

NEW YORK'S WILDLIFE RESOURCES

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Wood Duck (*Aix sponsa*)

Description

One of our state's most beautiful and common species of waterfowl is the wood duck (*Aix sponsa*). Its current abundance in this state and throughout the Atlantic Flyway belies the precarious nature of its past; at the turn of the century wood duck numbers were so depleted that some people believed the species was nearing extinction. Conservation measures restored the wood duck, and today the characteristic "wee-e-e-ek, wee-e-e-ek" call of the hen can be heard on many of New York's ponds, marshes and creeks.

Identification of the wood duck is easy, for its shape and markings are distinctive. It is a medium-sized duck (see Table 1) with short, broad wings and a long, square-tipped tail; features that allow it to maneuver deftly through the forest. In flight, a white belly and characteristic tilt of the head, with the bill pointed downward, readily set this species apart from the rest of the state's ducks. Additionally, the wood duck's square tail and location of the wings, which appear to be in the middle of the body, help distinguish this bird from other ducks in flight.

Few birds have such beautiful form or exquisite color as the wood duck drake. Feathers on the crested head of the drake are various hues of purple and green, with two white lines extending from the base of the bill and back of the eye to the tip of the crest. A pair of white "fingers" reach up from the throat along each side of the head. A red iris (outer ring of the eye) and colorful bill complete the distinctive markings of the head. The chest is burgundy flecked with white, and the belly is white. The sides are bronze,

Table 1. AVERAGE ADULT DIMENSIONS AND WEIGHTS OF THREE NORTH AMERICAN DUCKS

Common Name	Length cm (in.)	Wing cm (in.)	Weight kg (lbs.)
Mallard	62.7 (24.7)	29.0 (11.4)	1.25 (2.75)
Wood Duck	50.8 (20.0)	22.6 (8.9)	0.68 (1.50)
Blue-winged Teal	39.6 (15.6)	18.8 (7.4)	0.46 (1.02)

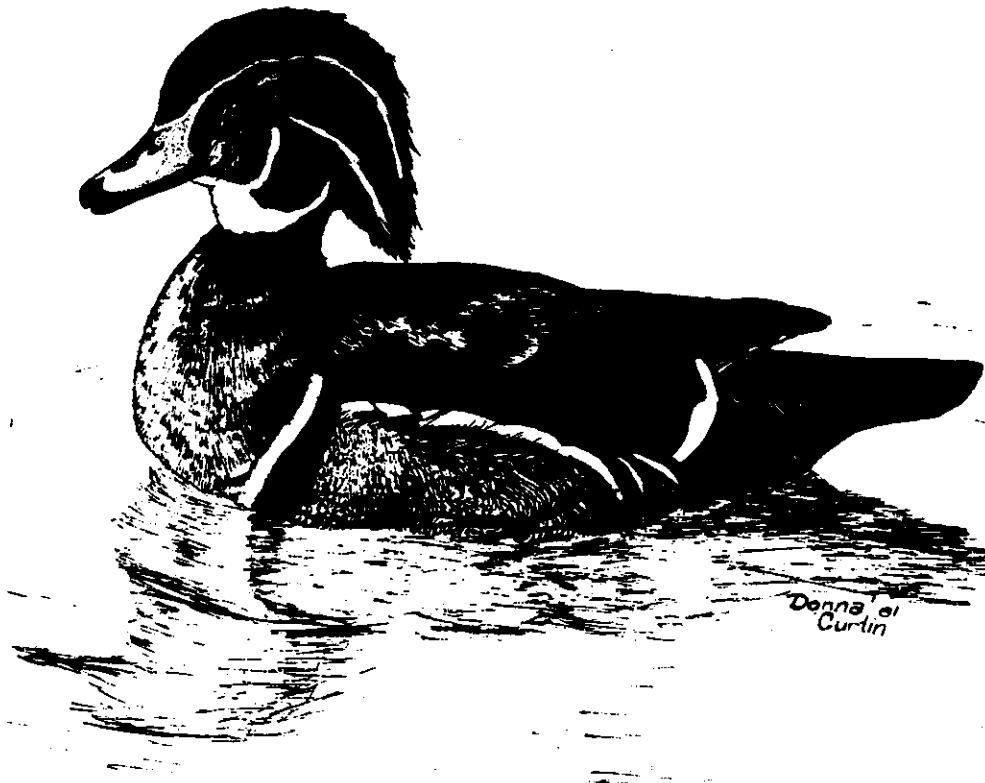
Adopted from Bellrose (1976)

bordered along the front edge by a black and white band. The back and tail contain various hues of purple and blue. The bluish speculum (wing patch) is lined along the back edge by a white band.

For a few weeks during the summer the drake's breeding plumage is replaced by what is known as eclipse plumage. This plumage remotely resembles that of the female, but the drake can still be distinguished by the white marking on the side of the head, red iris, and colorful bill.

Although more colorful than the hens of most waterfowl species, when standing beside her mate the wood duck hen appears rather drab. Like the drake she has a crested head, white throat and belly, and bluish speculum. A white band along the back edge of the speculum is also present but differs from that of the male in that the white markings are more rounded or "tear-shaped". The eye of the hen is blackish-brown, surrounded by a distinctive white ring that trails off toward the crest like the tail of a comet. The back, tail, and sides have a brown or olive-brown appearance. In flight, the wood duck hen can be confused with a baldpate hen, since they are of similar size and both have white bellies. However, the baldpate has longer, narrower wings, and carries its head in the same plane as its body, with its bill pointed straight ahead. Also, the wings seem to be set toward the rear end of the bird.

During much of the summer juvenile wood ducks resemble adult females, except that the belly of the juvenile is mottled with brown. By mid to late fall juveniles develop many adult markings, and by early winter they have acquired most of their adult plumage.



Distribution and Abundance

Wood duck breeding populations are found in three regions of North America: the Pacific coast, extending from southern British Columbia and northern Montana south through the coastal states to southern California; the Interior region, extending throughout the Mississippi River basin; and the Atlantic region, extending from New Brunswick west to southeastern Ontario and south to Florida. Wood ducks of the Atlantic region winter from Maryland south to Florida and west to Texas.

In New York State, the wood duck is nearly as abundant as the mallard. Although a 1971 estimate put the breeding population of wood ducks in this state at 40,000, accurate annual estimates of their populations are difficult to obtain. Their secretiveness and use of woodland habitats throughout most of the year have prohibited the development of reliable census techniques. The number of birds harvested by hunters from year to year is probably the best indicator of population trends. The wood duck was the most common duck

harvested in New York State in 1980 and ranks second or third in the bags of hunters in both the Atlantic and Mississippi flyways.

New York's wood duck population appears well distributed throughout the state. A number of factors have contributed to this comeback. These include: (1) the maturing of timber on abandoned farmland, resulting in more mast-producing trees and nest cavities; (2) the state's nest box program that has increased number of nesting sites; (3) the state's wetlands acquisition program (habitat preservation); and (4) the increase in the number of beaver flowages in the state (increased habitat).

Habitat

In general, the wood duck is an inhabitant of flooded bottomlands, beaver ponds, millponds and woodland marshes, creeks and rivers. One can make a thumbnail judgement of the suitability of a body of water for wood ducks by using the following criteria:

1. The waterway should be at least 4 hectares (10 a) in size. Although a hen and her brood could find more than enough food on 1 productive hectare, larger areas seem to be preferred.

2. The waterway should be wooded, or bordered by woods. The most obvious reason for this criterion is the need for nesting cavities. However, even in open marshes with nest boxes wood duck populations typically are low, suggesting that other factors are at work. The production of mast (nuts or other fruit) by many tree or shrub species may be one such factor. Mast is a favorite food of wood ducks.

3. The waterway where the brood is raised should be interlaced with emergent vegetation, such as cattail (Typha spp.), and lined with overhanging vegetation, such as willows (Salix spp.) and buttonbush (Cephalanthus occidentalis). Brood cover is needed for undisturbed foraging and escape from predators.

Life History

The breeding cycle of the wood duck starts in late October, when pair bond formation begins. Pairing may take place before the fall migration, but usually occurs on the wintering grounds. This allows individuals from breeding grounds thousands of kilometers apart to intermix with one another, which explains the wood duck's uniformity in size and markings throughout its range.

The courtship of the wood duck is quite elegant. The drake swims about the hen, bobbing his head up and down, and displaying his burgundy chest while uttering low throaty sounds. John J. Audobon described the courtship more romantically in this passage:

Observe the fine drake! How gracefully he raises his head and curves his neck! As he bows before the object of his love, he raises for a moment his silken crest. His throat is swelled, and from it there issues a guttural sound, which to his beloved is as sweet as the song of the wood thrush to its gentle mate. The female, as if not unwilling to manifest the desire to please which she really feels, swims close to his side, now and then caresses him by touching his fine feathers with her bill. . .

The drake remains with his mate longer than most ducks, usually until the eggs are pipped (cracked in the first stage of hatching). In fact, not only does he remain with the hen, but he is very attentive. He follows her while swimming and flying, and tags along behind her during the spring migration to the hen's breeding spot, which may be thousands of kilometers from the place he stayed the previous summer. The hen, on the other hand, exhibits exceptional homing ability, returning to the same pond or marsh -- and sometimes even the same nesting site -- year after year.

Wood ducks return to New York State in late March or April and begin nesting shortly thereafter. Hens have a tendency to return to a nesting site that yielded a successful hatching the previous year, so the search for a nesting site is often a short one for these particular birds. Occasionally, however, the search requires several hours or even several days, during which time the hen examines many potential sites. The drake accompanies the hen as she seeks a suitable nest site.

The hen's preferred nesting site is a cavity or nest box within 0.4 kilometers (0.25 miles) of water and 0.6-20 meters (2-60 feet) above the ground. Preferred cavities have an entrance of 64 to 122 square centimeters (10-19 square inches), a depth of 0.3 to 0.5 meters (10 to 19 inches), and a base of 250 to 310 square centimeters (40 to 49 square inches). The base must be covered with an accumulation of litter (wood dust, wood shavings, leaf bits, etc.) because the hen adds nothing to the cavity to support or cushion the eggs.

After the hen has found a suitable nesting site she begins laying eggs. The eggs are ovate and dull white, closely resembling those of a chicken. One egg is laid per day for 10 to 15 days. On the sixth or seventh day the hen

begins to cover the eggs with down plucked from her breast, so that by the time all the eggs are laid they are nestled in a pillow of down.

After all the eggs are laid they are incubated for about 30 days. The drake remains with the hen until 3 or 4 weeks into incubation, but does not attend to the eggs. During incubation the hen often leaves the nest for short periods during the day to feed and preen. As hatching time draws near, the hen's attachment to the clutch strengthens and her daily excursions away from the clutch become very brief. Two to three days before hatching the ducklings begin to scratch at their shells and pip (call out); the hen responds with low soft noises. The hatching of a clutch is remarkably synchronized; usually all ducklings break through their shells within a few hours of one another.

Wood duck ducklings are remarkably well developed upon hatching. After they hatch, the hen broods them for about 24 hours. She then leaves the nest, checks for danger, and calls out to them. The ducklings respond immediately, jumping at the entrance hole and peeping frantically. Each duckling pauses momentarily upon reaching the entrance hole, and then jumps to the ground or water below. The leap may result in a drop of as much as 20 meters (60 feet), but the ducklings are rarely injured by the fall. If the nest is on land, the hen waits until her ducklings are collected around her and then leads them to water.

Early in its life the wood duck duckling is covered with down and appears very similar to the young of many dabbling ducks. After about 3 weeks juvenile plumage begins to replace the down, and by 6 weeks this process is complete. Soon after the juvenile plumage is completed the young are abandoned by their mother. Often they gather with other juveniles to form small flocks. When 8 to 10 weeks old they are able to fly.

Ducklings eat mostly animal matter, especially the adult and immature stages of insects. Adults include in their diet large amounts of plant material, particularly fruits, nuts, and seeds, such as acorns, hickory nuts and mulberries. In fact, wood ducks eat more fruits and nuts than any other North American duck.

Although the mortality rate of wood ducks is generally high, at no time is it greater than during the first few weeks following hatching. On the average, a brood is reduced by 40% during its first 3 weeks. Numerous factors account for this mortality. When the nest site is far from water many members of the brood may die on the trek to water. Once ducklings are on the water they are

subjected to predation from owls, hawks, raccoons, foxes, weasels, snapping turtles and some fishes. The hen attempts to protect her young when she senses danger by freezing or heading for cover; her brood reacts similarly. If this proves insufficient to save her brood, she flies out to open water and begins to flop around on it, as if crippled. When the predator is attracted to her she leads it further and further from her young, then when at a safe distance from the brood she flies off.

The adult mortality rate, although not as high as that of young ducklings, is nevertheless higher than any duck for which sufficient data have been gathered. On the average, 60% of all flying young and 50% of all adults die each year. Hunting accounts for most of this mortality, but disease, lead poisoning, severe weather, accidental trapping and predation also contribute to annual losses.

Whereas mortality negatively affects the wood duck population through subtraction, another phenomenon, nest failure, negatively affects the population through omission. It is estimated that one-half of all wood duck nests in natural cavities end in failure. In New York State, destruction of nests by predators, especially raccoons and starlings, is the major cause of failure. Vandalism by humans and nest desertion also contribute to nest failure.



Fortunately, the wood duck exhibits behaviors that keep production high enough to offset high mortality and nest failure. First, wood duck pairs are able to nest close to one another (2-4 pairs/acre). This allows maximum use of existing nesting sites, which are often a limiting factor in production. Second, hens often renest if the first nest is destroyed. And third, hens frequently deposit eggs in the nests of other hens, a practice known as dump nesting. Dump nesting helps maintain production by allowing a dump nester's eggs to be incubated when they would otherwise perish, and by allowing a dump nester to renest on its own. As might be expected, dump nesting reaches a point of negative returns. When it results in a clutch size of over 20 eggs it tends to disrupt the incubation process and reduces production. Like the first two behaviors mentioned above, dump nesting is a successful strategy of production because of the wood duck's high intraspecific (within the species) tolerance; in this case, a wood duck readily accepts the eggs of other hens. Dump nesting occurs for a number of reasons. Usually it occurs because a predator destroys an unfinished clutch, forcing the hen to finish laying her eggs elsewhere. It can also occur when the number of breeding pairs in an area exceeds the number of acceptable nesting sites.

Ecological Role

Wood duck eggs often become a focus of foraging by predators. Raccoons, in particular, may destroy clutches by making "rounds" of favorite nesting cavities. As mentioned earlier, both juvenile and adult wood ducks may fall prey to a variety of opportunistic predators, making these ducks a part of local food webs.

Woodpeckers, particularly pileated woodpeckers, are responsible for many of the nesting cavities used by wood ducks. These birds seldom chisel out a cavity large enough for a wood duck to nest in, but they do expose the interior of trees to the processes of decay. Some tree species are prone to natural cavity formation (e.g., ash), making them important for wood duck nesting. Since the wood duck never prepares a site for nesting, "interior decorating" by such species as red squirrels, gray squirrels, raccoons, and other cavity nesters is also important. Another animal that is valuable to the wood duck is the beaver. The resurgence of the beaver in the northeast corresponds with the recent increase in the wood duck population in this region, and it is becoming evident that this is a cause-effect relationship. The beaver creates wood duck

habitat by flooding timberland when it impounds creeks and rivers. A study has shown that wood ducks prefer new beaver flowages, probably because these flowages often contain standing timber. Beaver flowages over 10 years old are less preferred by wood ducks because most of the trees have rotted and fallen.

Economic and Social Values

In one sense, the value of the wood duck is very high. More wood ducks are bagged annually in New York State than any other duck except the mallard, and wood ducks are excellent tablefare. In another sense, the value of the wood duck is immeasurable. How many people have seen the resplendent plumage of the drake and felt as Thoreau did when we wrote, "what an ornament to a river to see that glowing gem floating in contact with its waters!"

The beauty of the wood duck and its associated aesthetic values were almost lost forever. At the turn of the century its numbers had been so depleted that it seemed destined for extinction. A number of factors contributed to the wood duck's near demise, including market hunting, 6-month long hunting seasons, and nonexistent or extremely high bag limits. These factors originated from the accepted belief that natural resources, including waterfowl, were limitless.

New York State attempted to control the hunting of waterfowl as early as the 1830's, when legislation was introduced outlawing swivel punt guns, a device designed for multiple killing of rafted waterfowl. The first real step forward took place in 1900 when the Lacey Act became law. Among other things this Act attempted to reduce market hunting by making it a federal offense to cross state lines with game taken illegally. This was followed by the Weeks-McLean Law of 1913. This law put all migratory waterfowl under the jurisdiction and protection of the Federal Government. At the time the Weeks-McLean Law seemed vulnerable to a court challenge questioning its constitutionality, so backers of the law looked to other means to protect waterfowl. They seized upon the Federal Government's sovereign power to make treaty, and convinced the U.S. Government to negotiate a migratory bird treaty with Great Britain (of which Canada was a territory). On July 13, 1918 the Migratory Bird Treaty Act became law. It closed the season on wood duck and gave it full protection. By 1941 the wood duck population had recovered sufficiently to allow hunting on a limited basis.

Management

Because the wood duck is both an important game bird and a favorite species of bird-watchers, many people are interested in maintaining its numbers in this state. One way to maintain a healthy wood duck population is by regulating the harvest. It must be remembered, however, that manipulation of the harvest has only limited potential as a management tool. If the wood duck population were low due to overhunting, an adjusted season could be very effective in increasing the population. However, if the population were low due to a loss of habitat or nesting sites, manipulating the hunting season treats a symptom of the problem rather than the cause.

The preservation and development of wood duck habitat can be accomplished with surprisingly little effort. For the most part it involves allowing two processes currently occurring naturally in New York State to continue. One of these processes is timber maturation. As mentioned earlier, timber is a major component of wood duck habitat. Since the 1930's and 1940's when much farmland throughout the state was abandoned, the amount of forested land in the state has steadily increased. Of course, much of this timber will be harvested, but timber harvesters can contribute immensely to the preservation of wood duck habitat by leaving buffer strips around marshes, ponds, and creeks and by leaving cavity-prone snags that are within 0.2 kilometers (1/8 mile) of water.

The other natural process contributing to wood duck habitat development is the resurgence of the beaver. Beaver flowages are prime wood duck habitat, and it may be that the best way to manage wood ducks is to manage beaver.

Another way to maintain wood duck production in this state is to erect nest boxes. Anyone can construct and place a nest box, and often it becomes an enjoyable and rewarding hobby. The following guidelines should be followed by anyone beginning a nest box project:

1. Boxes should be built to acceptable specifications; a box built incorrectly may become a lunch box for predators. Numerous publications explain how to build one. A few of these are among the selected references listed at the end of this paper.

2. If boxes are not made of rough cut lumber, the inner front wall of the box must be fitted with hardware cloth to allow ducklings a foothold so they can climb to the entrance hole.

3. Since wood duck hens do not collect nesting material, the box must be provided with a 7.5 centimeter (3 inch) layer of sawdust and wood shavings.

4. Boxes should be predator-proofed from below by a metal shield with a minimum radius of 46 centimeters (18 inches). The box should also be placed so as to make it inaccessible from nearby branches.

5. Boxes should be placed over water, or within 0.4 kilometers (0.25 miles) of it. If placed over water, protective shields should be at least one meter (3 feet) above the high water table.

6. To prevent vandalism, boxes should not be placed in areas easily accessible to the public.

7. Boxes should be in place well before the nesting season, preferably by March 1st.

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*Contains instructions for nest box construction.