be used to increase interspersion by reducing vegetative cover.

This practice is used in stage 5 and 6 vegetation in the Southeast Mixed and Outer Coastal Plain Forest.

3. Brush Piles

General Description

Brush piles can be made from saplings or tree branches available from land clearing, timber harvest operations, tree pruning, etc. For best results, piles should be three to five feet high, 15 feet in diameter and very loose. This will allow grass and forbs to grow in them, creating more food and cover for wildlife.

Effect on Habitat:

- Particularly useful for rabbits and quail in areas with little cover, especially in areas with plenty of food such as corn, soybean, grain sorghum, and small grain fields and little cover.
- Useful at the edge between fields and woodlands.

Brush Piles

4. Chaining and Roller Beating

General Description:

Chaining: A large chain is strung between two bulldozers that run parallel to each other (50 to 100 feet apart depending on length of chain). The chain knocks down shrubs and small trees.

Roller Beating: Large, sharp metal blades are welded lengthwise on a roller similar to those seen on steam rollers used to pave roads. The roller is pulled behind bulldozers to knock down and chop up large shrubs and small trees. Roller beating is an alternative to chaining and has almost the same effect on vegetation.

Both techniques are used where rugged terrain, rocks, or large shrubs prevent the use of a brush chopper. This practice is not used like brush chopping to manipulate understory vegetation in woodlands.

Effect on Habitat:

- Stage 4 sometimes reverts succession to stage 3. Helps remove competition of some kinds of shrubs, allowing grasses and forbs to grow better.
- Sometimes helps keep vegetative succession in stage 4.
- Maintains low shrub growth with some kinds of shrubs by encouraging re-sprouting.
- In stage 5, causes succession to revert back to stages 3 and 4.

5. Controlled (Prescribed) Burning

General Description:

Burning should be done under cool, low-wind conditions, when danger of wildfire is low. Burn as early in the spring (before April 1 if possible) as conditions permit so ground nesting wildlife are not disturbed. Summer burning is common in the Southeast to control woody vegetation and promote herbaceous plants. Do burning only under close supervision of wildlife, forestry, and/or range professionals that have experience with controlled burns.

Results vary with the type of vegetation being burned, burning conditions, and the frequency and season of burning.

Some General Effects of Fire Are:

- Some understory shrubs sprout.
- Some shrubs are reduced, which improves the vigor and quality of forbs and grasses.
- Releases nutrients in soil.
- Reduces excessive dead vegetation (leaves, old grass, etc.) so seed can reach mineral soil.
- Scarifies (breaks down outside coating) some seeds so they can germinate.
- Rejuvenates grass and herbaceous vegetation, making area more productive.

Effect on Habitat:

Annual Burning:

- Stage 2, helps keep vegetative succession in stage 2.
- Stage 3, helps keep vegetative succession in stage 3.
- Stage 4, causes succession to revert to stage 3.
- Stage 5, in pines, keeps understory shrubs thinned out and stimulates grassy-weedy undergrowth if stands are properly thinned.
- Stage 6 is the same as stage 5.

Annual burning in stage 5 and 6 vegetation is a practice used most often in the Southeast Mixed and Outer Coastal Plain Forest.

Three- to Five-Year Interval Burning:

- Stage 2, allows succession to progress, but more slowly than if left alone.
- Stage 3, usually keeps vegetative succession in stage 3.
- Rejuvenates grass and grass-like vegetation in stage 3 and 4 wetlands.
- Periodic burning of vegetation-choked wetlands can improve the water and cover interspersion.
- Stage 4, makes shrub growth more dense due to abundant sprouting of shrubs.
- Stage 5, in pines, stimulates thicker understory shrubs if stands are properly thinned.
- Stage 6 is the same as stage 5.

Three to five-year interval burning in stage 5 and 6 vegetation is a practice used most often in the Southeast Mixed and Outer Coastal Plain Forest.

6. Corridors

General Description:

"Corridors" are areas of continuous habitat that permit animals to travel securely from one habitat to another. As the landscape becomes more broken up (fragmented) from construction of roads, parking lots, urban areas, certain methods of timber harvesting, clearing for agriculture, hurricanes, and/or wild fires, etc., only small islands of suitable vegetation might remain.

Effect on Habitat:

- Corridors allow animals to meet and mate with other animals of the same species but from different populations, thus maintaining genetic diversity.
- Corridors also allow animals to find and use islands of suitable habitat for feeding. In an urban area, relatively unbroken corridors found along streamside (riparian) areas and ravines allow wildlife to move into parks, and other suitable habitats. Preservation, maintenance, and creation of uninterrupted corridors are very important in wildlife habitat management.
- Corridors can be harmful if they are too small, *i.e.,* less than 100 meters wide. Predators may be attracted to edge, and corridors then become unknowing traps for some animals. For example, the probability of predation by raccoons, skunks, bobcats, coyotes, and nest parasitism (laying eggs in another bird's nest) by brown-headed cowbirds, increases in narrow corridors.

Note: Riparian buffers may act as corridors, but are not recommended for the same reasons. Corridors often may be needed in upland areas.

8. Decrease Bag/ Creel/Season Limit

Bass:

- Needed when seine samples and fishing records of pond reveal these situations:
- No recent bluegill hatch.
- Many medium-sized bluegill in poor condition.
- Bass are few in number but large and in good condition.

Bluegill:

- Needed when seine samples and fishing records of pond reveal these situations:
- Many recently hatched bluegill.
- Very few medium-sized bluegill.
- Bass less than one pound in poor condition.
- No young bass.

Game Birds and Mammals:

- Used when there are a high proportion of young animals in the bag or when hunting success or population levels are low.

9. Disking

General Description:

Areas in successional stages 2, 3, and 4 can be disked to promote the growth of annual and perennial forbs and grasses.

Effect on Habitat:

- Keeps vegetative succession in stage 2.
- Promotes the growth of annual forbs that some wildlife prefer for food and cover.
- In stage 3, causes succession to revert to stage 2.
- In stage 4, causes succession to revert to stages 2 or 3.
- Can be used to decrease vegetative cover and increase interspersion in wetlands (during dry periods).

10. Fertilize Ponds

General Description:

Well-fertilized ponds can produce up to three times as many pounds of fish as unfertilized ponds. Ponds should **not** be fertilized if they have an aquatic weed problem.

Start fertilizing fish ponds in the spring when the water temperature reaches 60 degrees F. Apply at the rate of 40 pounds of 20-20-5 (or its equivalent) granular, 1 gallon of 1-36-0 liquid fertilizer per acre, or 8 pounds of soluble powder per acre at two-week intervals, or until a good green color (phytoplankton bloom) develops in the pond. Place the granular fertilizer on an underwater plat-form in water less than 2 feet deep. Make additional applications of fertilizer (at the same rate per surface acre) every 3 to 4 weeks, or when the water clears (becomes less green) so you can see deeper than 24 inches into the water. Continue this program until water temperatures drop below 60 degrees Fahrenheit in the fall.

If a pond does not develop a green bloom after several fertilizations, it probably is acidic and needs to be limed or has an aquatic weed problem. Lime is based on soil tests of pond mud. When water quality tests show total alkalinity is below 20 ppm, adjust it by using agricultural lime.

If a pond has been properly fertilized for the past five years and if there is no concentration of weeds, future fertilizations can be done using phosphate only. The rate is 10 pounds of super-phosphate per acre per application. Make the first three applications two weeks apart, and at three to four week intervals thereafter. Granular fertilizer must be distributed from a fertilizer platform. Liquid fertilizer should be mixed with pond water and broad-cast from a boat for large ponds or from the bank of small ponds. Water soluble powdered fertilizers can be broadcast from a boat or from the bank.

Effect on Habitat:

- Needed in fish ponds with water clear enough so that a white object can be seen at 24 inches deep.
- Fertilizer in ponds stimulates phytoplankton production, which is the first step in the food chain of a fish pond.

12. Fish (pond) or Wildlife Survey

General Description:

Fish Surveys

Population balance is first established in a farm fish pond by stocking the correct number of fish. After the first year, check fish pond balance during early summer by using a ⅛-inch mesh minnow seine 15 feet long and 3 feet deep. Seine at intervals around the pond by anchoring one end at the bank, pulling the seine straight out from the bank to its full length, and then sweeping in an arc back to the bank. Four to five seine sweeps in an average pond is usually enough.

Balance is determined by comparing age groups, condition, and numbers of bass and bluegill caught in the seine and from fishing records. Recent reproduction of both bass and bluegill in the seine indicate that the fish population is balanced. Fish caught by hook-and-line can be evaluated on body condition (fat, skinny, size of head in relation to body, etc.). Evidence of disease is a good indicator of pond imbalance.

Unwanted species (bullheads, crappie, etc.) may also be caught in the seine or when fishing, indicating that the pond needs to be poisoned or drained.

Wildlife Surveys

Monitoring of wildlife for trends of increasing or decreasing populations or body weights of animals is important for land managers. Data on quail, white-tailed deer, breeding birds, turkey, and many other species are routinely collected by wildlife biologists using methods such as roadside counts, call counts, check stations, transects, and questionnaires. These data are then used to prescribe future harvesting or land management strategies.

14. Grain, Leave Unharvested

General Description:

Strips or blocks of grain crops (⅛ to ¼ acre is usually sufficient) can be left unharvested. This is especially valuable if the strips are left adjacent to herbaceous, shrub, or tree cover.

Effect on Habitat:

- Provides a food source for many species of wildlife.

Wildlife Management Practices II

15. Harvest Timing (Crops/Hay)

General Description:

When possible, avoid harvesting crops or hay during nesting and fawning seasons to reduce nest destruction and mortality. Use flushing bars when possible. In most situations it is not possible to avoid harvesting during the entire nesting season, but any significant delay can be a benefit.

16. Increase Bag/Creel/Season Limit

Bass:

Needed when seine samples and fishing records of pond reveal these situations:

- Many recently hatched bluegill.
- Very few medium-sized bluegill.
- Bass less than one pound in poor condition.
- Few or no young bass.

Increase bass harvest cautiously. Target the bass less than one pound. Spread the harvest over the entire summer.

Bluegill:

Needed when seine samples and fishing records of pond reveals these situations:

- No recent bluegill hatch.
- Many medium-sized bluegill in poor condition.
- Bass few, large, and in good condition.
- Target medium-sized bluegill, using seine harvest or shoreline rotenone.

Game Birds and Mammals:

Needed when animals show signs of overpopulation such as:

- Disease.
- Destruction of habitat by crowded animals.
- Poor body condition.
- Excessive fighting.
- Few young animals in bag.
- Higher percentage of older animals than young in fall population (indicates poor reproduction due to inadequate nutrition); thinning population will leave more food to go around.

17. Livestock Grazing Management

General Description:

A practice for managing the use of vegetation by livestock. Can be used to manipulate successional stages to benefit wildlife (*e.g.,* maintain open areas in woodlands). This practice also includes livestock exclusion when necessary.

Some General Principles Are:

Proper Grazing Use: On native, perennial rangelands and riparian areas, do not graze more than 50 percent of the yearly growth of vegetation preferred by livestock.

Timing: Avoid grazing areas during periods when wildlife and/or vegetation is vulnerable to damage. *Examples* — Grazing riparian areas in the summer can damage young shrubs and trees; grazing in spring can reduce cover needed by ground-nesting wildlife.

Intensity: Relates to how many livestock are on a given area at any one time. Many livestock on an area is high intensity, few livestock is low intensity. High intensity grazing should be for shorter periods of time or all the vegetation will be used. High intensity grazing increases the chance that ground nests will be trampled, and should not be used in important nesting areas during the nesting season.

Rotation: Livestock should be moved from an area before vegetation is over-used. The vegetation is allowed to recuperate (rest) before it is grazed again.

Tools:

Fencing, water developments, salting, and herding are the most common methods used to control livestock grazing. Whenever livestock grazing management is recommended, it is implied that the necessary tools will be available. Some information on these tools follows.

Fencing: Useful to protect food plots, ponds, streams, wetlands, woodlands, or other natural vegetation areas from livestock. Often necessary for managing livestock grazing (such as rotating areas being grazed, controlling access to water, etc.) Fences interfere with movement of wildlife, especially large animals such as pronghorn, deer, and elk. They should be recommended only when necessary and designed to allow movement of wildlife.

The top wire should be a maximum of 42 inches above the ground (this allows some wildlife to jump over) and the bottom wire should be smooth and a minimum of 16 inches above the ground (this allows some wildlife to go under).

Water Developments: Can be used to distribute livestock grazing in semi-arid and arid regions of the United States. The more watering places available, the less likely livestock will concentrate in one area, and the more flexibility one has in managing livestock. Alternative water sources are often essential when developing grazing systems that permit occasional rest of important areas (*i.e.,* riparian areas) during critical growing seasons. Catchment ponds, dugouts, windmills, and spring developments discussed under Practice 45-Water Developments for Wildlife are also used to develop water for livestock.

Salting: Locating salting areas away from watering places and occasionally moving locations can be used to encourage uniform distribution of livestock.

Herding: Using horseback or other means to move animals is useful for achieving proper distribution of grazing animals. Used to discourage congregation of animals in attractive areas for long periods of time.

Effect on Habitat:

- Used to insure livestock grazing does not over-use vegetation that is also used by wildlife.
- If properly managed, livestock grazing is usually not harmful to wildlife habitat and in some instances, is used to improve wildlife habitat.
- Changes in grazing management are recommended only when it is evident that livestock use is damaging wildlife habitat or is needed to improve the habitat for selected wildlife species.
- Periodic grazing of vegetation (cattail) choked wetlands can improve water and vegetation interspersion.
- Reduces siltation, turbidity, and stream bank erosion.
- Reduces stream and pond pollution from livestock waste.

18. Nesting Boxes Structures/Platforms

General Description:

The particular design and placement of nesting structures and boxes often determines which wildlife species will use the structure. *Contact a Cooperative Extension agent or wildlife specialist for specific designs of nest boxes and other artificial nesting structures.*

Boxes: Some species have to nest in cavities that they don't excavate themselves. If natural cavities are not available, artificial cavities (nest boxes) can be used.

Each species needs a certain kind of cavity (diameter of hole, depth, area, etc.) in a certain location (field, woods, water, etc.) and at a certain height (4 feet to 20 feet high).

Platform: Species such as the red-tailed hawk build nests in large trees or other structures above the ground. If nesting sites are scarce, artificial platforms placed on poles above the ground may be used.

Structures: Canada geese and mallards will also use platforms if they are placed near water. In wetlands dominated by open water and lacking islands or peninsulas, floating nest structures are often used by Canada geese and mallards.

Effect on Habitat:

- **In Wooded Areas:** Boxes are especially useful in woodlands in stage 5 succession or where trees are not old enough to provide cavities.
- **In Open Areas (Stages 2, 3, and 4):** Always useful unless an abundance of nesting cavities or locations, such as hollow fence posts, isolated den or nesting trees, etc., already exist.
- **In Wetlands:** Provides secure nesting sites in areas lacking islands, peninsulas, or tall, dense vegetation.

19. Plant Food Plots (⅛ to 2 Acres)

General Description:

Strips can be long and narrow (300 to 400 feet long and 15 to 20 feet wide) or square blocks and preferably located at the edge between two or more kinds of habitat (such as between woodland and hayfield). Best if located next to natural cover such as shrubs, etc. Food plots should be planted prior to June 1 (except for cool season annual grasses-clover mixture) to ensure maturity.

Where possible and in regions with heavy and drifting snow, plots should be square (1 acre minimum) and located near cover on the downwind side. Plots should be located so that nearby shrub and tree cover does not encourage snow to drift into them. Plots must be protected from livestock.

Food plots include the planting and temporary flooding of Japanese millet in wetlands to provide food for waterfowl. Japanese millet plantings are often larger than two acres and used most often in the warmer regions of the United States.

Effect on Habitat:

- **Annual Food Plots** – Usually Grains: Useful in areas of natural plant succession where row-cropping (corn, soybeans, grain sorghum, small grains, etc.) is scarce. One small (⅛ to ¼) acre plot per 15 acres or large (1 to 2 acres) plot per 60 acres.
- Provides food for many species of wildlife.
- **Perennial Food Plots – Usually Introduced Grasses and Clover or Other Forbs:** Useful in areas of row-crop farming (corn, soybeans, grain sorghum, small grains, etc.) especially where shrub field borders are scarce. Useful in most areas with absence of stage 3 succession.
- Provides both food and cover for many species of wildlife.

20. Plant Grass and Forbs

General Description:

Plant large fields of native grasses and forbs. Introduced grasses and forbs are not recommended because they do not provide suitable habitat structure. Native legumes may be used when suitable. Field size should be between 2 and 40 acres.

Effect on Habitat:

- Smaller fields are useful for wildlife in wooded areas with little acreage in stages 2 and 3.
- Larger fields are useful in areas with little acreage in hayfields, pastures, or small grains that are used by some wildlife species for winter survival, nesting, or roosting cover.
- These fields will be used for food as well as cover by many species.
- These plantings should be native plants and they should be grazed, burned, or mowed occasionally (once every 3 to 5 years) to prevent deterioration of the vegetation through litter buildup.

Contact a Cooperative Extension agent for planting recommendations.

21. Plant Mast Trees

General Description:

Mast means seed or fruit that provides food for wildlife. For the purpose of this handbook, mast trees are defined as those trees which produce an annual crop of acorns or other nuts. Mast trees produce an abundance of mast and they may be a desirable supplement to plant for wildlife. Plant mast trees in early spring when they are still dormant.

For specifics about what, when, and how to plant, contact your local Cooperative Extension agent or Natural Resource Conservation Service office.

Effect on Habitat:

- Especially useful for deer, squirrels, turkeys, and wood ducks in areas with little available mast, such as large expanses of farmland, pine woodland, field borders, urban areas, etc.

22. Plant Trees or Shrubs

General Description:

When properly located, shrubs and trees can benefit many species of wildlife.

Fruiting shrubs and small evergreen trees are especially good for urban areas, fencerows, hedgerows, odd-areas, property boundary markers, and other idle land plantings. It may also be desirable to plant large trees and willows in some areas. In dry regions, irrigation or water harvesting is often needed to grow shrubs and trees. In large open areas, multi-row plantings of at least 15 rows of trees and shrubs are beneficial, especially if planted adjacent to tall herbaceous cover or a good food source. It is best to plant shrubs and trees in the early spring when they are still dormant.

For specifics about what, when, and how to plant, contact your local Cooperative Extension agent or Natural Resource Conservation Service office.

Effect on Habitat:

- Useful along fences in areas where field borders (such as fencerows) are scarce.
- They are especially useful to make travel lanes for wildlife to move safely across open fields between two areas of cover.
- Useful along the edges between fields and woodlands, around farm homesteads, and urban areas.
- Can be a valuable practice used to restore and improve riparian areas.

23. Ponds/Lakes, Artificial Reefs

General Description:

Large rocks can be piled together, or brush (used Christmas trees are good) weighted down and submerged to provide cover for fish.

This practice is recommended for ponds or lakes that are larger than 10 acres. In smaller bodies of water, artificial reefs may allow prey fish (bluegill, etc.) to be overly successful at avoiding predators. This can lead to an overabundance of prey fish that are in poor condition.

24. Ponds, Clear Muddy Water

General Description:

You can clear muddy water in any of these ways:

- Broadcast agricultural limestone on the pond surface at the rate of 500 to 1,000 pounds per surface acre or at the rate recommended based on a pond mud soil test.
- Broadcast agricultural gypsum on the pond surface at 12 to 25 pounds per 1,000 cubic feet of water (500-1000 pounds per acre-foot of water).
- Dissolve aluminum potassium sulfate (commercial alum crystals) in water and spread on the entire surface at the rate of 5 to 15 pounds per acre-foot of water.
- Broadcast cottonseed meal on the pond surface at the rate of 100 pounds per acre.

Effect on Habitat:

- Removes/settles silt in the water, allowing sunlight to stimulate phytoplankton.
- This stimulates the first step in the pond food chain.
- At the same time, any erosion of the watershed (which may have caused the muddy water) must be stopped.
- Common carp may also be the cause of muddy water. Poisoning or draining the pond may be necessary for pond renovation.

25. Pond Construction

General Description:

This practice should be recommended for creating **new** ponds and wetlands with permanent water. There is no need to mark additional pond maintenance practices.

Dams, dikes, and levees can be used in natural drainages to create ponds and wetlands with *permanent* water for use by fish and wildlife.

The design varies, depending on the purpose for constructing the pond and the region where it is constructed. For example, steep sloping sides benefit fish and gentle sloping banks benefit waterfowl.

Contact your local Cooperative Extension Service or Natural Resource Conservation Service office for design details.

26. Ponds, Diversion Ditches

General Description:

Diversion ditches should be constructed so that a small amount of water enters the pond and exits the spillway. The bulk of water is diverted around the pond through the diversion ditch. In extremely dry regions, diversion ditches can be used to bring extra water to the pond from surrounding watersheds during rains.

Effect on Habitat:

- Needed for ponds with too much water flowing through them. Too much water dilutes and wastes fertilizer and requires expensive water control structures for managing the water flow.
- Used to protect ponds from flood waters.
- In dry regions these are used to fill ponds that have inadequate watersheds.

27. Ponds, Deepen Edges

General Description:

Usually used to improve ponds for fish. To deepen pond edges, draw the water down, let banks dry out, and use a bulldozer or tractor with blade.

Edges should be deepened to a minimum of 2 to 3 feet with steep side slopes.

Soil removed from the edge can be piled around the bank and then smoothed out and planted to grass and legumes.

Effect on Habitat:

- Needed to reduce rooted aquatic vegetation around the edge of a pond.

28. Ponds, Remove Trees Near Dike

General Description:

Roots of trees growing on the dam will loosen the compacted soil and cause leaks. This practice is needed any time trees occur on the dam or when trees occur around more than ⅓ of the remaining pond bank. It also improves the pond's capability to hold water, and cleans pond banks for use by doves.

Effect on Habitat:

- Trees growing around the pond can reduce the water level.
- Some species (such as doves) prefer clean banks for watering.
- Some nearby trees are desirable for many wildlife species, but need not occupy more than 1/3 of the pond bank.

29. Ponds, Repair Spillway

General Description:

Needed if the spillway in existing dam or dike is eroding or otherwise damaged, keeping the pond level too low and increasing the chance of the dam washing away during heavy rains.

30. Ponds, Reseed Watershed/Filter Strips

Effect on Habitat:

- One method of reducing erosion in the watershed.
- Reduces silt entering the pond water and allows sunlight to promote phytoplankton.
- Improves water quality and provides nesting, brooding and winter cover for some wildlife.

31. Ponds, Restock

General Description:

Restock only after all fish in pond are removed, either by draining pond or applying rotenone.

Rotenone kills fish by interfering with the fish's ability to use oxygen or respire. It is applied as a liquid or powder during early fall.

Bluegill fingerlings are then stocked in the late fall, and bass fingerlings are stocked the following June. Present stocking rates are 1,000 bluegill and 100 bass per surface acre if the pond is to be fertilized or 500 bluegill and 50 bass per surface acre if the pond will not be fertilized. Each state has its own stocking recommendations.

As many as 50 channel catfish fingerlings per acre may also be stocked at the same time as the bluegill.

Effect on Habitat:

- The techniques of draining or rotenoning ponds allow unbalanced fish populations to be removed and new ones started with a balanced ratio of bass to bluegill.
- Needed in ponds with:
  - Extremely unbalanced fish populations
  - An overabundance of small, stunted bluegill
  - Few fish of usable size
  - Presence of wild fish species such as carp, shad, gold fish, suckers, crappie, green sunfish, or bullhead catfish.

32. Ponds, Stop Leaks

General Description:

Leaks in existing ponds may be stopped with:

- Bentonite at 100 pounds per 100 square feet.
- Tetrasodium pyrophosphate at two tons per acre.
- Soda ash at five tons per acre.
- In severe cases, plastic liners may be used (this is expensive).

Effect on Habitat:

- Necessary in leaking ponds with limited water supply.

33. Riparian Buffers

General Description:

A riparian buffer is an area of trees, shrubs, forbs, and grasses located adjacent to streams, lakes, ponds, and wetlands. Riparian buffers are important for providing habitat and protecting water quality in streams and wetlands. Recommended minimum width — 100'.

Effect on Habitat:

- Provide shade for summer cooling and cover in the stream or wetland.
- Provide corridors for wildlife to move from one habitat to another.
- Slows overland flow of water and helps maintain water quality.
- Provide structural diversity both adjacent to and within the stream. As trees die then fall into the stream, the large woody debris helps create pools and riffles and provides cover for fish and other aquatic life.
- Leaves, stems, branches, and large woody debris fall into streams providing nutrition and habitat for aquatic insects, a major food source for fish and amphibians.
- Insects from the trees fall into the stream and provide a food source for fish, amphibians, and other aquatic life.
- Tree roots provide soil and streambank stability.

Note that this is a distinctly different practice than corridors. If an area needs corridors, that will need to be checked in addition to this practice.

34. Roosting Platforms/ Perching Poles

General Description:

Some wildlife species perch or roost on fence posts, in trees, or in tall shrubs to avoid danger from predators and/or to search for food on the ground below. If sufficient trees or tall shrubs are not available, artificial platforms covered with brush or perch poles can be useful. The particular design and placement of roosting platforms and perch poles often determines which wildlife species will use the structure.

Contact your Cooperative Extension agent or wildlife specialist for details on specific designs and placement of these structures.

Effect on Habitat:

- Useful in open areas that lack roost or perch sites.

36. Small Dikes, for Temporary Flooding

General Description:

Small dikes are used to *temporarily* flood (usually in the fall or winter) feeding and nesting areas for waterfowl. Grain fields, Japanese millet plantings, and stage 5 and 6 hardwood woodlands are examples of feeding areas flooded to attract waterfowl. Temporary flooding is also used to improve existing wetlands as nesting habitat for some wildlife such as the redhead duck, and to control the growth of aquatic vegetation.

This practice is only recommended in existing wetlands or potential waterfowl feeding and nesting areas when appropriate.

When this practice is recommended it is implied that adequate water control structures will be included and should not be an additional recommendation.

37. Snags, Dead and Down Woody Material

General Description:

In forested habitat, leave or provide a minimum of seven snags, 10-20+ inches in diameter, and four down logs per acre. Large down logs 24 inches in diameter, 50 feet long are optimal. In intensively managed forests of smaller material, leave logs of 12+ inches in diameter and 20 feet long — minimum. Conifer logs usually decay slower and provide habitat over a longer period of time. Logs of different species with remaining limbs, bark, and stumps should be retained for habitat diversity.

Snags should be retained as an eventual source of dead and down woody material in forested habitats.

In streams, woody material creates stream diversity. It creates structure that may be used as cover.

Effect on Habitat:

- Dead and down wood is important to numerous species of terrestrial wildlife as sites for feeding, reproducing, hiding, and resting. The use of dead and down material varies as the log decomposes.
- Down logs in various stages of decay provide denning sites and a rich food source for insect- and fungi-eating animals.
- Down logs provide drumming sites that are important for mating rituals for ruffed grouse.
- As logs decompose, they can hold more moisture and provide an essential cool, moist microhabitat for many species of reptiles, amphibians, and small mammals.
- Dead and down material provides sites for regeneration of some tree and shrub species.
- Dead and decaying logs serve as sites for nitrogen fixation by some bacteria.
- Logs, large limbs, and smaller branches provide shade, cover, and food for aquatic organisms.
- Snags provide roosting and perching sites for many birds.
- Snags provide sites for cavity construction.
- Snags provide foraging sites for many species.

41. Tillage, Eliminate in Fall

General Description:

When tillage is necessary, inversion tillage (soil is turned over and covers up crop residue) such as mold board or disc plowing should be avoided. Tillage implements such as chisel plows and rod weeders can be used to do tillage operations without turning the soil over.

Effect on Habitat:

- Provides waste grain as a food source used by many species of wildlife.

42. Timber Harvest, Clear-cut

General Description:

A type of timber management where all trees are harvested at the same time on a tract of land, usually for the purpose of regenerating a shade intolerant timber species. Often prescribed burning is used to prepare the site to plant trees. It is assumed this will be done if appropriate and should not be recommended in addition to this practice.

Effect on Habitat:

- Clear-cuts can be long and narrow with irregular shapes to increase habitat for wildlife species that are attracted to edge, or they can be circular to minimize edge for those species that do not benefit from the consequences of edge (*i.e.,* predators, brown-headed cowbirds). The increased sprouting of shrubs, grasses, and forbs that result from sunlight reaching the forest floor following a clear-cut is beneficial to several wildlife species. Many wildlife species also prefer the edge between forest and openings created by such cuts.
- This practice can be harmful to wildlife species such as red squirrels, woodpeckers, etc. that need woodlands to supply all of their welfare requirements. But again, if harvested tracts are not too large and there are sufficient amounts of surrounding forest, these species should remain.
- Clear-cuts are useful in large forested areas with very little acreage in stages 2, 3, and 4 of succession. Reverts stages 5 and 6 to 2, 3, and 4, with more emphasis on stage 4. If controlled burning is used to prepare the site, then stages 2 and 3 will predominate over stage 4 in the short term.
- When recommending clear-cuts, take into consideration the availability of snag and cavity trees in the immediate vicinity and leave them when possible. At least three to four snags and den trees per acre should be left in clear-cut areas.

Wildlife Management Practices III

43. Timber Harvest, Selective Cut

General Description:

Also called "all-aged management." Only selected trees are cut, a few at a time. Stands managed this way have trees of all ages.

This benefits many different species of wildlife. Animals preferring stages 2, 3, and 4 of succession benefit from the sprouting of shrubs, grasses, and forbs where individual trees were cut, yet mature trees are also present for species that prefer stages 5 and 6.

Effect on Habitat:

- Stimulates shrub, grass, and forb understory production in woodlands due to removal of large tree crowns which would otherwise cause shading.
- Also stimulates growth of mast-producing and other surrounding trees.
- At least 3 to 4 den trees and 3 to 4 old mature and large dead (snags) trees per acre should be maintained.

44. Water Control Structures

General Description:

Various structures made out of concrete, pipes, wood, etc., are useful to control the water level in wetlands and ponds.

They usually are combined with dams and shallow dikes for water control.

Recommend only when inadequate or no structures are present on an existing dam or dike. For specific designs of such structures see the local Natural Resources Conservation Service office.

Effect on Habitat:

- Allows management of water levels to increase or decrease the amount and type of aquatic vegetation. Useful for creating a desirable mix (interspersion) of open water and emergent aquatic vegetation.
- Can be used to create shallow water areas.
- Can be used to manage the quality of water in the pond or wetland and for control of unwanted fish.
- Can be used to control water levels in flooded timber, drawing water down to prevent tree mortality.

45. Water Developments for Wildlife

General Description:

You can provide drinking water for wildlife and livestock in these ways:

- **Guzzlers:** Built by covering an area with an apron of fiberglass or some other material that sheds rain. The water is collected in a storage tank and slowly released into a trough from which wildlife can drink.

- **Dugouts:** Large, earthen catchment basins (built with bulldozers, backhoes, or draglines) designed to collect water for use by livestock and wildlife for drinking. They can be designed to collect run-off water from precipitation, or in areas with a high water table, they can be filled by ground water. Side slopes should be gentle to provide easy access to the water for wildlife. They are also often used by waterfowl for resting and brood habitat.

- **Catchment Ponds:** Earthen dikes are constructed to retain water (usually run-off water from precipitation) in natural drainage areas. Placement of the dike is critical to avoid damage by floods and also have the ability to collect sufficient water. They are also used by waterfowl for resting and brood habitat.
- **Windmills:** A well is drilled in the ground and the windmill is used to pump water out of the ground and into a watering trough. The trough should be designed so wildlife can use it without danger of drowning.
- **Spring Developments:** Water seeping out of the ground or near the ground surface is collected in perforated pipe and put in a watering trough. This practice is feasible only in areas that have springs.
- **Birdbaths and Backyard Ponds:** Small ponds can be constructed in backyards and other urban areas to provide water for a variety of wildlife. Birdbaths are also useful for providing water in urban settings.

46. Wildlife Damage Management

General Description:

Professional wildlife biologists often have to exclude, trap, relocate, euthanize (humanely put to death), repel, poison, shoot, or frighten individual animals in order to reduce or eliminate damaging behaviors or health hazards. Examples of wildlife damage are coyotes that prey on sheep or pets, raccoons or bats in the attic, deer eating ornamental plants in the yard, skunks under the house, snakes in the house, bird strikes at airports, cormorants eating catfish fingerlings at an aquiculture facility, or starlings roosting in urban trees and defecating on sidewalks, creating a health hazard.

Wildlife damage management may be recommended in addition to the practice of increasing bag/creel limits if individual animals are nuisances.

- Direct control techniques like relocation, trapping, toxicants on livestock collars, and selectively shooting only problem animals are commonly used and effective.
- Nonlethal methods of predator control include sheep confinement and herding, use of guard dogs, and the use of exclusion fences. Nonlethal control techniques like repellents (also used on collars mounted on livestock prey-at-risk) and chemical sterilization are currently extremely limited in their usefulness.
- Methods of controlling herbivores (deer, rabbits, etc.) include exclusion fences, taste and area repellants, scare tactics (such as propane cannons), decoys (of predators), and others. Trapping and relocating large animals like deer and elk is not cost effective.
- Methods of bird control include scary balloons, exclusion devices, live trap and relocation, and others.

Activities

Judging Activities

The following pages contain information and examples for the various wildlife judging activities. The 4-H contestants will be expected to participate in all the activities presented in this manual. Scorecards, similar to the ones shown in the following sections will be used in the Georgia 4-H Wildlife Judging event.

Activity A and B	**Prescribing On-site Wildlife Management Recommendations**
Activity C I	**Interpreting Wildlife Habitat From Aerial Photographs**
Activity C II	**Giving Oral Reasons For Aerial Photographs**
Activity D	**Identifying Common Wildlife Foods**

ATTENTION:

Beginning and young 4-H'ers are not expected to perform all the above activities for all species. Junior 4-H'ers (5^{th}-8^{th} grades) will be required to know only eight species for Habitat Management and Aerial Photographs. Those species are: Brown Thrasher, Eastern Bluebird, Eastern Cottontail, Eastern Gray Squirrel, Northern Bobwhite, White - tailed Deer, Bluegill and Large Mouth Bass. Juniors will only be required to know identification of food categories and not which species consumes a displayed food item.

Activities A & B

Activity A & B

On-Site Wildlife Management Recommendations

Activity A & B (worth 20 points each) addresses the prescription of Wildlife Management Practices (WMPs) necessary to improve an area for each of the wildlife species listed. A blank scorecard is shown at the end of the A & B section. Only practices that are appropriate for the specific contest being administered will be considered for this contest.

In *Urban* contests, the following practices and numbers should also be used. These practices are not in the Management Practices section, but are discussed in the *Wildlife Species* section under the appropriate species. Look at the table in the Urban *Regions* section to see which species these practices may be used for.

U1. Do not disturb nesting places;
U2. Plant flowers;
U3. Rooftop balcony gardens;
U4. Use pesticides carefully;

The scorecard for Activity A & B is completed using information learned from the table for the *Southeast Mixed and Outer Coastal Plain Forest, Wetland* and *Urban Regions* and from the *Wildlife Species* and *Wildlife Management Practices* sections. The appropriate box for all WMPs that would improve the area for each species considered at the contest should be marked with an "X." Some boxes/practices will have to be marked based on observation of the habitat or information provided. Some boxes should **not** be marked because the information to make a decision is not available. Refer to the Wildlife Species section for more details.

Consider each species separately. For example, WMPs for the deer would not be the same as for bluebirds. Prescribe only the appropriate practices that have been listed as applicable for the species.

The Wildlife Management Recommendations activity can be used in both the rural and urban areas also. Any of the practices can be used in both areas. Prescribed practices in urban areas should not be limited to the urban oriented practices listed above. This is just a list of practices that are more appropriate for urban areas which are not described in the Wildlife Management Practices section.

Cost or other land management objectives should not be considered.

Example — Habitat Management Recommendations

Suppose the area you are judging is 300 acres of all stage 6 hardwood woodland and wild turkey is the wildlife species of concern.

By reading about the wild turkey in the Wildlife Species section and looking at the table in this section, you can see that practices 2, 5, 6, 8, 9, 12, 14, 16, 17, 19, 20, 21, 22, 33, 41, 42, 43, 45, and 46 are commonly used for managing turkeys. From these practices, select the appropriate ones that will improve the habitat and are otherwise appropriate for wild turkeys in the area described above.

You should not mark the box for the wildlife management practice (WMP) number 2 because there are no open areas. You would check WMP 5, because prescribed burning is commonly practiced in stage 6 woodland to promote herbaceous vegetation in the understory. Because the area is all stage 6, you would not check WMPs 6 or 9. You do not have information on population status, so you cannot check WMPs 8, 16, or 46. However, you need to know the current status – to better manage for wild turkeys – so you would check WMP 12. This area does not have any agriculture (remember, it is all stage 6), so WMPs 14 and 41 do not apply. If there are livestock on the area (in the woods), you would check WMP 17. You would plant food plots, WMP 19, because food plots are maintained as annual or perennial openings, and wild turkeys require open areas. You would mark WMP 20, because there are no openings present and fields of native warm-season grasses would provide brooding habitat and possible nesting habitat. There are plenty of trees already, so WMPs 21 and 22 are not needed. Do not check WMPs 33, because you do not have information about any streams, lakes or wetlands. You would mark WMPs 42 and 43, because there are no openings at present, and based on turkey habitat requirements, they need only one-third to two-thirds of the area in stage 5 or 6 of succession. Mark WMP 45 because wild turkeys will make use of free-standing water when available and you are not aware of the availability of water sources. So, with the information given, the boxes marked would be WMPs 5, 12, 19, 20, 42, 43 and 45.

Scorecard
A & B

Scorecard A & B

Contestant Number _____ Group _____

ON-SITE HABITAT MANAGEMENT RECOMMENDATIONS *(20 points)*

Instructions: For each species, mark an "X" for the appropriate WMP (s) needed to improve the area for that species. Consider each species separately. Do not consider cost for any land management objectives. Assume that (1.) all species are present on the area (except aquatic species if streams, ponds or lakes are absent) and (2.) this area is large enough to support all listed species.

	SPECIES			
WILDLIFE MANAGEMENT PRACTICES	**1**	**2**	**3**	**4**
2. Brush chopping (mowing)				
3. Brush piles				
5. Controlled (prescribed) burning				
6. Corridors				
8. Decrease bag/creel/season limit				
9. Disking				
10. Fertilize ponds				
12. Fish (pond) or wildlife survey				
14. Grain, leave unharvested				
16. Increase bag/creel/season limit				
17. Livestock grazing management				
18. Nesting boxes/structures/platforms				
19. Plant food plots				
20. Plant grass and forbs				
21. Plant mast trees				
22. Plant trees or shrubs				
23. Ponds/lake, artificial reefs				
24. Ponds, clear muddy water				
25. Pond construction				
26. Ponds, diversion ditches				
27. Ponds, deepen edges				
28. Ponds, remove trees near dike				
29. Ponds, repair spillway				
30. Ponds, reseed watershed/filter strips				
31. Ponds, restock				
32. Ponds, stop leaks				
33. Riparian buffers				
34. Roosting platforms/perching poles				
36. Small dikes, for temporary flooding				
37. Snags, dead, down woody material				
41. Tillage, eliminate in fall				
42. Timber harvest, clear-cut				
43. Timber harvest, selective cut				
44. Water control structures				
45. Water development for wildlife				
46. Wildlife damage management				
NUMBER CORRECT				
NUMBER INCORRECT				

Scoring = [Total Correct (-) Total Incorrect] divided by (144 - Sr.) or (72 - Jr.) X 20 = **Score**

Activity
C - 1

Activity C - I

Interpreting Wildlife Habitat from Aerial Photographs

Activity C - I (worth 25 points) involves using aerial photographs to judge the quality of an area for different wildlife species. An example of the scorecard that is used for Activity C -I can be found in this section. You will be given a list of wildlife species, and asked to rank each photograph in relation to habitat needs of these species. You should write down the species on the scorecard in the space provided. The photographs are ranked by number from left to right starting with the best for each species on the scorecard. Consider only the area that is outlined. Do not consider the surrounding area outside the outlined area. Rank the photographs one species at a time, then mark an "X" in the box that corresponds to your ranking. All possible combinations are listed, and only one box in each column should be marked under each species.

When looking at aerial photographs, imagine how the countryside should look if you were a bird flying over. If you have flown in an airplane, you know how it looks. The way a bird or pilot sees land is the way it appears on an aerial photograph. For example, a silo appears round, buildings look like squares or rectangles, woods are rough and fields are smooth.

When reading aerial photographs, hold them so that shadows of objects fall toward you. Otherwise, valleys appear as ridges, and visa versa. All objects are small, but you can determine what they are by comparing their size with the size of a known object. Other things that help are tone (shades of gray), shape and shadow. The length of shadow indicates the height of an object. The tone varies with the season or the year, so it is important to know the season when aerial photographs were made.

Most photographs used in judging events are made by the U. S. government, and the date the photograph was taken is usually in the upper left corner. The scale of such photographs can vary, but often either 4 or 8 inches on the map equals 1 mile on the ground.

Interspersion Index

As discussed in the *Concepts* section, many wildlife species prefer areas with high interspersion of lands in different successional stages. It is important to consider the amount of interspersion when ranking aerial photographs. One way of measuring the amount of interspersion of a photo are is to apply the "interspersion index" principle. This can be done by counting the number of times the habitat changes along an imaginary north-south line across the widest part of the photo, then along the widest east-west line of the photo. Next, add these two numbers together to get an interspersion index value. Compare this value with the other three photos to be judged. The higher the value, the better for quail, rabbits and other wildlife species that like areas with high interspersion.

The interspersion indexes for the four areas shown on the aerial photographs are:

Photo	Interspersion Index
1	18
2	13
3	4
4	0

Aerial Photos

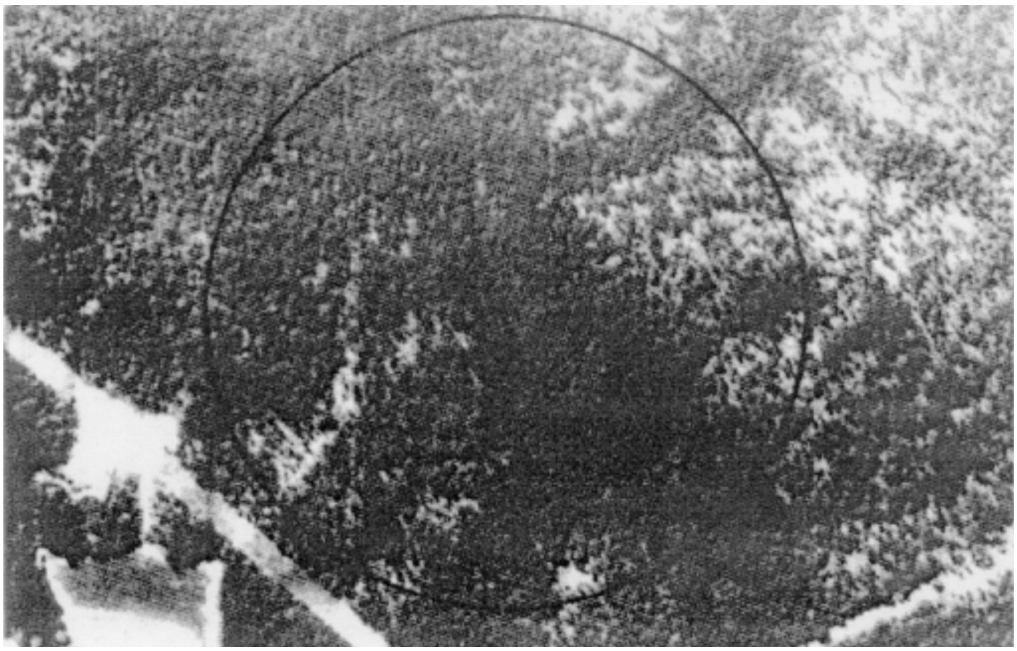


Photo 1 — Area 1

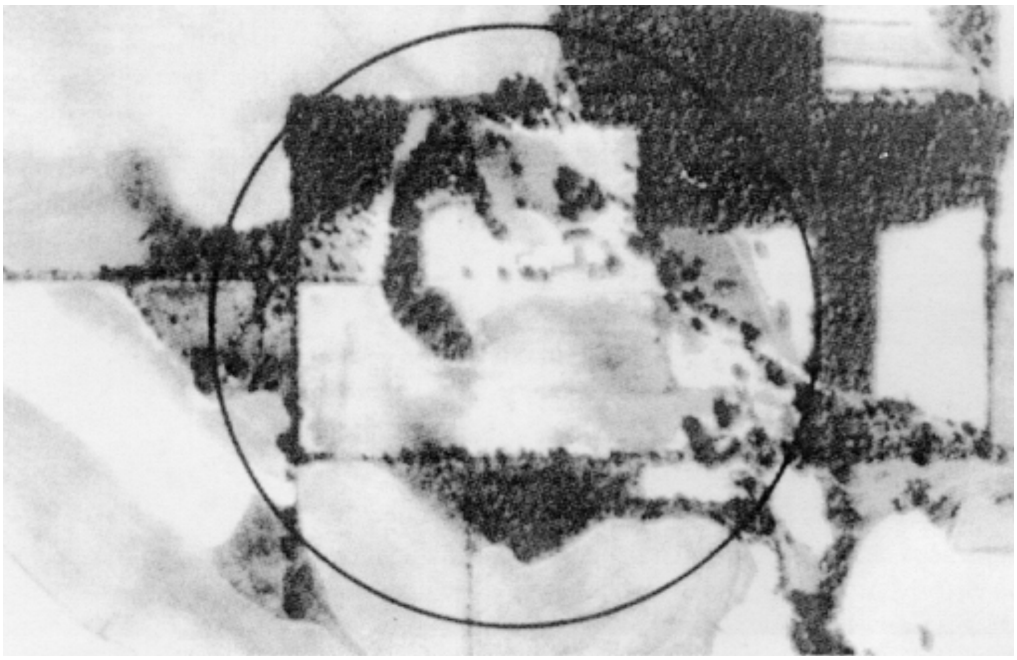


Photo 2 — Area 2

Aerial Photos

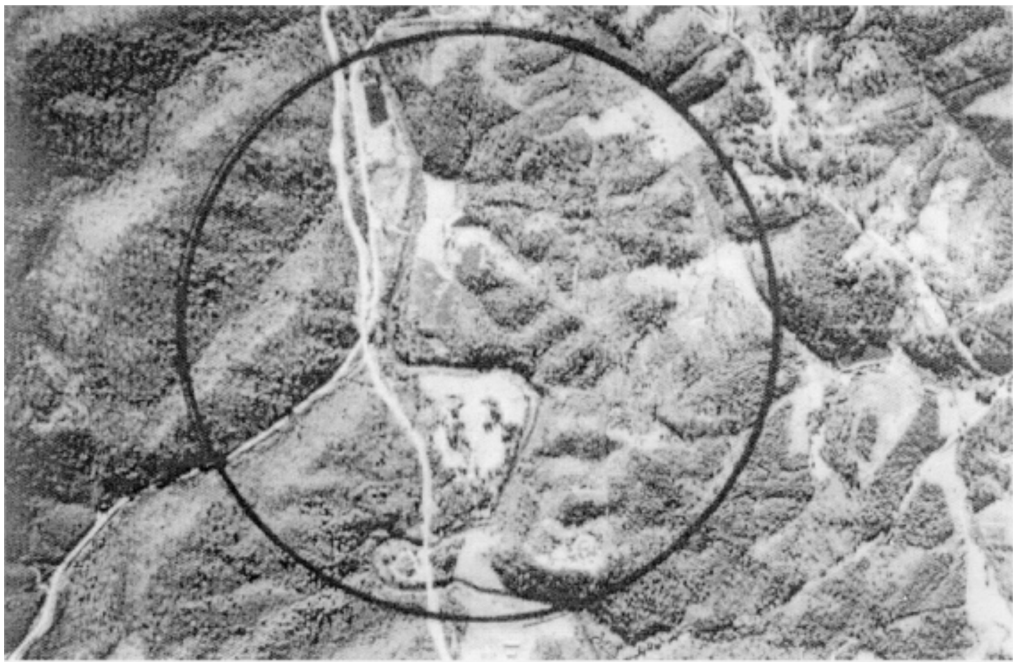


Photo 3 — Area 3

Photo 4 — Area 4

For American kestrels, the areas would be ranked 2, 3, 4, 1. These birds prefer large open areas in stages 2 and 3 of plant succession interspersed with areas in stages 4, 5, and 6 of plant succession. **Area 2** fits this well. **Area 3** also supplies this type of habitat, but has less area in stage 2 or 3 of plant succession and is rated lower than area 2. **Area 4** has large open areas, but has little interspersion of other plant succession stages and is ranked third. **Area 1** does not have any open areas and thus is ranked last.

Brown thrashers would prefer the areas in the order 3, 2, 1, 4. Thrashers prefer dense shrub thickets. **Area 3** supplies the greatest amount of this type of habitat. **Area 2** has more area in stage 4 of plant succession than either area 1 or 4. Areas 1 and 4 are difficult to judge. In this instance, we would assume there is more shrub cover associated with the woodland area in **Area 1** than what is shown in **Area 4.**

Bluebirds would prefer the areas in the order 4, 2, 3, 1. They like to nest in tree cavities adjacent to open fields and prefer open fields for feeding.

Doves also would prefer the areas in the order 4, 2, 3, 1. Since doves prefer open fields for feeding, this rating order is based on the amount of open fields available.

For cottontails, the area should be rated 2, 3, 4, 1. **Area 2** is preferred because it has nearly the proper ratios of habitat components for rabbits (one-third grassland, one-third cropland, and one-third shrub cover), and they are well interspersed (mixed together). **Area 3** doesn't have enough grass or cropland and too much cover, but it has more habitat variety than area 4. **Area 4** is lacking interspersion but has more habitat diversity (different kinds of habitat) than **Area 1.**

These areas would be rated 1, 3, 2, 4 for squirrels, hairy woodpeckers and ovenbirds. This is based simply on the amount of stage 5 and 6 deciduous woodland available.

For bobwhite quail, the areas would be ranked 2, 3, 4, 1 – the same as for rabbits. The reasons are similar in this case. However, in some judging instances, areas may be rated differently for quail than for rabbits. For example, quail do not need quite as much shrub cover as rabbits.

Raccoons would prefer the areas in order 3, 4, 2, 1. **Areas 3** and **4** both have streams that attract raccoons. **Area 3** is ranked ahead of 4, since it has more shrubs and trees along the stream. **Area 2** is ranked ahead of **Area 1** because of the interspersion of areas in different successional stages.

For ruffed grouse, the areas would be ranked 3, 1, 2, 4. Ruffed grouse need successional stages 4, 5, and 6 interspersed together. **Area 3** supplies the greatest amount of this type of habitat. **Area 1** lacks interspersion, but has more stage 5 and 6 vegetation than either 2 or 4. **Area 2** is ranked ahead of **Area 4** because of the amount of stage 4, 5, and 6 vegetation.

For turkeys, the areas would be listed 3, 2, 1, 4. According to the *Wildlife Species* section, turkeys need one-fourth to one-half of their range open, and one-half to three-fourths mature woodland. **Area 3** is preferred because it has roughly one–half the area in mature woodlands, and nearly one-fourth the area is open. **Area 2** is second, as it has both open areas and mature woodland. However, it does not meet the mature woodland requirement as well as area 3. **Area 1** is ranked third because it has more timber than area 4 and more cover in general. Due to the absence of woodland, it is doubtful if **Area 4** could support a turkey population.

For deer the area would be rated 3, 2, 1, 4. Deer prefer woodland areas interspersed with areas in various stages of succession. **Area 3** fits this well; it includes 3 stages. **Area 3** is ranked ahead of 2 since it has more successional stages and interspersion of the various stages. **Area 2** is selected over area 1 because of the variety of succession. **Area 4** is too open, so **Area 1** is picked third and 4 is last.

Wood ducks would prefer the order 3, 4, 1, 2. **Area 3** has ponds and better cover along is streams than **Area 4.** Because **Areas 1** and **2** have no ponds or streams, there is no difference between them; therefore, a minimum cut of 1 will be used.

Bass and bluegill would prefer the areas in the order 3, 4, 1, 2. Only **Area 3** has ponds. **Areas 3** and **4** have streams, so they are preferred over **Areas 1** and **2.**

Scorecard
C - I

Scorecard C-1

Contestant Number _____ Group _____

HABITAT EVALUATION FROM AERIAL PHOTOGRAPHS *(25 points)*

Instructions: For each species, rank the areas outlined on the photographs **best to worst** for their habitat value. (*Example:* 3 4 2 1). Mark an "X" in the box for the appropriate ranking. Mark only one box per species. Do not consider potential of the area – only present quality. Also, do not consider surrounding areas – only areas outlined.

	WILDLIFE SPECIES				
PHOTOGRAPH RANKING	1	2	3	4	5
1 2 3 4					
1 2 4 3					
1 3 2 4					
1 3 4 2					
1 4 2 3					
1 4 3 2					
2 1 3 4					
2 1 4 3					
2 3 1 4					
2 3 4 1					
2 4 1 3					
2 4 3 1					
3 1 2 4					
3 1 4 2					
3 2 1 4					
3 2 4 1					
3 4 1 2					
3 4 2 1					
4 1 2 3					
4 1 3 2					
4 2 1 3					
4 2 3 1					
4 3 1 2					
4 3 2 1					
Subtotals					

TOTAL _____

Activity
C - II

Activity C - II

Oral Reasons from Aerial Photograph Interpretations

Activity C-II (worth 10 points) involves giving an oral presentation before a judge, demonstrating an understanding of the aerial photographs and a rankings. Each participant in the state contest is required to give oral reasons for one species used in Activity C-I. They will be told which species to consider so they can make notes while studying the photographs. Practice photographs and examples on how to rank them for various wildlife species is located in the Activity C - I section.

This activity is judged subjectively by a contest official. The contestants' oral reasons are judged based on ranking of photo interpretation, knowledge of species, use of wildlife terms and concepts and presentation, poise and appearance. Contestants give oral reasons to a judge on why they ranked the aerial photograph for the species under consideration. Oral reasons should be short and concise. Even when an incorrect order for the photograph is selected, it is possible to score well by giving logical and concise reasons. When explaining reasons for their choices to the judge, contestant should:

- stand up straight
- remove hat, do not chew gum
- make eye contact with the judge and be enthusiastic
- identify them self and the species they are addressing
- refer to notes only occasionally (Juniors, 5^{th} - 8^{th} graders, are allowed to make maximum use of their notes)
- state reasons in terms of concepts and habitat requirements
- summarize at the end with species name and restating the placing

Preparing and Giving Reasons

Giving reasons for your decisions is an important part of 4-H Wildlife Judging. When you explain your placing, you are giving reasons. You will need to:

- Have a clear picture of each photograph in your mind
- Know the needs or requirements for the species being judged
- Be able to compare the good and poor points for each choice
- Make notes and study them before giving reasons

Example:

All contestant will be shown four aerial photographs and asked to rank the photos best to worst for several species. Each photo is identified by numbers, one through four (1-4). One species will be identified as a reasons class. For the purposes of explaining note taking and giving reasons, we will use a class of Wild Turkey. We will place them 3-1-4-2 with photo 3 having the best habitat for Wild Turkey and photo 2 having the poorest.

Making Notes

Your reasons will be easier to develop if you follow an orderly system. Begin by making good notes. They should be short, simple and easy to use. **Notes must be taken on a blank sheet of paper during a contest.** Start by selecting and listing your top pair of photos, the middle pair and the bottom pair (3/1, 1/4, 4/2 – using the example above). Create columns for each pairing as to why each is better than the next, why they are equal (admits or grants) and why the each is not as good as the next (faults).

	Reason for Placing	Admits or Grants	Faults
3/1			
1/4			
4/2			

Giving Reasons

There is a basic format for giving reasons. This format helps you organize your thoughts for presenting reasons and helps the person listening to the reasons. The following four steps will help you plan your reasons:

1. OPENING STATEMENT: Give the name of the class and the order of placing. *Example:* "I placed this class of aerial photographs for Wild Turkeys, 3-1-4-2."
2. GENERAL STATEMENT: Give a general impression of the class. *Example:* "This was a somewhat difficult class to judge, with a close middle pair and an obvious bottom photo."
3. EXPLANATION OF REASONS: Tell why one choice was placed over the next. Explain the major differences between pairs, the top pair, the middle pair and the bottom pair. This should include reason for placing, admits or grants and any faults. Be specific, use comparative terms and follow a logical order.
4. CLOSING STATEMENT: Repeat the opening statement, but begin with "therefore" or "for these reasons." *Example:* " Therefore, I place this class of photos for Wild Turkeys, 3-1-4-2.

Scorecard

An example of the reasons scorecard that is used for Activity C - II can be found on page 131.

Oral Reasons Scorecard C-II

Scorecard C-II

Contestant Number _____ Group _____

ORAL REASONS — AERIAL PHOTO INTERPRETATION *(10 points)*

Instructions: Oral reasons are judged on the criteria below. They should be short and concise. Even when an incorrect order for the photographs is selected, it is possible to score well by giving logical and descriptive reasons. The use of notes is allowed but not excessively for Seniors and unrestricted for Juniors. Judges may use whole, half or quarter points when judging. All contestants should receive a minimum of 4 points, total.

Oral Reasons Presentation Contestant Ranking: _____		
Logic or ranking and photo interpretation	(4 points)	
Knowledge of species	(2 points)	
Use of Wildlife Concepts	(2 points)	
Presentation, poise and appearance	(2 points)	
	TOTAL	
Judge:		

Activity D

Activity D

Identifying Common Wildlife Foods

Activity D (worth 15 points) involves identifying foods used by wildlife and matching those foods to the wildlife species or group that eat them. A list and tables of foods commonly used by certain wildlife species or groups is shown on the following pages. Since most species of wildlife occasionally eat unusual things if they happen upon them by chance, this list is not entirely complete. All species in a certain wildlife group do not eat all foods listed for that wildlife group. For example, all turtles do not eat fruit. Some species eat fruit and not mussels, and others eat mussels and not fruit. Likewise, wildlife do not eat all species in a certain food group. For example, deer do not eat tender twigs and leaves from all trees and shrubs - only from certain species.

For purposes of our judging event, if any species in a wildlife group commonly eats any species in a food group, the food group should be marked for the appropriate wildlife group.

In the judging event, each food item shown is assigned a number. **Seniors** – The participant marks an "X" in the appropriate box for each wildlife group that may eat the numbered food item. **Juniors** – The participant marks an "X" in the appropriate box identifying the numbered food item. During an event, food items may be shown to contestants with pictures, plant parts, growing plants, or mounted specimens and/or live animals.

Example:

The judge has brought a persimmon tagged with the number 7. This would be classified as a fruit and marked as such for **Juniors**, and the appropriate box for **Senors** is each wildlife group that eats fruit. Seniors should mark bats, bluebirds, butterflies, ducks, deer, foxes, grouse, marten, quail, rabbits, sparrows, squirrels, thrashers, turkeys, turtles, wapiti (elk), and woodpeckers. To verify for your self, check the foods tables. All species of turtles do not eat fruit. But remember, if any species of turtle eats fruit, column 7 should be marked for turtles.

Note: Not all species mentioned in the Wildlife Species section of this manual are listed on the food chart. Likewise, not all wildlife species listed on the foods chart are included in the Wildlife Species section. The reason for this is that not all species included on the foods chart are found in Georgia (e.g., Wapiti, elk). **Seniors** will be expected to identify foods for all the wildlife species listed on the foods chart at the state contest.

Example — List of Wildlife Foods

Bass:	Birds (ducklings), crayfish, earthworms, fish, frogs and salamanders, insects, mammals, salamanders, snails, snakes, spiders, turtles
Bats:	Fruit, insects
Beaver:	Aquatic plants (roots), bark, buds, forbs (greens), leaves and twigs
Bluebirds:	Earthworms, fruit and berries, insects, seeds, spiders
Bluegill:	Crayfish, earthworms, fish, insects, spiders
Butterflies:	Fruit and berries, nectar from flowers
Deer:	Aquatic plants, bark, buds, ferns, forbs (greens), fruit and berries, fungi, grain, grass, leaves and twigs, lichens, nuts (including acorns), seeds (sumac)
Doves:	Grain, seeds
Ducks:	Aquatic plants, crayfish, earthworms, fish, frogs and salamanders, fruit and berries, grain, insects, nuts (including acorns), seeds, snails, tubers
Foxes:	Birds, carrion, crayfish, earthworms, eggs, frogs and salamanders, fruit and berries, insects, lizards, mammals (rats, mice, and rabbits), snakes
Frogs:	Crayfish, earthworms, frogs and salamanders, insects, snails, snakes, spiders, turtles
Grouse:	Buds, earthworms, forbs (greens), fruit and berries, grain, grass, insects, leaves and twigs, nuts (including acorns), seeds, spiders
Hawks:	Birds, carrion, crayfish, fish, frogs and salamanders, insects, lizards, mammals (rats, mice, rabbits, squirrels), snakes
Lizards:	Birds, eggs, insects, lizards, mammals (mice), scorpions, snails, snakes, spiders
Marten:	Birds, eggs, fish, frogs and salamanders, fruit and berries, insects, mammals (small)
Mink:	Birds, crayfish, eggs, fish, frogs and salamanders, insects, mammals (small)
Moles:	Centipedes and millipedes, earthworms, insects, snails
Otter:	Birds, crayfish, eggs, fish, frogs and salamanders, mammals (small), mussels
Owls:	Birds, insects, lizards. mammals (small), snakes
Pronghorn:	Buds, forbs (greens), grass, leaves and twigs
Quail:	Earthworms, forbs (greens), fruit and berries, grain, insects, nuts (including acorns), seeds, spiders
Rabbits:	Bark, buds, forbs (greens), fruit and berries, grain, grass, leaves and twigs, seeds
Salamanders:	Centipedes and millipedes, earthworms, insects, snails
Shrews:	Earthworms, frogs and salamanders, insects, mammals (small), snails
Snakes:	Birds, crayfish, earthworms, eggs, fish, frogs and salamanders, insects, mammals (small), snakes, turtles
Sparrows:	Buds, earthworms, forbs (greens), fruit and berries, insects, seeds, spiders
Squirrels:	Bark, buds, eggs, fruitand berries, fungi, grain, insects, leaves and twigs, nuts (including acorns), seeds
Thrashers:	Earthworms, fruitand berries, insects, seeds, spiders
Trout:	Crayfish, earthworms, eggs, fish, insects, snails, spiders
Turkeys:	Buds, centipedes and millipedes, earthworms, forbs (greens), fruit and berries, fungi, grain, grass, insects, leaves and twigs, Nuts (including acorns), seeds, snails, snakes, spiders, tubers
Turtles:	Aquatic plants, birds, carrion, crayfish, fish, forbs (greens), fruit and berries, insects, mussels, spiders
Wapiti (Elk):	Bark, buds, forbs (greens), fruit and berries, fungi, grain, grass, leaves and twigs, tubers
Warblers:	Earthworms, insects, spiders
Woodpecker:	Fruit and berries, grain, insects, nuts (including acorns), seeds, spiders
Wrens:	Centipedes and millipedes, earthworms, insects, spiders

Wildlife Foods (table 1) *Wildlife*	Bass	Bats	Beaver	Bluebirds	Bluegill	Butterflies	Deer	Doves	Ducks	Foxes	Frogs	Grouse	Hawks	Lizards	Marten	Mink	Moles	Otters
Aquatic plants			X				X		X									
Bark			X				X											
Birds	X									X			X	X	X	X		X
Buds			X				X					X						
Carrion										X			X					
Centipedes and millepedes																	X	
Crayfish	X				X				X	X	X		X			X		X
Earthworms	X			X	X				X	X	X	X					X	
Eggs										X				X	X	X		X
Ferns							X											
Fish	X				X				X				X		X	X		X
Forbs (greens)			X				X					X						
Frogs and salamanders	X								X	X	X		X		X	X		X
Fruit and berries		X		X		X	X		X	X		X			X			
Fungi							X											
Grain							X	X	X			X						
Grass							X					X						
Insects	X	X		X	X				X	X	X	X	X	X	X	X	X	
Leaves and twigs			X				X					X						
Lichens							X											
Lizards										X			X	X				
Mammals (small)	X									X			X	X	X	X		X
Mussels																		X
Nectar from flowers						X												
Nuts (including acorns)							X		X			X						
Scorpions														X				
Seeds				X			X	X	X			X						
Snails	X								X		X			X			X	
Snakes	X									X	X		X	X				
Spiders	X			X	X						X	X		X				
Tubers									X									
Turtles	X										X							

Wildlife Foods (table 1 continued) *Wildlife*	Owl	Pronghorn	Quail	Rabbits	Salamanders	Shrews	Snakes	Sparrows	Squirrels	Thrashers	Trout	Turkeys	Turtles	Wapiti (Elk)	Warblers	Woodpeckers	Wrens
Aquatic plants													X				
Bark				X					X					X			
Birds	X						X						X				
Buds		X		X				X	X			X		X			
Carrion													X				
Centipedes and millepedes					X							X					X
Crayfish							X				X		X				
Earthworms			X		X	X	X	X		X	X	X			X		X
Eggs							X		X		X						
Ferns																	
Fish							X				X		X				
Forbs (greens)		X	X	X				X				X	X	X			
Frogs and salamanders						X	X										
Fruit and berries			X	X				X	X	X		X	X	X		X	
Fungi									X			X		X			
Grain			X	X					X			X		X		X	
Grass		X		X								X		X			
Insects	X		X		X	X	X	X	X	X	X	X	X		X	X	X
Leaves and twigs		X		X					X			X		X			
Lichens																	
Lizards	X																
Mammals (small)	X					X	X										
Mussels													X				
Nectar from flowers																	
Nuts (including acorns)			X						X			X				X	
Scorpions																	
Seeds			X	X				X	X	X		X				X	
Snails					X	X					X	X					
Snakes	X						X					X					
Spiders			X					X		X	X	X	X		X	X	X
Tubers												X		X			
Turtles							X										

DEFINITIONS OF WILDLIFE FOOD CATEGORIES

Aquatic Plants - will include only specimens from the following plant groups: Sedges *Carex* spp., Rushes *Juncus* spp., Rushes *Scirpus* spp., Cattail *Typha* spp. Milfoils *Myriophyllum* spp., Coontails *Ceratophyllum* spp., Duck Weeds *Lemna* spp., Pond Weed *Potamogeton* spp., Water Weeds *Elodea* spp., Arrowhead/Duck Potato *Sagittaria* sp., Water Primrose Seed Box *Ludwigia* spp., Smart Weed *Polygonum* spp., Arrow Arum *Peltandra* spp.

Bark – the outer covering of the woody stems, branches, roots and main trunks of trees and other woody plants as distinguished from the cambium and inner wood

Birds – a member of the class Aves, which includes warm blooded, egg laying vertebrates with forelimbs that form wings

Buds – a small swelling on a stem or branch, often enclosed in protective scales, containing undeveloped shoots, leaves, or flowers

Carrion – stinking, rotten, flesh; may have insect larvae present

Centipedes & Millipedes – any of various wormlike arthropods having numerous body segments, each with two or four legs per segment

Crayfish – any of various freshwater crustaceans resembling a lobster but considerably smaller

Earthworms – a round, segmented worm that borrows in the soil

Eggs – one of the female reproductive cells of various vertebrate animals, consisting usually of an embryo surrounded by nutrient material with a protective covering

Ferns – any of numerous flowerless, seedless vascular plants, characteristically having fronds with divided leaflets and reproducing by means of spores

Fish – any of numerous cold blooded aquatic vertebrates, characteristically having fins, gills and usually scales

Forbs (greens) – low growing herbaceous plants (other than grasses), both annual and perennial; can be shown with or without flowers

Frogs & Salamanders – any chiefly aquatic amphibians, characteristically having smooth moist skin, webbed feet and long hind legs adapted for leaping; lizard like amphibians having porous scaleless skin and four rudimentary legs

Fruit & Berries – soft, fleshy, pulp - covered seeds

Fungi -- a group of plants having no leaves, flowers or green color and reproduces by spores, including the yeasts, molds, smuts and mushrooms

Grain – cereal grains for human consumption (includes wheat, oats, rye, barley, rice, corn) all other commercially grown crops are considered seeds except fruits and mast species (nuts)

Grass – plants typically having long narrow leaves with parallel veins and hollow jointed stems, flowers are inconspicuous and often in clusters

Insects – any of a large group of small invertebrate animals having an adult stage characterized by three pairs of legs, a segmented body with three major parts and usually two pair of wings

Leaves & Twigs – a usually flattened structure of vascular plants, characteristically consisting of blade-like expansions attached to a stem; a small branch or slender shoot from a tree and shrub

Lichens – any of a group of moss-like plants consisting of algae and fungi growing in close association

Lizards – any of numerous reptiles, characteristically having an elongated, scaly body, four legs and a tapering tail

Mammals – vertebrate animals that are distinguished by self-regulating body temperature, hair and producing milk for their young

Mussels – any of a group of bivalved invertebrates characterized by a soft, unsegmented body enclosed in most cases by a calcareus shell

Nector – a sweet liquid secreted by flowers of various plants, but represented by a flower by itself, in our contest

Nuts (including acorns) – a hard shelled, solid textured, one celled fruit such as walnuts, hickory nuts, acorns, beechnuts, pecans, hazel nuts and almonds

Scorpions – any of the Arachnids having a segmented body and an erectile tail tipped with a venomous sting

Seeds – the part of a flowering plant that contains the embryo capable of germinating to produce a new plant; for this contest they are not fleshy, are not acorns or nuts or grain

Snails – any of numerous mollusks characteristically having a protective spiral shell, a broad retractile foot and a distinctive head

Snakes – any of various scaly, legless reptiles with tapering tails, some may be venomous

Spiders – any Arachnids having eight legs, a body divided into two parts and several spinnerets that produce silk used to make nests, cocoons or webs

Tubers – a swollen, fleshy, starchy end of an underground side shoot or stem, distinguished by buds from which new plant shoots arise

Turtles – any reptile having a horny toothless jaws and the body enclosed in a bony or leathery shell into which head, legs and tail can be withdrawn

Scorecard D
Junior

Scorecard D - Juniors

Contestant Number _____ Group _____

Identifying Common Wildlife Foods (15 points)

INSTRUCTIONS: Identify the food items displayed and mark an "X" in the appropriate box. Food items might be displayed more than once.

Wildlife Food Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Aquatic plants															
Bark															
Birds															
Buds															
Carrion															
Centipedes and millepedes															
Crayfish															
Earthworms															
Eggs															
Ferns															
Fish															
Forbs (greens)															
Frogs and salamanders															
Fruits and berries															
Fungi (mushrooms)															
Grain															
Grass															
Insects															
Leaves and twigs															
Lichens															
Lizards															
Mammals (small)															
Mussels															
Nectar from flowers															
Nuts (including acorns)															
Scorpions															
Seeds															
Snails															
Snakes															
Spiders															
Tubers															
Turtles															

Scoring = One point for each food item correctly identified. SCORE _____

Scorecard D
Seniors

SCORECARD D – Seniors

Contestant Number _____ Group _____

Identifying Common Wildlife Foods (15 points)

INSTRUCTIONS: For each wildlife species below, mark an "X" in the appropriate box for each food items displayed which may occur in their diet. Some species will not eat any of the food items displayed. Food items might be displayed more than once.

Wildlife Species	1	2	3	4	5	6	7	8	9	10
Bass										
Bats										
Beaver										
Bluebird										
Bluegill										
Butterflies										
Deer										
Doves										
Ducks										
Foxes										
Frogs										
Grouse										
Hawks										
Lizards										
Marten										
Mink										
Moles										
Otter										
Owls										
Pronghorn										
Quail										
Rabbits										
Salamanders										
Shrews										
Snakes										
Sparrows										
Squirrels										
Thrashers										
Trout										
Turkeys										
Turtles										
Wapiti (elk)										
Warblers										
Woodpeckers										
Wrens										
NUMBER CORRECT										
NUMBER INCORRECT										

Scoring = [Total correct (-) Total incorrect, (divided by) 350] (X) 15 = **Score**_____

Glossary

Glossary

aerate: to supply or expose water to air to increase dissolved oxygen and release harmful gases.

annual: when referring to plants, those that complete their life cycle from seed to mature seed-bearing plant in one growing season.

arid: dry, receives little precipitation.

broadleaf: a plant with wide blade leaves, such as an oak or cottonwood. Seeds are born from flowering parts in contrast to conifers which bear seeds in cones.

butte: a hill that rises abruptly from its surroundings. Sides are steeply sloped or with cliffs, and the top is nearly flat.

cacti: plants adapted to dry conditions. Often store water in leaves and other parts of the plant. Usually have small leaves and thorns.

canopy cover: the amount of ground covered by the branches, leaves, and stems of plants. Can specify as herbaceous, shrub, tree, or all canopy cover. Expressed as a percentage.

canyon: a deep, narrow gap or cleft in the earth caused historically by running water or glaciers.

coastal plain: large, nearly level areas of land near ocean shores.

competition: when two or more organisms use the same resource.

congregate: when animals group together in an area.

conifer: usually refers to needleleaf trees that bear their seeds in cones. Spruces, pines, and firs are examples.

cover: vegetation and other land features that provide areas for wildlife to hide, sleep, feed, and reproduce.

crown-sprout: the ability of some plants to regrow after plant material above ground is removed by fire or other disturbances.

cultivate: tilling or working the soil for the purpose of growing crops and other desired plants.

decadent: declining in health and/or productivity.

deciduous: plants that annually shed their leaves. Usually trees and shrubs.

dense: thick, or crowded closely together.

detrimental: having harmful effects.

dew: water droplets condensed from the air onto cool surfaces such as leaves. Usually occurs at night.

dominant: the plant or animal species that is the most noticeable and common in an area. Often are a controlling force in the community where they occur.

drought: the lack of normal precipitation for an extended period of time. A long period with little or no rain.

endangered species: a species that is in danger of becoming extinct.

environment: the surroundings that effect the growth and development of an organism. The surroundings of an organism, including other plants and animals, climate, and location.

evergreen: plants that do not loose all their leaves at one time. Usually conifer trees, but also some broadleaf trees such as live oak.

excavate: to make a cavity or hole. To hollow out.

exclusion: keeping something out of an area.

fertile: rich in material needed to support plant growth.

fluctuate: to vary, or rise and fall irregularly.

forage: refers to the vegetation eaten by animals.

fruit: fleshly fruit and berries.

glaciation: the action of huge masses of moving ice formed from compacted snow.

glean: to gather food in a systematic manner with a minimum of waste and unnecessary effort.

ground litter: layer of the forest floor consisting of decaying organic matter such as leaves, branches, and dead plants.

hardwood: deciduous or broadleaf trees.

herbicide: chemicals used to control the growth of or kill undesired plants.

insecticide: chemicals used to control insects.

interior basin: land areas that are generally bowl-shaped and surrounded by hills and mountains. Usually drained by one river system and isolated from ocean influence by mountains and hills.

invertebrate: animals lacking a backbone. Some examples are insects, spiders, mollusks, and crustaceans.

irrigate: to supply cropland, parks, yards, etc., with water through the use of diversions, ditches, and pipes.

legume: plants that bear seeds in a pod. Typically have characteristics that allow them to improve the fertility of the soil. Some examples are alfalfa, clover, soybeans, and peas.

manipulate: manage or influence to achieve desired results.

moldboard plow: a type of plow that turns the soil completely upside down, burying all crop remains underneath. Does not leave crop residue on ground surface.

nutrients: chemicals required for plants and animals to grow and exist.

peninsula: a long, narrow projection of land into water.

perennial: a plant that lives for several years. Having a life span of more than two years.

phytoplankton: microscopic floating and suspended aquatic plants. Are the first step of the food chain in many aquatic systems.

plateau: an elevated, relatively level expanse of land. Sometimes called tableland.

playa: the level area at the bottom of a closed basin that is often covered with water from rain runoff and snow melt.

regenerate: to replace lost or damaged parts with new tissue.

rejuvenate: to stimulate and return to youthful health and vigor.

riparian: on or near the bank of water areas. The land area that is influenced by the adjacent water.

secluded: removed or screened from view of other areas and disturbances.

sedge: grass-like plant with long narrow leaves, stems are round. Many species like wet areas.

shrub: plants with woody stems that are usually less than 12 feet tall. Often have many main stems rather than one main stem (trunk).

slash: the residue left on the ground after trees are harvested.

slope: the degree that the land surface is inclined.

softwood: usually refers to coniferous trees. Some deciduous trees such as aspen also have relatively soft wood.

species: animals and plants that are the same and successfully reproduce the same kind of plant or animal.

stagnant: sluggish, not producing to potential.

subclimax: a stage in succession that is short of the climax stage, but further development is inhibited by some factor(s) other than climate.

succulent: having thick fleshly leaves that conserve moisture.

terrain: the character or topography of the land.

transitional: the process of changing from one form to another.

tree: a plant that is usually more than 12 feet tall and has a single main woody stem with a distinct crown of leaves.

undulating: a regular rising and falling or side to side motion.

valley: an elongated lowland between mountains, hills, or other upland areas that often has a river or stream running through it.

vigor: in plants and animals refers to the capacity for strong growth and high survival.

waste water: the water that runs off cropland during irrigation.

zooplankton: microscopic animals that float/swim in water. Consume phytoplankton and are an important part of the aquatic food chain.

Bibliography

Bibliography

The sources listed were used in development of the handbook. Sources shown in **bold** type are likely to be found in local libraries and may be useful as additional teaching material.

Allen, A. W. 1984. *Habitat suitability index models: marten.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.11). Revised 13pp.

___. 1984. *Habitat suitability index models: gray partridge.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.73). 23pp.

___. 1986. *Habitat suitability index models: mallard* (winter habitat, Lower Mississippi Valley). U.S. Fish Wildl. Serv. Biol. Rep. 82(10.132). 37pp.

___. 1986. *Habitat suitability index models: mink.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.127). Revised. 23pp.

___. J. G. Cook, and M. J. Armbruster. 1984. *Habitat suitability index models: pronghorn.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.65). 22pp.

American Joint Committee on Horticultural Nomenclature. 1924. Standardized plant names. Harrisburg, Pa: Mount Pleasant Press. 546pp.

Bailey, R. G. 1980. *Description of the ecoregions of the United States.* U.S. Dept. of Agri., Misc. Pub. No. 1391. 77pp.

Bellrose, F. C. 1976. *Ducks, geese and swans of North America.* Second ed. Harrisburg, Pa : Stackpole Books. 544pp.

Bent, A. C. 1938. *Life histories of North American birds of prey.* Part 2. U.S. Natl Mus. Bull. 170. Washington, D.C.: U.S. Gov. Printing Off. 482pp.

___. 1939. *Life histories of North American woodpeckers.* U.S. Natl Mus. Bull. 174. Washington, D.C.: U.S. Gov. Printing Off. 334pp.

___. 1948. *Life histories of North American nuthatches, wrens, thrashers and their allies.* U.S. Natl Mus. Bull. 195. Washington, D.C.: U.S. Gov. Printing Off. 475pp.

___. et. al. 1968. *Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies.* U.S. Natl Mus. Bull. 174, Part 2: 602-1248.

___. 1968. *Life histories of North American cardinals, grosbeaks, buntings, towhees, finches, sparrows, and allies.* U.S. Natl Mus. Bull. 174, part 3: 1249-1890.

Bourne, R., and A. D. MacConomy, eds. 1974. *Gardening with wildlife*. Washington, D.C.: Natl. Wildl. Federation.190pp.

Burt, W. H., and R. P. Grossenheider. 1976. *A field guide to the mammals of North America*. Third ed. Boston: Houghton Mifflin Co. 289pp.

Cade, B. S. 1986. *Habitat suitability index models: brown thrasher.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.118). 14pp.

___, and P. J. Sousa. 1985. *Habitat suitability index models: ruffed grouse.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.86). 31pp.

Chapman, J. A., and G. A. Feldhamer. 1982. *Wild mammals of North America: Biology, management and economics.* The John Hopkins University Press, Baltimore, Md. 1147pp.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States.* U.S. Fish Wildl. Serv. FWS/OBS-79/31. 103pp.

Daubenmire, R. 1978. *Plant geography with special reference to North America.* New York: Acad. Press. 338pp.

DeGraaf, R. M., V. E. Scott, R. H. Hamre, L. Ernst, and S.H. Anderson. 1991. *Forest and rangeland birds of the U.S. Natural history and habitat use.* USDA Ag. Handbook 688.

Graves, B. M., and S. H. Anderson. 1987. *Habitat suitability index models: bullfrog.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.138). 22pp.

Griscom, L., and A. Sprunt Jr., eds. 1957. *The warblers of America.* New York: Devin-Adair Co. 356pp.

___. 1979. *The warblers of America.* Garden City, N.Y.: Doubleday & Co., Inc. 302pp.

Hammerstrom, F. N. Jr., B. E. Harrell, and R. R. Olendorff, eds. 1974. Management of raptors. Proc. Conf. Raptor Conser. Techniques, Colo. Raptor Res. Found Inc., Raptor Res. Rep. No. 2. 146pp.

Hein, D. 1972. *Selected information of life histories, distribution and ecology of small game species.* Colorado State University Text FW 470.

Henderson, F. R., ed. 1988. *Guidelines for increasing wildlife on farms and ranches: with ideas for supplemental income sources for rural families.* Manhattan, Kan.: Kansas State University.

Hoover, R. L., and D. L. Wills, eds. 1984. *Managing forested lands for wildlife*. Denver: Colo. Div. of Wildl. and U.S. For. Serv., Rocky Mountain Reg. 459pp.

Hygnstrom, S. E., R. M. Timm, and G.E. Larson. 1994. *Prevention and control of wildlife damage.* Univ. of Nebraska Coop. Ext. Serv., U.S. Dept. of Ag.-Animal and Plant Health Inspection Service-Animal Damage Control. Great Plains Agriculture Council.

Jackman, S. M., and J. M. Scott. 1975. *Literature review of twenty-three selected forest birds of the Pacific Northwest.* U.S. For. Serv. Reg. 6. 382pp.

Johnsgard, P. A. 1975. *North American game birds of upland and shoreline.* Lincoln: University of Nebraska Press. 183pp.

___. 1983. *The hummingbirds of North America*. Washington, D.C.: Smithsonian Institution Press. 303pp.

Johnson, J. R. 1984. *Who's who in Great Plains song birds.* Lincoln: University of Nebraska Extension Service Publ. Ec 84/1757. 44pp.

Jones, E. J. 1989. *National 4-H wildlife invitational manual.* 38pp.

Kilham, L. 1983. *Life history studies of woodpeckers of Eastern North America*. Cambridge, Mass.: Nuttall Ornithol. Club. 240pp.

Lagler, K. F. 1975. *Freshwater fishery biology.* Second ed. Dubuque, Iowa: Wm. C. Brown Co. Publishers. 421pp.

Lawrence, L. D. K. 1966. *A comparative life history study of four species of woodpeckers*. Ornithol. Mono. No. 5. Am. Ornithol. Union. 156pp.

Leopold, A. S. 1977. *The California quail.* Berkeley, Calif.: University of California Press. 281pp.

Martin , A. C., H. S. Zim, and A. L. Nelson. 1951. *American wildlife and plants: a guide to wildlife food habits.* New York: Dover Publ. Inc. 500pp.

Masser, M.P. 1993. *Management of Recreational Fish Ponds in Alabama*. Alabama Cooperative Extension System. Circular ANR-577. 21pp.

Messmer, T. A. 1990. *Wildlife habitat evaluation manual.* Fargo, N.D.: North Dakota State University. 35pp.

Morehead, C. A. 1990. Urban wildlife of the front range in Colorado. Unpublished ms. Colorado State University.

National Geographic Society. 1987. *Field guide to the birds of North America.* Second ed. Washington, D.C.: Natl. Geogr. Soc. 464pp.

Robbins, C. S., B. Bruun, and H.S. Zim. 1966. *Birds of North America.* New York: Golden Press. 340pp.

Satterfield, J. R. Jr., and S. A. Flickinger. 1984. *Colorado warmwater pond handbook.* Fort Collins, Colo.: Colorado State University Fisheries Bull. No. 1. 44pp.

Schemnitz, S. D. 1980. *Wildlife management techniques manual.* Fourth ed. Revised. Washington, D.C.: Wildl. Soc. 686pp.

Schmidt, J. L., and D. L. Gilbert, eds. 1978. *Big game of North America.* Harrisburg, Pa.: Stackpole Books. 494pp.

Schroeder, R. L. 1983. *Habitat suitability index models: black-capped chickadee.* U.S. Fish Wildl. Serv. Biol. Serv. Rep. 82(10.37). 12pp.

Sealander, J. A., and G. A. Heidt. 1990. *Arkansas Mammals: their natural history, classification, and distribution.* Univ. of Ark. Press, Fayetteville. 308pp.

Shelford, V. E. 1963. *The ecology of North America.* Urbana, Ill.: University of Illinois Press. 610pp.

Short, H. L. 1984. *Habitat suitability index models: Brewer's sparrow.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.83). 16pp.

___. 1985. *Habitat suitability index models: Red-winged blackbird*. U.S. Fish Wildl. Serv. Biol. Rep. 82(10.95). 20pp.

Skutch, A. F. 1973. *The life of the hummingbird.* New York: Crown Publishers, Inc. 95pp.

Smith, D. R., ed. 1975. *Proc.* of the symposium on management of forest and range habitats of non-game birds. U.S. For. Serv. Gen. Tech. Rep. WO-1. 343pp.

Sousa, P. J. 1987. *Habitat suitability index models: hairy woodpecker.* U.S. Fish Wildl. Serv. Biol. Rep. 82(10.146). 19pp.

Thomas, J. W., ed. 1979. *Wildlife habitats in managed forests the Blue Mountains of Oregon and Washington.* U.S. For. Serv., Agri. Handbook No. 553. 512pp.

Trimble, S. 1975. *Non-game birds of the west, the ecology and life histories of Seven Orders*. Denver: U. S. Dept.. Int., Bur. of Land Manage. 320pp.

Verner, J., and A. S. Boss, technical coordinators. 1980. *California wildlife and their habitats: western Sierra Nevada.* Berkeley, Calif.: U. S. Dept. of Agri., For. Serv. Gen. Tech. Rep. PSW-37. 439pp.

Whitmore, W. C. 1979. *Temporal variation in the selected habitats of a guild of grassland sparrows.* Wilson Bull. 91:593-598.

Whittaker, R. H. 1975. *Communities and ecosystems.* Second ed. New York: Macmillan Publishing Co., Inc. 385pp.

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State Program Leader – 4-H

4-H & Youth Development

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