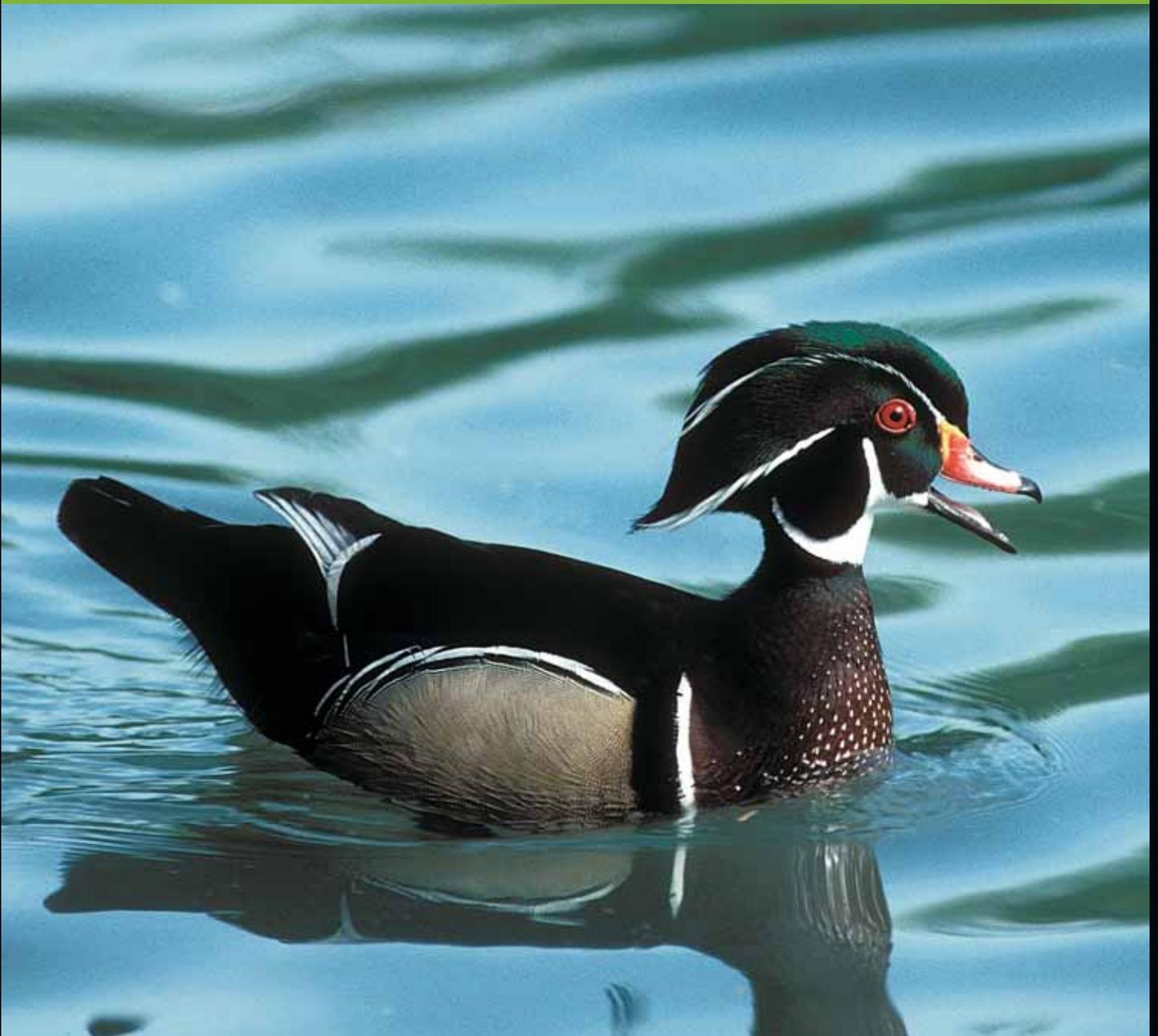


MANAGING FOR
WOOD DUCKS
IN EAST TEXAS



MANAGING FOR WOOD DUCKS IN EAST TEXAS

by

Carl Frentress

Regional Waterfowl Biologist, Retired – East Texas

Acknowledgements

The following persons are due special recognition for their contributions to this publication: Vernon Bevill, Dr. Brian Davis, DeAnna Faulk, Dr. Eric Frasier, Hayden Haucke, Robert L. Jessen, Kevin Kraai, Dr. James C. Kroll, Mary Lane, David Lobpries, Brad McCool, M. D. Marks, Dave Morrison, Dale Prochaska, Dr. Dean Ransom, Anne Storey, Charles Stutzenbaker, and Dr. Raymond C. Telfair II. Thanks also are due the numerous private cooperators who participated in the nest box project. Finally, the Wetland Habitat Alliance of Texas and Ducks Unlimited are recognized for financial contributions for nest box materials and conservation of wood duck habitat.

Information in this bulletin includes findings from studies funded by Pittman-Robertson federal aid projects and Texas duck stamp funds.

Design by

Tim Peterson, Creative Services Branch Chief, Texas Parks and Wildlife Department

Cover Photo: Wood Duck, TPWD

SAVED FROM THE VERGE OF EXTINCTION

IN THE EARLY 1900s, WOOD DUCKS WERE ON THE VERGE OF EXTINCTION DUE TO HABITAT LOSS FROM OVER-HARVESTING OF TIMBER, DRAINAGE OF SWAMPS AND MARSHES, AND EXCESSIVE EXPLOITATION BY MAN FOR ITS MEAT AND FEATHERS. THE MIGRATORY BIRD TREATY ACT OF 1918, WHICH WAS ENACTED FOR THE PROTECTION AND WELL BEING OF ALL MIGRATORY BIRDS, GAVE PROTECTION TO WOODS DUCK BY CLOSING THE SEASON UNTIL 1941. SINCE THAT TIME THIS BEAUTIFUL BIRD HAS REMAINED THE SUBJECT OF SUBSTANTIAL ATTENTION BY WATERFOWLERS, BIRDERS, AVICULTURISTS AND BIOLOGISTS.



FIGURE I
Wood Duck
Aix sponsa

IDENTIFICATION AND RANGE



Photo: Kevin J. Kraai

The commonly used name “wood duck” denotes its affinity for trees. Wood ducks spend most of their life in or near forested areas.

The wood duck, which belongs to the perching duck tribe, is the only member of this tribe found in North America. It is closely related to the elaborately colored mandarin duck of Asia. Like the mandarin, adult male wood ducks have beautiful plumage. In fact, the scientific name, *Aix sponsa*, is interpreted from the Latin as “betrothed duck,” alluding to the extravagance of a bride’s dress in similarity to male wood duck plumage. As with other North American duck species, the females and juveniles have generally drab, gray-brown plumages (see Figure 1).

It is no surprise that a bird of such extravagant appearance and extensive range is known to many people, and has been given a variety of colloquial names. Names such as summer duck, woods, acorn duck, black brancier, gray duck, plumer, squealer, swamp duck, tree duck, wood widgeon, crested wood duck and Carolina duck attest to its unique habits, features and haunts. The commonly used name “wood duck” denotes its affinity for trees. Wood ducks spend most of their life in or near forested areas. They often perch in trees during the spring and summer; females use tree cavities as nesting sites; during winter all wood ducks feed heavily on the mast of bottomland hardwood trees.

Wood ducks are not shy with their vocalizations. If you have approached a group of feeding wood ducks, you are familiar with the squeals, clucks and squeaks they make while foraging. At other times different sounds are made by both the male and female birds. Generally, the male’s calls are softer and less audible than those of female wood ducks. In fact, the calls of the females have earned the species the widespread local name of “squealer.”

In comparison to other North American duck species, wood ducks are mid-sized birds. Adult males weigh slightly more than 1-1/2 pounds, while adult hens average 1-1/4 pounds. Juveniles weigh about one pound when they reach flight stage at eight weeks of age. Ducklings one to two weeks old weigh about six ounces.

In summer (June or July) males molt into drab eclipse plumage and replace the flight feathers in their wings. In August or September the drake molts from its eclipse plumage into full winter plumage. Females begin their post-nesting molt later than males since they must remain active while incubating and brood rearing. During these summer molts, wood ducks are vulnerable from loss of the flight feathers. They become secretive because they temporarily are flightless at this time. Juveniles molt body feathers in their first fall of life. Adult plumage is perfected during the second spring.

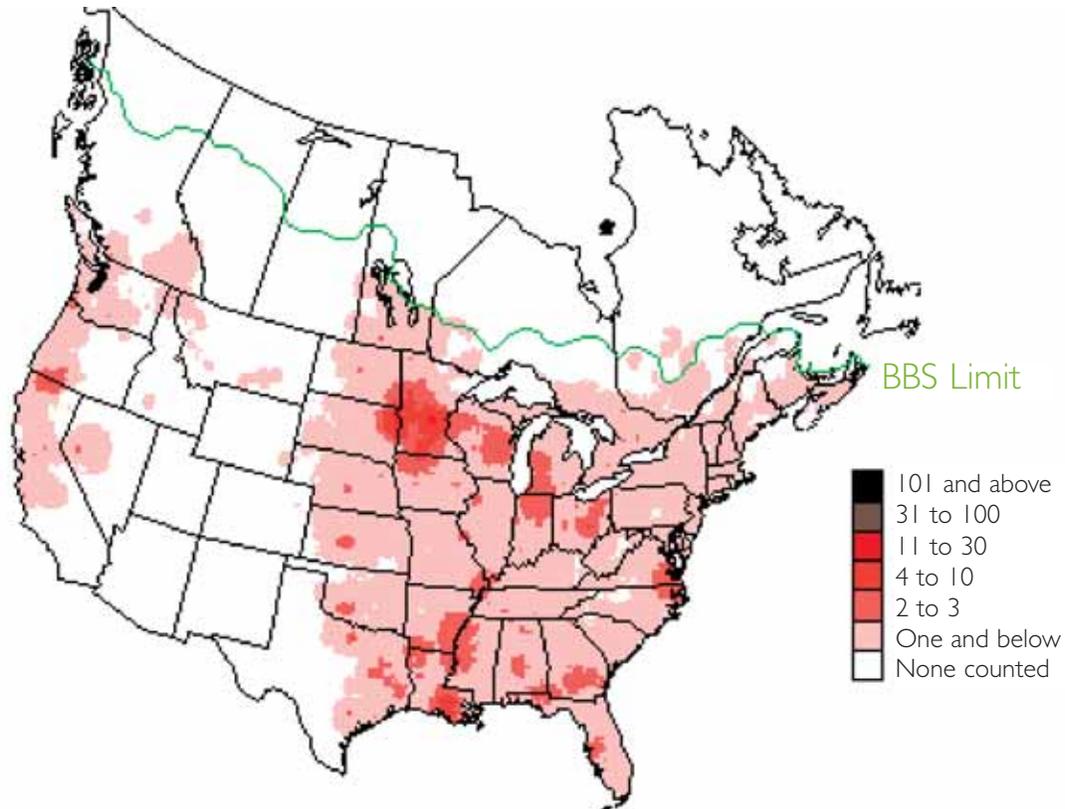


FIGURE 2
Breeding Range
Patuxent Wildlife
Research Center

The breeding range of wood ducks encompasses all the United States east of the Great Plains (see Figure 2). Wintering grounds are along the Atlantic seaboard and the Gulf coasts. A separate and disjunct population breeds in the Pacific Northwest and winters in California. In Texas the ducks live primarily in the eastern portion of the state, but may be found beyond the Edwards Plateau. A small population extends into the Panhandle via the Canadian and Red River drainages. Winter migrants are most numerous in East and Southeast Texas; however, they have been encountered in the Panhandle, west to El Paso and south to Brownsville.

It is important to note that two separate populations of wood ducks occur in Texas. During the fall and winter, adult birds that nested in Texas generally remain in the state. This also holds true for the young birds that were produced in the state during the spring and summer. Together all of these birds form a resident wintering population. Texas also is the winter terminus for wood ducks migrating from states and provinces to the north. Consequently, the state hosts a migrant, non-resident, wintering population of wood ducks. Both populations, the residents and the migrants, mix into one large, composite wintering population. As spring migration draws near (usually in late winter) these birds begin to sort themselves into the two distinct breeding populations.

Wood ducks reach breeding age the first spring after hatching. Most wood ducks court and establish pair bonds during winter. This seems to be particularly true

Texas also is the winter terminus for wood ducks migrating from states and provinces to the north. Consequently, the state hosts a migrant, non-resident, wintering population of wood ducks.

for resident wood ducks. Some out-of-state birds may pair in the autumn and migrate south as mates. During most of the year the drakes normally are tolerant of each other; however, during courtship the males often peck each other and chase drakes that come too close to the hen of interest. The actual pair-bonding behavior involves a series of specific movements and activities (known as courtship displays) that are exhibited by both the drakes and hens.

After the pair bond is established, drakes and hens remain mated for the duration of the nesting season. If either of the pair is lost before the nest is started, the remaining duck may select a new mate. Later in the breeding season when fewer individuals remain unmated the likelihood of acquiring a new mate decreases. Wood ducks select new mates each year.

A noteworthy aspect of wood duck biology is the fact that breeding populations for any given geographic area are maintained by strong homing tendencies in the hens. This behavior is strongest in older adult hens. A high percentage of the hens return to nest in the area where they were hatched and reared. This is an important fact in the management of wood duck breeding populations since studies have shown that homing wood duck hens nest within five miles of their original rearing area. If the local population of hens is lost for some reason, considerable time may elapse before nesting wood ducks reoccupy the vacant breeding habitat. Drakes do not have this strong homing tendency; they follow their mates to their breeding areas. Consequently, any given drake may spend successive breeding seasons at various locations around the country.

The breeding populations of wood ducks in Texas are composed of females that were raised in the places where they are nesting and males that come from anywhere in the continental wood duck range. The hens maintain the geographic integrity of the breeding population while the drakes provide for exchange of genetic material within the continental population. As nest initiation nears, Texas hens take their mates to their respective locales within the state while out-of-state hens begin migration with their mates to nesting areas where they were reared.

Late winter habitat conditions strongly affect the success of breeding wood ducks. Shallow flooding in bottomland hardwood forests is a key factor for production success. This flooding stimulates population explosions of aquatic invertebrate animals that are required for wood duck hens to achieve optimal breeding condition and to lay sufficient clutches of eggs. This situation, therefore, is one of the reasons conservationists strive for protection and management of bottomland hardwood ecosystems. The proper functioning of bottomland hardwoods is essential to the multitude of wildlife species that occupy them. Wood ducks are significant among the types of animals that depend on these forested wetlands.

After pair bonding the nesting season begins with the search for a suitable cavity in which the hen may nest. In Texas this activity may start in late January or early February. The search begins in the morning with the male accompanying the female. While the hen inspects a prospective natural cavity in a tree or an artificial nest box, the male waits outside perched on a nearby limb or other vantage point. If the site is unsuitable to the hen, she leaves in search of another site with the drake following. The male plays no active role in nest site selection although he does follow the hen throughout the process.

Yearling hens, which tend to nest later than the older adults, sometimes find all available cavities occupied by the time they are ready to nest. When this occurs, the yearling hens may not nest at all. A lack of nesting cavities may be due to too few cavities or too many nesting hens.

Preliminary findings from research in Texas suggest that yearling hens may be facing this problem in some locales. Thus, there may be some fallacy in the assumption that “wild” cavities are extremely abundant or under-utilized. Apparently wood duck hens become more proficient at nesting as they become more experienced. Studies of known-age hens have shown that rearing success and production increases as the hens grow older.

After nest selection, the hen lines it with down plucked from her breast plumage. Only down is used in the nesting cavity. No other nest material is brought into the cavity. Each day, usually in the morning, she lays one egg until the clutch is complete. More down is added as each egg is laid. The average clutch is about 12 eggs. Wood duck eggs vary in color from dull white to almost beige. Eggs are the same shape as domestic chicken eggs only smaller. The female begins to spend long periods in the nest as the clutch nears completion and may start incubation within 24 hours after the final egg is laid. Most female wood ducks nest only once each year but may reneest if the first clutch of eggs is destroyed or lost early in incubation.

Sometimes two or more females deposit eggs in the same nest. These are known as “dump nests” and may be attributed to a shortage of suitable nest sites. Dump nests have been known to contain several dozen eggs. Under some conditions dump nests may contribute to overall production since a greater proportion of young are hatched than in normal nests.

Two or three days may elapse from the first pipping of eggshells until the ducklings actually emerge from the eggs. With the long nesting period in Texas the hatching peak may not be as pronounced as in other wood duck production states. Nonetheless, a large proportion of broods are thought to be hatched from mid-April to mid-May. Records from our Texas studies show a hatching date as late as July 14.



Photo: TPWD



Photo: TPWD

*“A true conservationist
is a man who knows
that the world is not
given by his fathers
but borrowed from
his children.”*

- John James Audubon

The ducklings usually are ready to leave the nest the morning after they hatch. After checking for danger, the hen drops to the water or ground below the nest cavity and calls to her ducklings. Similar sounds were made as the ducklings hatched so they have been conditioned to respond. Stimulated by calls outside the nest, the ducklings jump upward toward the entrance hole and ultimately leap from the nesting cavity. They have sharp toenails and a sharp tip on their bills to aid climbing from the cavity. As they fall, the hen gathers them about her until the full brood is assembled. Seldom are the ducklings injured by the fall. The shock of hitting the ground or water is believed to release feeding mechanisms in the ducklings.

By some reported estimates, approximately 40 to 50 percent of the hatched ducklings survive to enter the fall population. Most duckling mortality seems to occur within two weeks after hatching. In good habitat, high production density is considered to be two to five flight-age young per acre. In juvenile populations the proportion of males to females is approximately equal. In adult populations the males tend to outnumber the females slightly.

The specific features that attract a hen to a given cavity, be it natural or artificial, are poorly understood. It is known that the cavity should be dry and large enough to accommodate the hen's body. The floor size of suitable cavities may range from about 80 to 100 square inches. These sizes are very general, however. Studies show that nest boxes placed adjacent or in larger permanent wetlands are more attractive to female wood ducks. Restricted visibility to another cavity also is believed to be preferable. This is because wood duck hens protect their nest territory by driving away competing hens. Besides being sought by nesting wood ducks, dry, roomy cavities also are used by a host of other competitors such as starlings, screech owls, crested flycatchers, chickadees, wood rats, squirrels and wasps. These animals are some of the most notable competitors for cavities since they commonly are found in hollows during the period when wood ducks are nesting.

Hardwood bottomlands of creek and river floodplains are traditional wood duck nesting habitats. Because these habitats have suffered substantial losses, the fate of the wood duck in Texas is a matter of concern. Studies of the habitats used by these birds are important to develop future management strategies for wood ducks in the state. Protection of these bottomland forests along with the natural wetlands associated with them is vital in wood duck conservation.

During different seasons of the year wood ducks use a variety of habitats within the forested regions they inhabit. With the nesting season underway, the pairs are found where cavities are available to meet the nesting needs of the female and where streams or slackwater areas are available for the drake to loaf. Usually these nesting areas have nearby wetlands to serve as rearing areas for

ducklings. The ducklings need adequate cover to escape predators and find shelter from the elements. Just as important, though, are the shallow, slackwater wetlands teeming with insects and aquatic invertebrates that provide the protein-rich diets for the rapidly growing ducklings. When possible these habitats should be protected or enhanced as production areas for wood duck ducklings.

When the juvenile birds reach fledgling age, they begin to shift to seed diets and depend less on animal food supplies. In Texas many of the juveniles and post-breeding adults congregate in permanent wetlands in late summer and early fall. These areas provide an abundance of freshly ripened seeds for food at this time of the year. As hard mast crops, such as acorns, mature and drop in late fall or early winter, wood ducks feed almost exclusively in the creeks, rivers and flooded areas of hardwood bottomlands. Consequently, during the winter wood ducks truly become birds of the forests.

In the winter season roosting concentrations of wood ducks become most obvious. Wood ducks, like many other waterfowl species, like to be together. This is especially true in their nighttime roosting behavior. Roost flocks may range from only a dozen or so birds to aggregations of a thousand or more. Roosts are generally permanent water sites in remote areas. Usually, they are characterized by dense growth of wetland shrubs such as water elm or buttonbush. The thick canopy of limbs on these shrubs provides overhead shelter for wood ducks seeking protection from predators, especially barred owls.

Flocks of wood ducks stream in all directions from their feeding grounds toward the roost sites each evening. The greatest flurry of activity is just before dark when flight after flight of birds may drop into the roost. To a hidden observer in a large roost, this can be an exciting experience. The multitude of wood ducks splashing, calling and darting about on the water, coupled with the erratic and fearless flight of successive waves of incoming birds can create an atmosphere reminiscent of the hub-bub of a large, modern airport. However, with the onset of darkness the roosting birds become relatively quiet until their departure before sunrise the following morning. Some roost sites may be used repeatedly throughout the winter and year after year. Other roosts may shift, particularly if birds are disturbed.

Wood ducks have the potential to remain one of the outstanding waterfowl species in Texas if proper habitat is retained and effective management plans are put into action. Selective harvests used in timber management practices are valuable in retaining or increasing the number of natural nesting cavities. An intensive nest box program in suitable habitat can increase the local production of wood ducks. Measures to increase the quality and quantity of brood-rearing habitat must accompany nest box programs (see Figure 3).



FIGURE 3
Ducklings in
Nest Box



Photo: Carl Frentress

Wood ducks have the potential to remain one of the outstanding waterfowl species in Texas if proper habitat is retained and effective management plans are put into action.

Although these birds occupy wild forest areas, wood ducks also can be featured in urban and suburban wildlife management plans because they are adaptable to human activity. The numerous ponds, lakes and streams in city parks offer good locations for wood duck nest boxes and habitat improvement practices. Projects of this type exist throughout the state. In these settings, wood ducks are a valuable resource to wildlife watchers.

With this versatility of response to management programs and the potential for involvement of persons from various sectors of the wildlife arena, wood ducks can become the focus of a large-scale, integrated wildlife management effort in the state. However, the success of such a program will depend on cooperation among government, public and private concerns.

Fortunately, with the wood duck we have the potential to engage in an effective management program. Yet this program must rely not only on the participation of the Texas Parks and Wildlife Department (TPWD), but also on individual landowners, concerned citizens, other government agencies, private timber companies, civic groups, private wildlife organizations, youth organizations and other factions interested in contributing to the betterment of the wood duck in Texas. With this bird and its habitats, we are all challenged to demonstrate our sincerity in meeting our stewardship responsibilities. The two most beneficial actions for wood ducks are to conserve forested wetland habitat and conduct effective nest box projects. For many conservationists, nest boxes allow for immediate and productive activities. Below is a discussion of considerations appropriate for successful use of nest boxes to benefit wood ducks.

NEST BOX PROJECTS

Prior to 1982 attention to wood duck management in Texas addressed population factors. The focus was on banding and harvest estimates.

By 1984 priorities of the TPWD waterfowl program encompassed major habitat enhancement initiatives. Subsequently, decisions were made to evaluate opportunities for increasing local populations of wood ducks through implementation of a large-scale nest box project involving private cooperators across the state.

Results of TPWD surveys indicate that large-scale nest box projects can be beneficial to resident wood ducks. During the course of a cooperative nest box project from 1987 through 1999, approximately 23,000 were distributed to about 2,400 cooperators. These boxes were monitored annually for use by ducks and the results reported to TPWD personnel by the cooperators. Rates of nest box use by wood ducks increased to approximately 30% during the course of this project. This pattern is believed to reflect enhancement of local wood duck populations. Strengthening or establishing colonies of breeding hens through addition of artificial cavities in the habitat base explains the gradual increase in utilization rates. The process works because young hens survive and return to nest in the area they were reared. In this way the overall number of breeding females in any given locale is increased. Without survival and subsequent breeding of these females that are recruited into a colony, the nest box utilization rates would not increase.

At the Gus Engeling Wildlife Management Area (GEWMA) in Anderson County utilization rates increased to and stabilized at almost 60% during 13 consecutive breeding seasons (Table 1.). Conditions at GEWMA offer abundant wood duck habitat and excellent annual maintenance of boxes. This site served as a standard for comparison of success in the statewide cooperative nest box project. Because of these study results, we believe erecting artificial nesting cavities can be beneficial to increasing numbers of wood ducks in Texas (see Table 1).

Based on the results of these studies, nest box projects to increase wood ducks are recommended for conservation-minded landowners in many portions of Texas. The technique especially is beneficial in the eastern portion of the state where wood ducks are most abundant. In fact, this popular wildlife management technique is famous for its benefits to wood ducks over much of the eastern United States. Wetlands in urban parks, suburban greenbelts and rural environments offer opportunities for nest box projects.

For reasonable chances of success, a remnant breeding population of wood ducks must exist nearby. Because wood duck hens prefer to return to the same

Based on the results of these studies, nest box projects to increase wood ducks are recommended for conservation-minded landowners in many portions of Texas.

TABLE I

Trend in utilization of nest boxes by wood ducks at Gus Engeling Wildlife Management Area, Anderson County, Texas, 1982-1994.

Year	No. of boxes used	No. of boxes in sample	Percent (%) use
1982	3	19	15.8
1983	10	26	38.5
1984	6	20	30.0
1985	8	30	26.7
1986	19	64	29.7
1987	39	65	60.0
1988	45	80	56.3
1989	49	90	54.4
1990	46	75	61.3
1991	40	75	53.3
1992	32	63	
1993	46	79	58.2
1994	32	57	56.1

location where they nested the previous year, sightings of wood ducks within approximately 1/2 mile of the proposed nest box location are desirable indicators of whether or not nesting will occur. Young hens, nesting for the first time, choose to return to the location where they were raised as ducklings. Because of this “homing instinct,” breeding wood ducks spread very slowly into new territory.

The breeding range of wood ducks covers all East Texas. Here, resident wood ducks nest from January through July. During fall and winter these birds are mixed with migrant wood ducks from northern regions. Consequently, observations based on winter sightings are not reliable for determining if wood ducks breed in your vicinity. However, migrants depart in February and March. Therefore, if wood ducks are observed from April through August, one may assume wood duck hens are nesting nearby. These breeding season residents are likely candidates as nest box users.

Black-bellied whistling ducks, another species of cavity-nesting waterfowl, are increasing their breeding range in Texas. Therefore, in coastal Texas, South Texas, and some isolated locales in the central and northeastern portions of the state, black-bellied whistling ducks may utilize nest boxes. Black-bellies nest later – typically from May to August. The information in this booklet on box location, installation, maintenance and construction also can apply to black-bellied whistling ducks. The only exception is that a 4-inch diameter opening is recommended for the nest box entrance hole. Consequently, enlarging the entrance hole makes nest boxes more attractive to black-bellied whistling ducks.

The following instructions are provided to guide installation and maintenance of the nest boxes. This information is developed from published literature, our experiences on TPWD study areas, and comments received from private cooperators. Effort has been made to give sufficient details. However, the situation at your site may require modification of the guidelines offered in this booklet. Obviously, personal ingenuity is the best source for solving local problems. See Table 2.



FIGURE 4
Black-Bellied
Whistling Ducks



Photo: Allen Forshage

TABLE 2

Five Primary Rules for Installation of Nest Boxes

- 1. Place the boxes adjacent or in the wetland you have selected.**
- 2. Disperse the boxes individually throughout the wetland serving as the production area. That is, do not clump the boxes.**
- 3. Place the boxes so they are visible from at least one quarter of their surroundings, preferably the direction toward the wetland.**
- 4. Place the boxes so that when you are standing at any given box location you cannot see other boxes nearby.**
- 5. Protect the box from entry by predators.**

NEST BOX LOCATION

Typically, sites suitable for breeding wood ducks contain shallow wetlands such as marshes, swamps, beaver ponds, sloughs, oxbows, meandering streams, or the vegetated margins of manmade ponds and lakes. Bottomland hardwood forests adjacent with watercourses leading to brood-rearing habitat are excellent sites for location of nest boxes. Large, open bodies of water with clean shorelines do not provide breeding habitat needed by these ducks.

Good brood-rearing habitat is essential. This is the place where the broods of ducklings grow to flight stage, which is about eight weeks of age. These environments are characterized by abundant vegetation emerging above the water and growing along the shoreline. Preferably, wetland shrubs are mixed well throughout the emergent marsh vegetation. Examples of desirable wetland vegetation include water lilies, lotus (yonkapin), cattails, bulrushes, sedges, bur-reed, floating-leaf pondweed, arrowhead, buttonbush, water elm (planertree) and swamp privet. Within this thick emergent vegetation, ducklings will find abundant food supplies comprised of insects, aquatic invertebrates and small vertebrates. These types of foods are required for rapid growth and good health in the ducklings. The lush vegetation also provides protective cover for the ducklings and the attendant adult hens. Logs, limbs, live or dead shrubs, clumps of vegetation and small islands in the wetland are desirable. These offer loafing sites with immediate access to escape cover. Small pools of open water covering about 1/4 to 1/3 of the area usually are present in good habitat. This heavily vegetated wetland setting also is vital to adults that must molt into new plumages after the young have reached flight stage. During this feather replacement period, the adults are flightless. Consequently, they must find escape cover and abundant food immediately accessible because they cannot fly to avoid predators, or, to find other feeding sites. Permanent water is necessary to recharge the wetland at least until late summer. At sites with whistling duck production, this requirement extends later into the summer or to early fall (see Figure 5).

Nest boxes may be placed adjacent or in wetlands with good breeding habitat. Shoreline placement is perhaps the most reasonable location for nest boxes because these situations are readily accessible while still allowing the ducklings immediate access to escape cover and food supplies as soon as they leave the box. Ducklings have poor chances of survival if they must travel overland to reach brood-rearing habitat. Placement in the wetland certainly is acceptable to the ducks, but usually results in more difficulty for installation and maintenance of the boxes. The fact that predators often hunt along the shoreline of wetlands has been suggested as a drawback to positioning nest boxes in this area. This has been overcome by using support poles and predator barriers. Generally, shoreline placement is best because this makes the boxes easier to inspect and

service each year. Boxes should be placed in the open away from overhanging limbs or vines and clear of nearby bushes or other tall vegetation. Nest box holes should be faced toward the open wetland area so they are easily visible and accessible to approaching wood ducks.

The use of support poles is an important approach to locating nest boxes. Attaching nest boxes to trees is not recommended. The use of support poles rather than trees is favored for two reasons: 1) with support poles, boxes can be placed where they have the best chance of being used by ducks, and, 2) effective predator barriers can be used on support poles. Research in Texas has shown that boxes adjacent open, herbaceous wetlands are most attractive to wood duck hens. Nationwide research has revealed that when several nesting cavities can be seen simultaneously, hens may lay eggs in any or all of the boxes but not incubate any of the eggs. Dump nesting also tends to increase in these situations. For this reason, we recommend visual separation among the nest boxes placed at any given wetland. Placement of boxes on trees limits reliable application of these techniques.

NEST BOX INSTALLATION

The tasks described in this section relate to assembling the nesting units and getting them installed at the sites selected according to the recommendations given above. (Note: We consider a "nesting unit" to be: 1) a nest box, 2) a support pole, and 3) a predator barrier.)

Obviously, a variety of supports exist. You already may have suitable posts or pipe available to use as support poles. However, if purchase is necessary, heavy-wall electrical conduit tubing is a suitable material for support poles. We recommend 10-foot lengths in 1-inch diameter. The best attachment is by 1/4 x 2 inch bolts. Be sure to place a flat washer against the bolt head and a flat washer/lock-washer combination behind the nut. Wooden poles also are acceptable. When nails are used to attach the boxes to wooden posts, a flat washer should be placed against the nail heads. Wooden posts should be pressure-treated with wood preservative (e.g. "Wolmanized"). These posts should be 10 feet in length and three to four inches in diameter. Pressure-treated two-by-fours in 10-foot lengths have been used. With two-by-fours, braces may be needed to prevent warping. Postholes should be 1½ to 2 feet in depth. Wooden stakes may be driven beside posts to stabilize them in waterlogged soils. Nest boxes should be nailed in place before the posts are dropped into the holes.



FIGURE 5

Ideal Brood
Rearing Habitat



Photo: Carl Frenress



Photo: Kevin J. Kraai

FIGURE 6
Next Box
Installed

Nest boxes should be at least seven or eight feet above the ground or water level. Remember to clear away all limbs and vegetation that may offer a pathway for predators to reach the box. An inspection during the growing season also is suggested because many large herbaceous plants or woody sprouts can quickly grow to heights within reach of the nest box. In floodplains, boxes should be placed in locations expected to remain above high water (see Figure 6).

Numbers may be painted on each box so you can keep a record of duck use for each nest box through the years. Use enough paint to prevent the numbers from fading with time. Repainting of numbers may be necessary during the annual fall/winter maintenance activity discussed below. Sawdust, wood shavings or wood chips (all from untreated wood) should be added to a depth of about four inches in the bottom of the nest boxes. Check all boxes to be sure the hardware cloth "ladder" is present and securely fastened inside the boxes. This is the only means for duckling to exit the boxes. They must have a way to leave the boxes. The "ladder" is an important provision; be sure it is in place.

NEST BOX PREDATION

Finally, a predator barrier must be installed on the support pole. Predator barriers are mandatory. Do not eliminate this feature from nesting units. It can prevent the nest box from becoming a death trap for nesting wood duck hens.

In Texas serious predators of wood duck eggs are rat snakes ("chicken snakes") and raccoons. Both are extremely proficient at locating and entering wood duck nesting cavities. However, rat snakes are the primary predators and pose the greatest threat by far. They are proficient and diligent climbers and are highly effective in locating any prospective prey in elevated cavities. Raccoons can damage wood duck nests, but Texas studies indicate they are not as detrimental as rat snakes. Barriers that exclude rat snakes generally exclude raccoons also. Nonetheless, do not underestimate the capabilities of either animal in gaining access to a wood duck nest.

All artificial nest boxes for wood ducks should be equipped with an effective predator guard. Also, overhanging or nearby limbs or tree trunks that could offer access to nest boxes should be eliminated. Similar measures may be taken to protect suitable natural tree cavities. Such protection from predators cannot be overemphasized. Predation is a factor often overlooked by persons eager to embark on a wood duck nest box program. A nest box without a reliable predator guard is not fully equipped and may become a death trap rather than a haven for wood duck hens or their eggs.

Various methods are used to restrict predator access to nest boxes. The cone-shaped, metal, predator guards are reasonably effective in reducing access to nest boxes by rat snakes and raccoons. However, they are not as effective as other options. Additionally, they provide no barrier to fire ants. An effective substitute that also excludes fire ants is food-grade waterproof grease. By applying an ample two-foot-wide band of grease to the support pole below the nest box, a barrier can be created that will exclude rat snakes, raccoons and fire ants. During hot Texas summers, grease may be absorbed into wooden posts unless the wooden surface first is varnished or painted to seal the pores. Grease may need to be re-applied periodically on support poles.

A longer lasting, extremely sticky, commercial product trademarked as "Tanglefoot" insect pest barrier can be used as a more durable alternative to grease. This is a heavy, adhesive, persistent, waterproof, nontoxic formulation that can be smeared on the support poles under the nest boxes. TPWD trial applications of Tanglefoot have lasted six years in the field without need for adding more material. This is a very effective barrier to predators. It is inexpensive, easily applied and preferred by many persons who maintain nest boxes. Many local feed-and-seed stores also can obtain Tanglefoot. This is the best method for restricting predator access to nest boxes.

Additionally, some wood duck managers report excellent success in excluding predators by the use of "schedule 40" polyvinyl chloride (PVC) pipe (the "blue pipe") in four-inch diameter as support poles. The surface of the pipe is exceptionally hard and slick. Almost all predators are unable to climb this type of support pole. Obviously, application of Tanglefoot will give added protection. This type of plastic pipe, however, costs more than metal or wooden posts.

Nest boxes should be installed whenever time is available to undertake the task. However, some people prefer to wait until late fall or early winter so that boxes are ready for early nesting that can begin in late January. If boxes are installed earlier than fall, they should be checked again in winter in preparation for the onset of nesting.

The potential exists for several females to nest in any given box during the course of the breeding season. The older females may nest earlier followed later by younger hens. These hens that nest later are more likely to select a box with fresh conditions rather than a box containing debris from the previous nesting.



Photo: Carl Frenness

FIGURE 7

Debris from a Nest Box

NEST BOX MAINTENANCE

After the initial installation, nest boxes should be checked and cleaned following each breeding season. To avoid unpleasant encounters with wasps that frequently build paper nests in the boxes after the ducks have departed, we recommend waiting for the colder periods in November or December for this activity. All material should be removed and replaced with fresh sawdust, wood chips, or wood shavings. Repairs or adjustments to the box, pole and predator barrier should be done at this time also (see Figure 7).

NOTE: Give special attention to the presence of bees in boxes. Africanized honeybees could occupy boxes although this situation has never been reported.

For record-keeping purposes, many people are interested in observing wood ducks or whistling ducks as they use the nest boxes. Incubating hens may remain in the nest even when the box is approached or opened by human visitors. Young persons often are especially intrigued by this experience. Nest boxes may be inspected during the course of the nesting season if caution is given to not disturbing the hen too frequently. After each inspection of a nest under incubation, exposed eggs always should be covered with down or sawdust from the nest cup. This prevents incubated eggs from becoming chilled, thus killing the developing embryos. Normally, the hen covers the eggs when she leaves to feed and rest. Naturally, if she is scared from the nest or removed during your inspection, she will not have an opportunity to cover the eggs.

Because of their tameness during incubation, wood duck hens may be handled momentarily if care is taken not to cause them injury. These opportunities for close observation and documentation offer an added dimension to the pleasurable process of assisting production of cavity-nesting waterfowl in Texas. (CAUTION: Keeping live wild ducks or their eggs in your possession is prohibited by state and federal law.)

The potential exists for several females to nest in any given box during the course of the breeding season. The older females may nest earlier followed later by younger hens. These hens that nest later are more likely to select a box with fresh conditions rather than a box containing debris from the previous nesting. Therefore, regular attention to keeping the boxes cleaned after each nesting during the breeding season can increase the total number of ducklings produced from each box during any given year. This can increase the time for maintenance, but it is known to be worth the effort.

NEST BOX CONSTRUCTION

Nest boxes may be made from a variety of materials. However, untreated lumber should be used. The chemicals used in lumber pressure-treated with wood preservatives may be toxic to wood duck eggs or ducklings. Soft woods such as pine, cypress, cedar, or redwood are recommended because : 1) they can be worked easily, and, 2) they don't warp or crack as readily as hardwoods. Special nails or screws may be required for redwood and some types of cedar because these woods do not hold standard nails well. Plywood, even exterior grade, does not prove as durable as board lumber. Two coats of exterior paint should be applied if plywood is used for box material. Southern yellow pine is a good choice for nest boxes because it is inexpensive, available, and durable. Lumber dimensions of 1" x 10" or 1" x 12" are best.

An alternative method for extending wood durability is to construct nest boxes from untreated lumber, then apply a coating of exterior paint or wood preservative to the outside of the box.

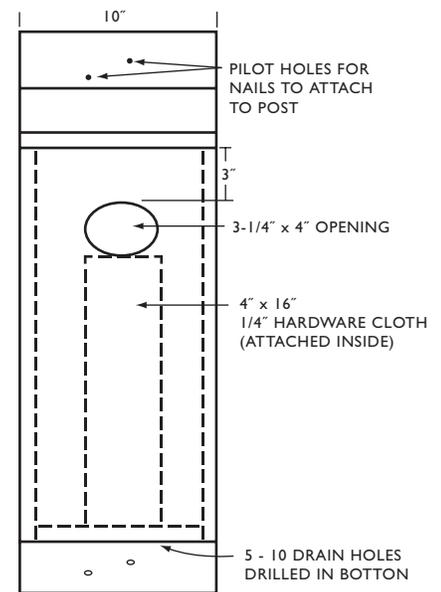
Nest boxes can be built with minimum tools. A hand saw, hammer, tape measure and carpenter's square are adequate. Naturally, power hand tools or shop tools would facilitate ease and speed of box construction. Box nails of 6-penny or 8-penny size are best. Drywall screws may be substituted for nails in softer lumber. Seams may be glued if this added quality is desired.

A construction plan for a nest box version recommended by the TPWD waterfowl program is shown in Figure 8. Study this plan carefully before beginning box construction. Be sure the hardware cloth "ladder" is attached securely inside the front of the box. This should be done before the front panel is nailed together with the sides, or, before the top is nailed on. A useful trick for the side door is to mark the door location, then nail the side into the place without cutting the door (be sure not to place nails through the door portion). Next apply the door hinge and the nails for wire fastening. You will find these steps provide a firm base for driving the hinge screw and the fastening nails.

After this has been done, a keyhole saw or power saw may be used to cut the door portion in the side. Some beveling at the side may be necessary if the door fits too snugly. A 4-inch diameter entrance hole should be cut if use by black-bellied whistling ducks is expected.

FIGURE 8

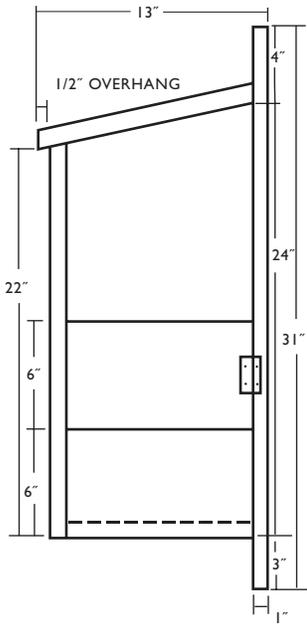
Construction Plan for a Wood Duck Nest Box



FRONT VIEW

Soft woods such as pine, cypress, cedar or redwood are recommended because:

- 1) they can be worked easily, and;*
- 2) they don't warp or crack as readily as hardwoods.*

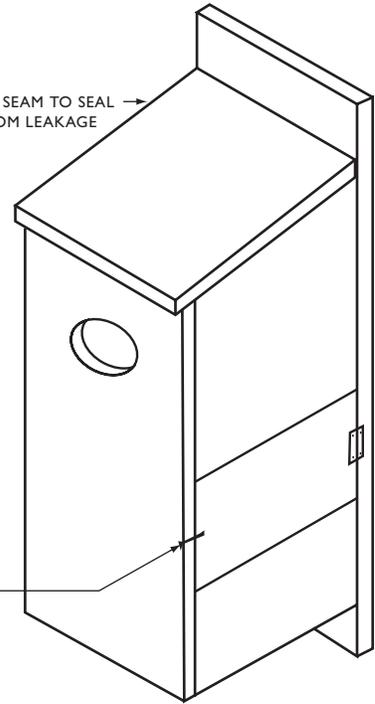


SIDE VIEW

USE 1" x 10" or 1" x 12"
UNTREATED SOFTWOOD LUMBER

WRAP WIRE AROUND NAILS
TO SECURE DOOR
IN CLOSED POSITION

CAULK THIS SEAM TO SEAL
THE TOP FROM LEAKAGE



SUMMARY



Photo: Kevin J. Kraai

Wood ducks in Texas are an important aspect of the wildlife community. Their uniqueness makes them valuable not only to hunters but also to birdwatchers or people who seldom encounter the exquisite beauty of this “native” Texan.

Furthermore, wood duck populations are a barometer of land use changes. Declines in wood duck numbers can serve as an indicator of loss of essential bottomland hardwood habitat. Because this ecosystem serves as an integral part of the overall landscape, steps need to be taken to minimize further losses. To aid this cause, every effort needs to be taken to ensure that wood ducks remain part of legacy of wildlife resources in Texas. Landowners and wildlife managers can contribute importantly by implementing sound land management practices through a well-planned habitat conservation and nest box program for wood ducks.

FIGURE 9

Wood Duck Production Habitat with Nest Box Installed



4200 Smith School Road
Austin, Texas 78744

Dispersal of this publication conforms with Texas State Documents Depository Law,
and is available at Texas State Publications Clearinghouse and/or Texas Depository Libraries