

BEHAVIOR AND CAPTURE OF WOOD DUCKS IN PECAN GROVES

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Abstract.—Wood Ducks (*Aix sponsa*) in the vicinity of Tishomingo National Wildlife Refuge, southern Oklahoma, flew from small wetlands to ponds in commercial pecan groves. Peak flights were in January, but occurred from December through March. Wood Ducks fed on high-energy pecan mast dropped by commercial harvesters and mast that fell later in the year. Eighty-two ducks were captured with cannon nets placed in the walkways used by the birds to enter the pecan groves. Capture efficiency (8% of birds in front of the nets) compared favorably with other means of capture. Account should be taken of pecan groves in management schemes for Wood Ducks. Suggestions for grove management and for capture of Wood Ducks in these upland sites are provided.

COMPORTAMIENTO Y CAPTURA DE *AIX SPONSA* EN SEMBRADOS DE PACANAS (*CARYA ILLINOENSIS*)

Sinopsis.—Patos (*Aix sponsa*) de la vecindad de el Refugio Nacional Tishomingo (Oklahoma), se mueven de lugares anegados a charcas localizadas en áreas cultivadas con pacanas. Los movimientos ocurren entre los meses de diciembre a marzo con un pico en enero. Los patos se alimentan de la bellota de la pacana que no es recogida de los suelos y de la que cae de los árboles. Utilizando redes de cañon se capturaron 82 aves cuando estas entraban a los sembradíos. La eficiencia de captura resulto ser 8% lo que compara favorablemente con otros métodos de captura. La siembra de este tipo de nuez debe ser tomada en consideración para planes de manejo de esta especie de pato. Se ofrecen sugerencias al respecto.

Loss and degradation of habitat is the major waterfowl management problem in North America (Canadian Wildlife Service and U.S. Fish and Wildlife Service 1986). This is particularly true for the Wood Duck (*Aix sponsa*), which despite recent population gains, is dependent upon lowland forests and riparian zones, both of which have undergone substantial loss (Delnicki and Reinecke 1986, Tiner 1984). Management of remaining habitat for waterfowl has thus come to emphasize provision of a mix of food, cover, and freedom from disturbance, and an emphasis upon meeting seasonal energy requisites through intensive management, e.g., moist soil impoundments (Fredrickson and Taylor 1982) and green-

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tree reservoirs (Mitchell and Newling 1986, Rudolph and Hunter 1964). The key to Wood Duck presence is the availability of easily acquired high-energy foods (Hallett and Fredrickson 1980), but much is still unknown of food requirements and feeding behavior of the Wood Duck (Drobney and Fredrickson 1979).

Feeding on mast is a well known trait of Wood Ducks (Briggs 1977, Hall 1965) and their preference for acorns over other foods is well documented (Allen 1980, Landers et al. 1977, Palmer 1976). Management of mast crops is thus a means to provide high quality Wood Duck habitat (Brakhage 1966) and the occurrence of mast-producing species can be used to predict fall distribution of Wood Ducks (Jahn and Hunt 1964: 73). In this paper, we document, for the first time, Wood Duck use of a new mast-producing habitat, commercial pecan (*Carya illinoensis*) groves, and present results of several trials in which we observed Wood Duck feeding behavior and evaluated the feasibility of capturing and banding Wood Ducks.

STUDY AREA

During winter, 1969–1970, we monitored daily Wood Duck movements in the vicinity of Tishomingo National Wildlife Refuge, Johnston Co., Oklahoma, as a means to locate additional flocks for trapping and banding. Cottonwood Pond, a narrow 8-ha wetland containing stands of flooded immature black willow (*Salix nigra*), common buttonbush (*Cephalanthus occidentalis*), eastern cottonwood (*Populus deltoides*), and American sycamore (*Platanus occidentalis*), was used nightly in December by about 1200 Wood Ducks and smaller numbers of Green-winged Teal (*Anas crecca*), Mallard (*Anas platyrhynchos*), and Gadwall (*Anas strepera*). Many birds departed for feeding and loafing areas at sunrise. Large flights of Wood Ducks also departed each evening at sunset. These northeasterly flights were followed 2.5 km to a small (0.1 ha) pond located in a 30-ha pecan grove. The pond was enclosed on three sides by a 2-m high dike and ground cover was grazed, 6–8 cm common Bermuda grass (*Cynodon dactylon*). Topography was essentially level.

METHODS

Two cannon nets (18 m × 12 m with 2.54-cm nylon mesh) were set on the two main trails beyond the dike used by Wood Ducks on this small pond. The nets were camouflaged with dried grass and the detonator was located 55 m south in a dense hardwood stand. Early trials using duck decoys on the water or land had little or no perceptible effect upon the birds, but imitated Wood Duck calls caused flocks to land earlier. Since the birds attracted to the calls landed near the caller and not near the nets, use of both decoys and calls was discontinued.

At first, we used the standard bait for our banding operations at Tishomingo, shelled corn (*Zea mays*). This bait was consumed at the water's edge but not on dry land in front of the nets. Pecans (approximately 13

kg spread in the vicinity of the net) were then tried and successfully attracted and held feeding birds long enough for nets to be deployed.

Our previous experience with cannon net capture of Wood Ducks had shown that large groups of birds in the net quickly escaped if not immediately restrained by the banding crew. Since we had to run 55 m to the net site, we only fired the net when the number of birds potentially in range was small enough for our group to reach before they struggled free. Thus, although we made six observations of the response of Wood Ducks to the trap site, we only captured a small fraction of the birds passing in front of the net.

RESULTS

Behavior.—The evening flight of Wood Ducks into the small pond in the pecan grove began at about 10 min before sunset with peak numbers of birds arriving at sunset in a 5-min period. A peak flight of 2000 Wood Ducks entered the pecan grove on 14 Jan. 1970. Each evening, as the pond's small surface became covered with birds, the Wood Ducks massed at the low west dike, then in a concerted movement, crossed the dike and entered the pecan grove. Ducks in front of the flock moved 18–180 m before stopping to feed. Ducks at the rear sometimes flew over the leaders to land in open sites. On several occasions, birds landed directly in the grove. Feeding birds were usually distributed over the entire stand of pecans.

Although most of the pecan crop had been harvested for human consumption in Nov. and Dec., a substantial quantity of mast was available from pecans that dropped later. Close observation showed that some Wood Ducks had difficulty swallowing the large pecans, but each bird ingested an average of 5–8 pecans in a 10-min feeding period. As birds completed feeding, they departed in small flocks with necks noticeably swollen from the mass of pecans.

Flights into pecan groves continued from Dec. into Mar. Feeding in the pecan groves was interrupted only when the ponds were intermittently frozen for short periods. In searches of the surrounding area, we discovered several other farm pond-pecan grove complexes that received similar, albeit smaller, flights of Wood Ducks. Several groves without ponds were used by Wood Ducks on an irregular basis.

Capture.—We visited the pecan grove pond irregularly, but distributed bait during all periods of open water. On the 6 evenings that we manned the cannon nets, at least 2016 Wood Ducks landed on the pond and moved into the pecan groves. Additional birds landed in the grove and nearby fields. A continuous stream of birds passed in front of the net as they moved up the well-worn trail over the dike and into the trees. Individual birds, however, fed in front of the nets for only 30–60 s before moving into the pecan grove. Of the birds passing in front of the net on 6 occasions, we estimated that 1116 were potentially within range of capture. We fired the net three times, capturing 12, 33, and 37 Wood Ducks in the rear of the flocks crossing the dike.

Despite the disturbance of firing the cannon net, birds that flushed landed again within 100 m of the nets. Birds 200 m away did not flush. After the net was fired, Wood Ducks remained wary of the specific net site for several days.

DISCUSSION

We are not aware of previous reports of Wood Ducks feeding on pecans, even though this mast crop is commercially important and a widely cultivated species. Wood Duck use of other hickories (*Carya* spp.) as food is known, but hickories and several other mast species seem to be used largely where the more preferred acorns are not available (Bellrose 1976: 194). Martin et al. (1951:298) suggested *Carya* spp. might form 5–10% of the diets of Wood Ducks in the Southeast, but quantitative data on use of hickories by Wood Ducks are few. Rawls (1955) reported 2.6% (total volume) *Carya* spp. in Wood Ducks from Reelfoot Lake, Tennessee (3 of 36 birds with hickory mast), and McGilvrey (1966) found 5.5% *Carya aquatica* by volume in the gizzards of Wood Ducks collected at Lake Marion, South Carolina (4 of 108 birds with hickory mast). Hickory kernels are exceptionally high in crude fat and intermediate in crude protein, phosphorus, and calcium levels (Halls 1977, Short and Epps 1976). They are low in fiber and thus are highly digestible and high in energy content, making them a very suitable food for waterfowl.

Assessment of Wood Duck habitat quantity and quality should address the value of commercial nut groves, especially if near water. Constructing small (0.1–0.2 ha) ponds in otherwise dry pecan stands will substantially increase the value of such areas to waterfowl. Because mast in rank vegetation is largely unavailable to ducks, mowing or close grazing appear to be necessary prerequisites to use of pecan groves by ducks. Additionally, the successful capture of feeding Wood Ducks with cannon nets provides another means to band these birds after the breeding season. Although rocket or cannon nets have been used elsewhere to capture Wood Ducks in late summer and autumn using grain bait near small ponds (H W Heusmann and C. Shaw, pers. comm.), we are not aware of successful use of mast as bait for Wood Ducks.

Tolle and Bookhout (1974) recently compared drive trapping and mist netting as alternative means to bait trapping for capture of Wood Ducks. They caught approximately 5% of the birds present in roosts with these methods. In our study, using cannon nets in the pecan groves, we captured 82 of 966 (8%) of the birds passing in front of the nets on the day they were deployed. In comparison to the netting methods evaluated by Tolle and Bookhout (1974), the manpower requirements and set-up time for cannon or rocket netting is substantially less. All three methods may require working in the dark and substantial effort to locate roosting and feeding areas, difficulties that have had much to do with the small number of banded Wood Ducks obtained. Various techniques including all of those listed above as well as other methods suitable to particular circumstances such as night lighting (Gilmer et al. 1977) will remain major

techniques for banding, but comparative efficiencies will always vary between sites and seasons. Because of its efficiency, we therefore propose that cannon/rocket netting at evening feeding sites be considered a part of post-season Wood Duck banding programs.

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