

Wood Duck

(Aix sponsa)

Fish and Wildlife Habitat Management Leaflet



General Information

The wood duck is considered by many bird watchers to be North America's most colorful waterfowl species. Its scientific name, *Aix sponsa*, translates into "waterbird in bridal dress." Today the wood duck is one of the most common waterfowl species breeding in the United States. However, this was not always the case. Writings from the early 19th century indicate that wood ducks were in abundant supply and very popular for their tasty meat and bright decorative feathers. By the late 1880's, unregulated hunting and destruction of

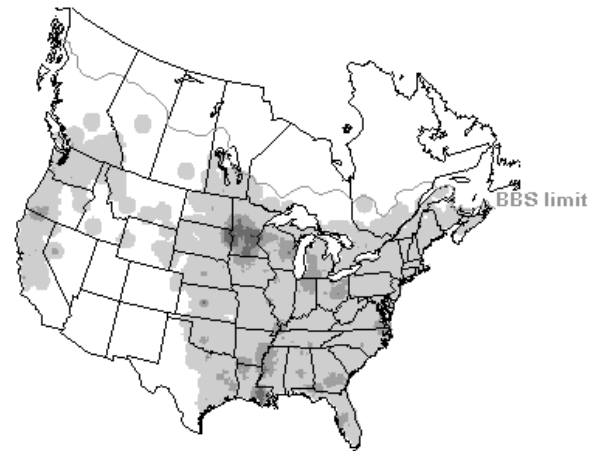
woodland and wetland habitat had caused the wood duck population to decline to alarmingly low levels. By the beginning of the 20th century, wood ducks had virtually disappeared from much of their former range.

In response to the Migratory Bird Treaty established in 1916 and enactment of the Federal Migratory Bird Treaty Act in 1918, wood duck populations began to slowly recover. By ending unregulated hunting and taking measures to protect remaining habitat, wood duck populations began to rebound in the 1920's. The development of the artificial nesting box in the 1930's gave an additional boost to wood duck production. Wood ducks eagerly accepted boxes as suitable nesting sites, and over the following fifty years, conservation groups and individuals helped increase numbers of wood ducks by preserving habitat and erecting nest boxes. The combination of hunting restrictions and habitat conservation and management measures enabled wood duck populations to rebound enough to support conservative hunting in the 1940's. The story of the wood duck is an example of how active wildlife management techniques can have a tremendous effect on the overall success of an individual species.

This pamphlet is designed to serve as an introduction to the habitat requirements of the wood duck and to assist in the development of a comprehensive wood duck management plan. The success of any individual species management plan depends on targeting the specific needs of the species and analyzing the designated habitat areas as a whole to ensure that all habitat requirements are present. This guide also provides recommendations for monitoring the program to ensure successes are documented and problems are addressed before they impact the success of the overall management plan.

Range

The wood ducks' range extends on the east coast from Nova Scotia west to the north central U.S. and south to Florida and the Gulf of Mexico. Birds nesting in New England winter in the Atlantic states from the Carolinas southward. Midwestern wood ducks winter in the area extending from Georgia west to Texas. On the west coast, the wood ducks' range extends from British Columbia



Breeding Range

south to the Mexican border. Upper west coast wood ducks will winter in southern California and the Mexican Pacific coast. Southern breeding wood ducks are year-round residents. Fall migration generally begins in October and extends into November. Spring migration occurs during March and April. Wood ducks migrate either in pairs or in small flocks. Wood ducks respond well to habitat protection and restoration activities, and breeding pairs are increasing use of suitable habitat outside traditional breeding areas.

Habitat Requirements

General

Wood ducks nest in woodland areas along lakes, rivers, and vegetated wetland areas. During the winter months, wood ducks inhabit bottomland hardwood wetlands, beaver ponds and flowages, river oxbows, meanders and backwaters, and other inland freshwater forested wetland areas. Habitat areas chosen by wood ducks are commonly used by other waterfowl species such as black ducks, hooded mergansers, and ring-necked ducks. High-quality wood duck habitat is intricately linked to preservation and management of old growth timber along river corridors and availability of nesting sites. Although wood duck populations have recovered,

the largest threat to their future is the continued loss of habitat. By protecting and restoring floodplain timber, river oxbows and meanders, and other freshwater wetland and riparian habitats, landowners can assist in the continued success of wood ducks and other migratory waterfowl species that rely on similar habitats.

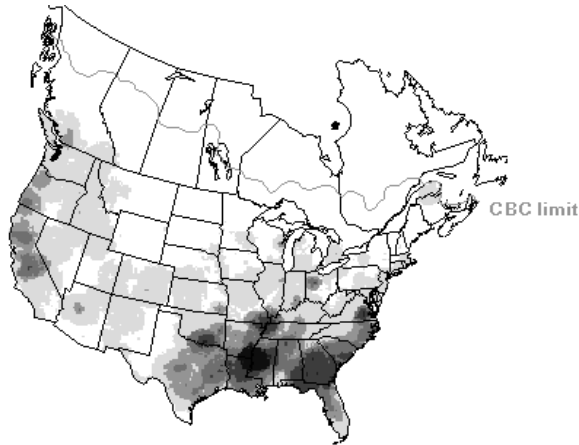
Food

Food for young birds and adults differs dramatically. The early diet of ducklings consists largely of insects, aquatic invertebrates, small fish, and other high-protein animal material. After six weeks of age, the young switch to plant foods until their diet consists of approximately 90 percent vegetative material, primarily aquatic plants such as algae, watermeal, watershield, sago pondweed, and duckweed. Adult wood ducks feed on a variety of nuts and fruits, aquatic plants and seeds, and aquatic insects and other invertebrates. Insects and aquatic invertebrates are particularly important food items of adult hens during egg laying in spring. Acorns and other forest mast are important fall and winter foods. While acorns are the primary winter foods, the seeds of bald cypress, hickory, sweet gum, buttonbush, arrow-arum, bur-reed, and wild rice are also common winter foods. Wood ducks feed primarily in shallow water areas, but will also forage on the forest floor for seeds, acorns, and nuts.

Important wood duck food plants. The following species are known to be important food items in the diet of wood ducks. Those species in bold print are of particular value for their usefulness as a winter food source.

oak (acorns)	hickory (nuts)	elm	bald cypress	beech (nuts)	sweet gum	bulrush
ash	button bush	maple	blackgum	bur-reed	rice cutgrass	pondweed
arrow-arum	wild rice	sedge	smartweeds	barnyard grass	nightshade	watershield
cowlily	beggarticks	duckweed	grape	St. John's-wort	panic grasses	waterlily

These species may be used to enhance vegetation which already exists in and around woodland areas and aquatic habitats. Adding these species to those currently existing will enhance food availability for wood ducks.



Winter Range

Cover — Nesting

Wood ducks nest in natural tree cavities and in some cases, those excavated and abandoned by woodpeckers. Nesting boxes are also readily accepted for nesting. Nesting pairs typically select cavities in deciduous woodland areas in close proximity to rivers, wetlands, and other suitable aquatic habitats used for brood rearing. Cavities located 30 feet or more above the ground are preferred, but the height can vary from near ground level to 65 feet. Suitable natural cavity dimensions typically have an entrance hole diameter of at least 4 inches, an inside diameter of approximately 6 to 8 inches, and a depth of at least 24 inches. Optimal nesting habitat contains up to five suitable cavities per acre in close proximity to brood-rearing habitat; however, since most natural cavities are not suitable for use by nesting wood ducks, these conditions frequently require that 50 or 60 natural cavities per acre exist. This illustrates the utility of providing suitable artificial nesting boxes to augment the availability of natural cavities.



Nest Box Design. — Nest boxes should be constructed of a weather-resistant wood; cedar or cypress is often recommended. The wood can be painted, stained, or treated, but only on the outside surface. The entrance hole should have a 4-inch diameter or be an oval that is 3 inches high and 4 inches wide. Numerous nest box designs have been used with success; fig. 1 provides one example. A 3-inch wide strip of $\frac{1}{4}$ -inch mesh hardware cloth should be securely fastened to the inside of the box under the entrance to function as a ladder for the hen and newly hatched ducklings. The cut edges of this cloth should be folded back before insertion to avoid injury to the ducklings. Another method of assisting the ducklings in their climb from the nest to the entrance hole is to roughen up the wood surface under the hole with a chisel. A 3-inch layer of coarse sawdust should be placed at the bottom of the box to serve as nesting material and to help prevent the eggs from rolling around. The lid or one side of the box should be removable to facilitate monitoring and cleaning. All wood duck boxes should be fitted with a galvanized sheet metal predator guard (see fig. 2). The predator guard should be placed 6 to 12 inches below the bottom of the box.

Nest Box Installation. — Wood ducks are highly secretive in selecting nest sites to minimize impacts of nest predators and competition from other wood ducks. Therefore, it is important to locate individual nest boxes in relatively secluded areas within timber stands where natural cavities would occur naturally. Nest boxes can be placed either on land or over the water. If located over the water, they should be placed at least 4 feet above the high water level and the entrance hole should face the open water rather than the shoreline. Because of ease of access by predators, installation of nest boxes directly on trees should be avoided. Nest boxes placed on land should be located from 30 to 150 feet away from the shoreline. Boxes placed directly on the shoreline appear to be more likely frequented by nest predators. Since the hen must lead her ducklings to water soon after they hatch, the area between the nest box and the water's edge should be free of any major obstacles such as roads or fencing. Nest boxes placed on poles over water are generally more easy to monitor than those placed in trees. Regardless of whether the box is placed over the water or land, the entrance should be clear of obstructions to provide easy access for the ducks.

In order to maximize nest box use while minimizing nest dumping (see sidebar below), it is generally recommended that nest boxes should be placed at least 600 feet apart and should not be visible to one another. When placing nest boxes in isolated locations, consider ease of access for monitoring purposes.

Cover — Brood Rearing

Wood duck broods require shallow water for foraging on invertebrates and aquatic plants that contain some protective cover from predators. A ratio of 50 to 75 percent cover to 25 to 50 percent open water is preferred as brood-rearing (and breeding) habitat. Cover may be provided by trees or shrubs overhanging the water, flooded woody vegetation and debris, and herbaceous emergent vegetation. Ideal shrub cover is

provided by mature shrubs that provide a dense canopy about two feet above the water surface. Button bush is an important shrub species in a large portion of the wood duck's range due to its brushy growth form, providing brood cover, and its prolific seed production, used heavily by foraging adults. Reliance on permanent, deeper water bodies for brood habitat should be avoided to minimize duckling mortality from aquatic predators such as snapping turtles and large fish.

Adult molting cover requirements are generally met by suitable brood-rearing habitat. Permanent water, cover, and food are the key elements of molting habitat.

Cover — Winter

In areas where wood ducks winter, areas similar to brood rearing habitat provide adequate winter cover. Bottomland hardwood wetlands and quiet river backwaters and streams with an abundance of partially submerged downed timber, shrubs, and woody debris are favored. Winter-persistent herbaceous emergent vegetation that has a shrubby-like life form (e.g., cattail, soft rush, bulrush, bur-reed, etc.) may also provide adequate winter cover. Security provided by overhead woody cover is the key element of good wood duck roosting habitat.



Water

Water requirements for wood ducks are assumed to be met where suitable brood-rearing and wintering habitat exist.

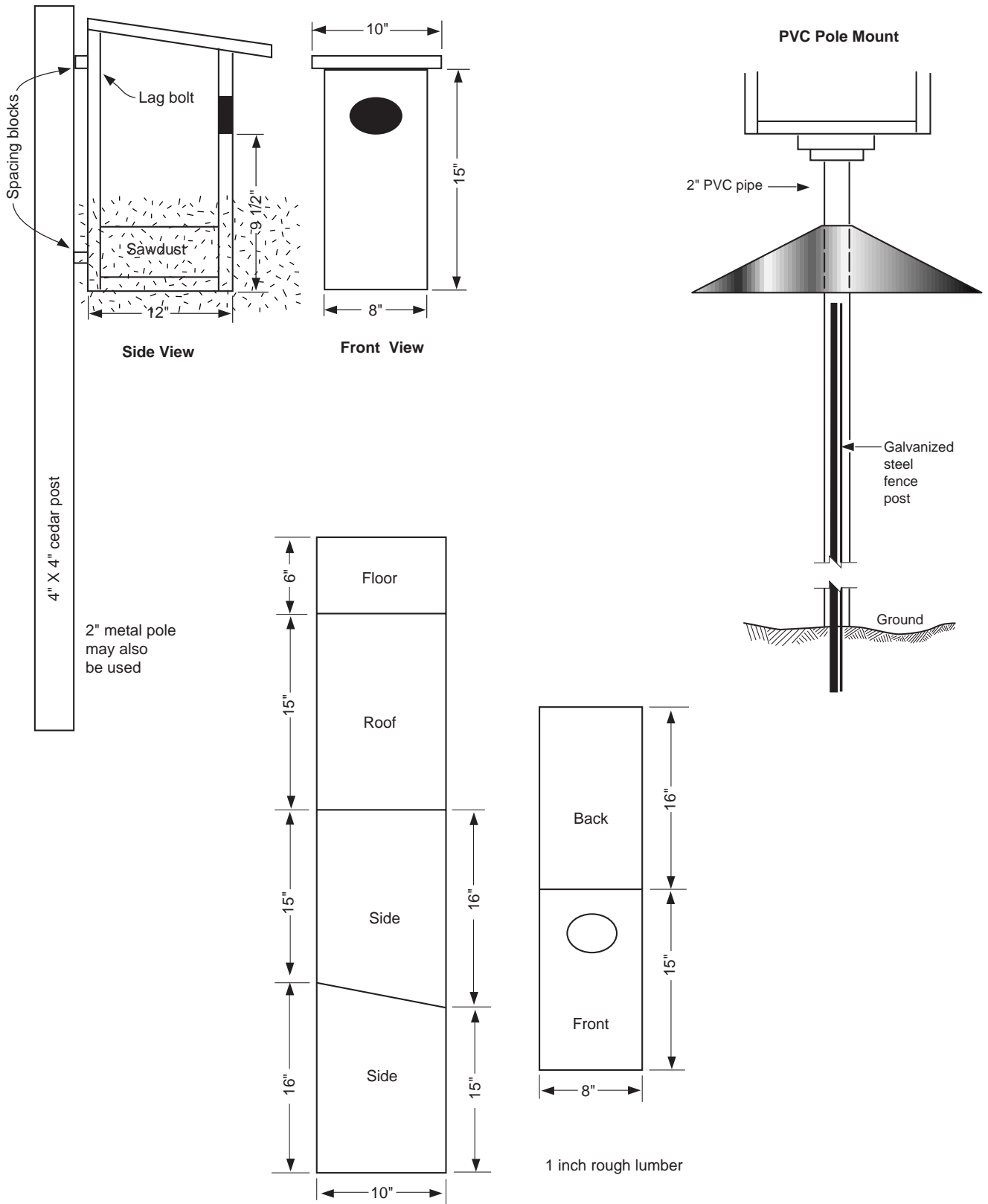
Interspersion of Habitat Components

In order for successful wood duck reproduction and survival to occur, all the habitat components must be available in relative proximity to one another. Since wood ducks are highly mobile during winter, the most critical aspect of habitat interspersion, or the mix of different habitat types, is the proximity of suitable brood-rearing habitat to nesting habitat in the spring. The highest-quality nesting habitat is of little use if the nearest brood-rearing habitat is more than a mile distant. Likewise, the best brood-rearing habitat will not support wood duck broods if there is no nesting habitat in the vicinity. In southern areas where wood ducks are year-round residents, the best habitats consist of a complex of forested wetland habitats that include live forest, green-tree reservoirs, rivers, oxbows, riparian corridors, beaver ponds, shrub-scrub and robust emergent herbaceous wetlands.

Minimum Habitat Area

Since wood ducks are able to nest at some distance from brood-rearing habitat, no reasonable estimate of minimum nesting habitat size exists. In addition, no good estimates for minimum wintering habitat area are available due to the high mobility of wintering birds. However, at least 10 acres of wetland or other aquatic habitat in a contiguous unit, or in isolated parcels separated by no more than 100 feet of upland, is needed in close proximity to nesting habitat to support brood rearing. Lands outside the immediate planning area should be considered when making the determination of minimum habitat area for wood duck reproduction.

Fig. 1. Wood duck nesting box design



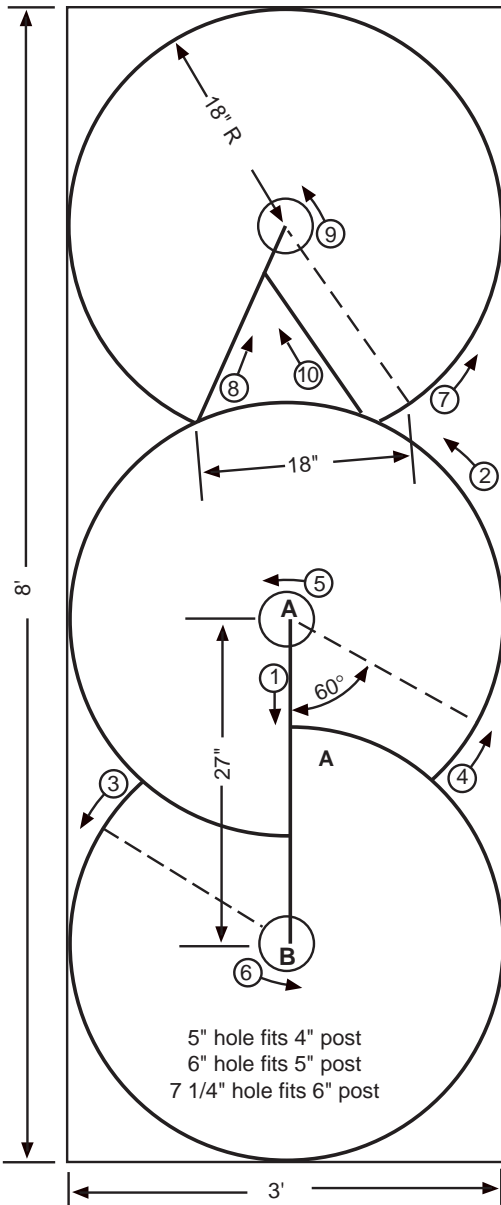
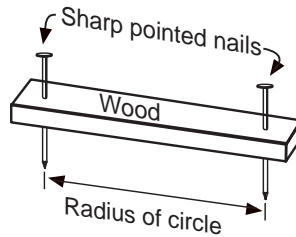


Fig. 2. Standard cone-shaped predator guard.

At left is a layout for cutting three predator guards from a 3 ft x 8 ft sheet of 26-gauge galvanized metal. When installing the guard, overlap the cut edge to the dotted line. To facilitate cutting, follow the sequence of numbers. Make circular cuts in counterclockwise direction. To make initial cut on line A-B, make a slot at A with a wood chisel, use tinsnips, and wear leather gloves.



Home made compass for scribing metal

Use 3 wooden mounting blocks

Drill pilot hole for nailing block to post

Side view cut away to show mounting block

Nail guard in place

1/4" round head stove bolts or metal screws

36" minimum above water

To minimize access to nest boxes by predators, metal predator guards should be installed on all wood duck box support posts.

Dump-Nests. — While the normal brood size for wood ducks is 10 to 15, nests have been found to contain 30 eggs or more. These extra eggs are the result of “egg dumping” or intraspecific brood parasitism. Egg dumping occurs as a result of several factors, including nest predation and lack of available nest sites. Dumping occurs when a female wood duck, frequently a first-year breeder, follows another hen to hidden or scarce nest sites during the egg-laying period. The visiting bird is stimulated to lay eggs in the nest of the other hen. In the wild, this impulse is kept in check because wood ducks normally nest in isolated locations. Artificial nesting structures are often mistakenly erected close together and in highly visible locations, such as the center of a pond. This creates a situation where egg dumping is common, and overall reproductive success plummets. A hen whose nest is dumped with too many eggs may abandon it; the result is a huge amount of wasted reproductive effort. In a natural scenario, approximately 80 percent of eggs hatch. But where egg dumping is out of control, hatch rates may drop to as low as 10 percent. Because of this, it is critical to locate nest boxes in isolated locations as described above. If wood ducks are very rare in the area, it may be necessary to place boxes in open areas initially to encourage use, and then moving them to more secretive locations as the population increases.

Wood Duck Habitat Requirements Summary Table.

Habitat Component	Habitat Requirements
Food — Young	<ul style="list-style-type: none"> Insects, aquatic invertebrates, small fish, and other high-protein animal material. Aquatic plants such as algae, watermeal, watershield, sago pondweed, and duckweed.
Food — Adult	<ul style="list-style-type: none"> Seeds of oaks, bald cypress, hickory, sweet gum, beech, button bush, arrow-arum, bur-reed, wild rice, and other mast-producing plants. Aquatic insects and other invertebrates. Aquatic plants and seeds.
Nesting Cover	<ul style="list-style-type: none"> Natural tree cavities or artificial nesting boxes in deciduous woodlands in close proximity to rivers, wetlands, and other suitable aquatic habitats used for brood rearing.
Brood-Rearing Cover	<ul style="list-style-type: none"> Shallow water for foraging on invertebrates and aquatic plants that contain some protective cover from predators. A ratio of 50 to 75 percent cover to 25 to 50 percent open water is preferred.
Winter Cover	<ul style="list-style-type: none"> Bottomland hardwood wetlands with an abundance of partially submerged downed timber, shrubs, and woody debris.
Water	<ul style="list-style-type: none"> Water requirements are met where wetlands suitable as brood-rearing and wintering habitat exist.
Interspersion	<ul style="list-style-type: none"> Prefer a complex of forested wetland habitats that include live forest, green-tree reservoirs, rivers, oxbows, riparian corridors, beaver ponds, shrub-scrub and robust emergent herbaceous wetlands.
Minimum Habitat Size	<ul style="list-style-type: none"> At least 10 acres of wetland or other aquatic habitat should be available in a contiguous unit or in isolated parcels separated by no more than 100 feet of upland in close proximity to nesting habitat.

Limiting Factors

For planning purposes, inventory the site to determine the availability of each of the basic habitat components, based on the above narrative habitat requirement descriptions. Habitat components that are absent or rated low are limiting the value of the habitat for wood ducks.

Habitat Component	Availability/Quality			
	High	Medium	Low	Absent
Food				
Nesting cover				
Brood-rearing cover				
Winter cover (may not be applicable if wood ducks do not winter in the area)				
Water				
Interspersion of habitat components				
Minimum habitat size				

Management Prescriptions

Management treatments should address the habitat components that are determined to be limiting wood duck habitat potential. For planning purposes, select among the possible action items listed below to raise the quality or availability of each habitat component determined to be limiting. A list of programs that may provide financial or technical assistance to carry out specific management practices is provided.

Habitat Component	Management options for increasing habitat quality or availability	Assistance Programs
Food	<ul style="list-style-type: none"> Plant, preserve and encourage trees shrubs and herbaceous food plants (see plant species list Insert). 	WHIP, EQIP, WRP, PFW, CRP
	<ul style="list-style-type: none"> Restore hydrology on previously drained forested wetland. 	WRP, PFW, EWP
	<ul style="list-style-type: none"> Restore hydrology and vegetation on previously drained and cropped wetland. 	WRP, CRP, PFW
	<ul style="list-style-type: none"> Establish shallow water areas and artificial wetlands. 	WRP, CRP, PFW
	<ul style="list-style-type: none"> Provide winter water on cropland and woodland. 	WHIP
Nesting cover	<ul style="list-style-type: none"> Install artificial nesting boxes over and near wetland areas. 	WHIP, WRP, PFW
	<ul style="list-style-type: none"> Preserve old growth timber, especially large, live hardwood trees in and adjacent to wetlands conducive to natural cavities. 	WRP
Brood-rearing cover	<ul style="list-style-type: none"> Restore hydrology on previously drained forested wetland. 	WRP, PFW, EWP
	<ul style="list-style-type: none"> Restore hydrology and vegetation on previously drained and cropped wetland. 	WRP, CRP, PFW, EWP
	<ul style="list-style-type: none"> Establish woody riparian vegetation along streams. 	CRP, WRP, EQIP, PFW, WHIP
Winter cover	<ul style="list-style-type: none"> Restore hydrology to previously drained forested wetland. 	WRP, PFW, EWP
	<ul style="list-style-type: none"> Restore hydrology and vegetation to previously drained and cropped or grazed wetland. 	WRP, CRP, PFW
	<ul style="list-style-type: none"> Provide winter water on cropland and woodland. 	WHIP
Water	<ul style="list-style-type: none"> Restore or establish bottomland hardwood or emergent herbaceous wetland. 	WRP, CRP, PFW
Interspersion and minimum habitat size	<ul style="list-style-type: none"> Combine above prescriptions to increase interspersion of habitat components or size of habitat blocks available. 	WRP, CRP, PFW, EQIP, EWP

For landowners interested in making their individual efforts more valuable to the community, they can work with WHC and NRCS to involve school and scout groups and their families in habitat projects. A wood duck management project is an easy way to provide fun hands on learning opportunities, especially for children. If the land is corporate owned, encourage interested employees to become involved. Involve students or scouts in building and monitoring nest boxes. The educational benefits can greatly increase the value of your individual wood duck management project.

Nest Box Monitoring. — Before nesting boxes are erected, a maintenance and monitoring plan to ensure the success of the program should be developed. Old nests and those of invasive species such as European starlings must be cleaned out regularly if the boxes are to be used more than once during a nesting season. The monitoring program should ensure that boxes are monitored at least once before the beginning of the nesting season, and should be checked at least once a month during the nesting season if multiple use of nest boxes per nesting season is desired. Boxes should remain out during the winter to provide winter cover sites for screech owls and other resident birds. For Wildlife Habitat Council member organizations, the monitoring program may enroll in WHC's *Nest Monitoring Program*, useful in WHC's *Corporate Wildlife Habitat Certification Program*. Enrollment can be accomplished by contacting the WHC Nest Monitoring Program Coordinator at (301) 588-8994.

Programs that provide technical and financial assistance to develop fish and wildlife habitat on private lands.

Program	Land Eligibility	Type of Assistance	Contact
Conservation Reserve Program (CRP)	Highly erodible land, wetland, and certain other lands with cropping history. Stream-side areas in pasture land.	50% cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10 to 15-year contracts. Additional financial incentives are available for some practices.	NRCS or FSA State or County Office
Emergency Watershed Program (EWP) Floodplain Easements	Flood-damaged croplands.	Up to 100% cost-share for floodplain wetland restoration and payments for purchase of conservation easements.	NRCS State or County Office
Environmental Quality Incentives Program (EQIP)	Cropland, range, grazing land & other agricultural land in need of treatment.	Up to 75% cost-share for conservation practices in accordance with 5 to 10-year contracts. Incentive payments for certain management practices.	NRCS State or County Office
Partners for Fish and Wildlife Program (PFW)	Most degraded fish and/or wildlife habitat.	Up to 100% financial and technical assistance to restore wildlife habitat under minimum 10-year cooperative agreements.	Local office of the U.S. Fish and Wildlife Service
Waterways for Wildlife	Private land	Technical and program development assistance to coalesce habitat efforts of corporations and private landowners to meet common watershed level goals.	Wildlife Habitat Council (301-588-8994)
Wetlands Reserve Program (WRP)	Previously degraded wetland and adjacent upland buffer, with limited amount of natural wetland, and existing or restorable riparian areas.	75% cost share for wetland restoration under 10-year contracts, and 30-year easements, and 100% cost-share on restoration under permanent easements. Payments for purchase of 30-year or permanent conservation easements.	NRCS State or County Office
Wildlife at Work	Corporate land.	Technical assistance on developing habitat projects into a program that will allow companies to involve employees and the community	Wildlife Habitat Council (301-588-8994)
Wildlife Habitat Incentives Program (WHIP)	High-priority fish and wildlife habitats.	Up to 75% cost-share for conservation practices under 5 to 10-year contracts.	NRCS State or County Office
State Fish and Wildlife Agencies and private groups such as state waterfowl associations, Ducks Unlimited, Pheasants Forever, and others may have assistance programs in your state.			State or local contacts

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***Natural Resources
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