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INCREASING A WOOD DUCK NESTING POPULATION BY RELEASES OF PEN-REARED BIRDS

By FRANK B. McGILVREY
U. S. Fish and Wildlife Service
Patuxent Wildlife Research Center
Laurel, Maryland

ABSTRACT

There is a growing interest in the use of pen-reared wood ducks *(Aix sponsa)* for establishing or increasing box-nesting populations in local areas. During a 3-year period (1967-1969), 67 pen-reared hens were released on the Patuxent Wildlife Research Center, Laurel, Maryland. These releases substantially increased the nesting population. Total population averaged less than 30 hens annually with a recruitment rate averaging less than seven between 1963 and 1967. Between 1968 and 1971, the nesting population averaged about 80 hens. Annual recruitment averaged 29 between 1969 and 1971. Pen-reared hens were as successful as wild hens in hatching and rearing young. Mortality was lower among pen-reared hens than wild hens, due largely to the sedentary behavior of the pen-reared hens. Production of young to flight stage increased from an average of about 100 per year prior to the releases of pen-reared hens to about 430 annually after the last release in 1969.

Pen-reared wood ducks (*Aix sponsa*) have been released in a number of areas in the past 25 years in attempts to establish populations where the birds were absent, or to augment populations below the carrying capacity of the habitat (McCabe, 1947; Hanson, 1951; Grayson and Grayson, and 1959; Hunt and Smith, 1966). In a comprehensive review of these experiments, Lee and Nelson (1966) concluded that the data, though inadequate from these many small-scale releases, were encouraging enough to suggest the desirability of more in-depth studies. Recent interest in this technique has been particularly evident in the Southeast where the Division of Refuges, Bureau of Sport Fisheries and Wildlife,

released pen-reared wood ducks on several refuges (Lane, Bond, and Julian, 1968). These releases have resulted in establishment or increased populations on at least five national wildlife refuges.

Several studies of wood duck ecology have been conducted on the Patuxent Wildlife Research Center near Laurel, Maryland, since 1963 (McGilvrey, 1969; and McGilvrey and Uhler, 1971). Although the habitat was excellent and brood rearing success good, nesting populations declined from 1963 through 1966 as recruitment of young hens failed to exceed losses of older birds. I released 67 pen-reared hens and 72 pen-reared drakes prior to the nesting season in 1967, 1968, and 1969. This paper discusses the impact of these releases on the nesting populations in subsequent years through 1971.

METHODS

Eggs were taken from dump nests in boxes on the Center and hatched in an incubator. The ducklings were reared with young black ducks of comparable age. This rearing method surmounted the nonfeeding and climbing problems encountered by other propagators. No effort was made to imprint the birds to nest boxes. The young birds were released the following spring in the vicinity of the rearing pens. Each year, approximately 130 horizontal, starling-deterrent nest boxes on posts (McGilvrey and Uhler, 1971) were available for nesting. There are 20 impoundments totaling about 200 acres on the Center, but most of the nesting takes place on a chain of seven shallow impoundments totaling 100 acres.

A study of nesting box preferences and brood rearing success provided the opportunity to gather information on the survival and nesting success of the pen-reared birds and to compare survival and success to that of wild wood ducks. Nesting hens were captured in the boxes and marked with either multi-colored plastic streamers pinned to the back of the neck or with plastic nasal saddles. This marking made it possible to identify hens with their broods. Small bait traps were used to capture ducklings for banding in late summer. Those bandings helped to identify yearling hens caught in nest boxes the following year and have provided data on locations of harvest areas.

RESULTS AND DISCUSSION

The three most significant findings of this study are:

1. The high productivity of the pen-reared hens after their first year;
2. The high survival rate of the pen-reared hens compared with that of wild hens; and
3. The rather dramatic increase of the nesting population apparently resulting from the reproductive success of the pen-reared hens.

Table 1 presents the results of productivity studies of the pen-reared hens. Yearling hens (pen-reared or wild) raised few young. Their ability to hatch and rear young improved considerably after the first year. It was not until the third year after the initial release that pen-

TABLE 1. Reproduction by pen-reared hens at Patuxent.

Year	Hens released	Number found nesting*	Complete clutches	Clutches hatched	Young hatched	Estimated young reared
1967	19	7	7	5	24	5
1968	12	16	19	17	145	60
1969	36	38	44	42	338	135
1970	0	31	36	32	312	200
1971	0	20	29	27	261	140

* Includes surviving hens from previous releases.

reared hens began to have a significant impact on the population. By 1969, 15 of the 38 pen-reared hens were at least 2 years old. At the time of the last release in 1969, pen-reared hens contributed one-half of the box nesting population and about one-half of the total production. Production in 1969 by 38 hens averaged 3.6 young reared per hen. In 1971, when all 20 hens were at least 3 years old, production to flight age equalled that of 1969 and young reared averaged 7.0 per hen. Seven of the hens nested twice in 1971 and six hatched two broods.

The greatest loss of pen-reared birds is believed to have occurred immediately after release and before they attempted to nest. After these initial losses, mortality was very low in succeeding years. Eight of the 19 hens released in 1967 were found nesting that year. Five of these eight hens were still present in 1971. Nine of the 12 hens released in 1968 nested that year and five were alive in 1971. The last and largest release in 1969 had the lowest survival; 23 of the 36 hens nested in 1969 and 10 were still present in 1971.

Wild wood ducks generally migrate from Patuxent in October. Band recovery rates indicate a high harvest rate in the Carolinas. In contrast to the wild birds, the pen-reared hens showed little inclination to migrate. Except for brief periods of severe winter weather when impoundments were ice-bound, they remained on the Center year around. This sedentary tendency may have been responsible for their low mortality.

Weekly surveys indicate that many wild-reared birds now winter with the pen-reared wood ducks on the Patuxent Wildlife Research Center. During the winters (December-February) of 1963-64 through 1967-68, wood ducks averaged only 108 duck-days use of the Patuxent ponds. In the winters of 1968-69 through 1970-71, they averaged 5,350 duck-days use.

The impact of the release of pen-reared wood ducks on the nesting population is presented in Tables 2 and 3. In the first 2 years of releases,

TABLE 2. Reproduction by wild hens nesting in boxes at Patuxent.

Year	Number found nesting	Complete clutches	Clutches hatched	Young hatched	Estimated young reared
1964	29	32	25	220	105
1965	35	38	34	354	125
1966	22	24	15	130	60
1967	23	25	18	198	110
1968	26	29	23	209	100
1969	39	39	34	295	115
1970	80	83	73	645	300
1971	86	101	74	716	400

TABLE 3. Total wood duck nesting in boxes at Patuxent Wildlife Research Center, 1964-1971.

Year	Number found nesting	Complete clutches	Clutches hatched	Young hatched	Estimated young reared
1964	29	32	25	220	105
1965	35	38	34	354	125
1966	22	24	15	130	60
1967	30	32	23	222	115
1968	42	48	40	354	160
1969	77	83	76	633	250
1970	111	119	105	957	500
1971	106	130	101	977	540

the only obvious effect on the total population was an increase in the number of nesting hens. Total young produced by all hens jumped substantially for the first time in 1969. This was also the first year since the study began that wild yearlings made up a substantial proportion of the nesting population (Table 4). The 1969 and 1970 wild yearlings had a very high rate of survival in succeeding years. As older breeders, their rearing success increased greatly and production jumped from the average of 100 for 1964 through 1969 to 400 in 1971.

TABLE 4. Ages of wild hens caught in nest boxes at Patuxent.

Year	Ages in Years 1	2	3	4+	Total caught
1964	8	7	8		23
1965	0	10	13		23
1966	5	3	3	7	18
1967	4	4	1	9	18
1968	8	3	4	5	20
1969	25	4	1	6	36
1970	38	25	3	4	70
1971	24	30	17	5	76

Of a total of 74 known age hens, wild and pen-reared, in the population in 1969, 48 (65 percent) were yearlings and productivity averaged 3.3 young per hen. In 1971 only 25 percent of the 96 known age hens were yearlings and productivity increased to 5.4 young per hen.

The momentum of increased production began to level off in 1971. However, the increased number of older hens in the population resulted in more young reaching flight age in 1971 than in 1970 although the nesting population was somewhat smaller (Table 3).

CONCLUSIONS

The release of a small number of pen-reared wood ducks over a 3-year period had a very positive impact on the subsequent size of the breeding population and production on the Patuxent Wildlife Research Center. The number of hens using nest boxes increased from a low of 22 in 1966 to 111 in 1970. Production of young to flying increased from 60 to 540 in 1971. Modified migration behavior apparently resulted in higher survival of both pen-reared and wild breeders. This study suggests that pen-reared wood ducks are highly adaptable to the wild under favorable habitat conditions, and that small numbers of released birds can significantly increase sparse breeding populations.

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PONDS AND LAKES OF THE LOUISIANA COASTAL MARSHES AND THEIR VALUE TO FISH AND WILDLIFE

By ROBERT H. CHABRECK
Louisiana Cooperative Wildlife Research Unit
Louisiana State University
Baton Rouge, Louisiana

ABSTRACT

A survey of the Louisiana Coastal Area disclosed that ponds and lakes made up one-fourth of the area. The ponds and lakes ranged from less than 0.01 acre to over 400,000 acres and numbered 5.3 million. The study shows that the fresh, brackish and intermediate marshes were of high value to waterfowl because of high pond density and plant growth. Ponds and lakes in the saline marshes were of low value to most waterfowl, but of extreme importance to marine organisms.

INTRODUCTION

The broad, flat coastal region of Louisiana is one of the unique areas of the world. The vast marshes, interlaced with bayous, ponds and lakes, combine to make the area extremely productive for fish and wildlife. Ponds and lakes add tremendous diversity to the region and serve as concentration areas for the energy flow from adjacent marshes.

Tidal ponds and lakes are important nursery and feeding grounds for many marine organisms. Ponds and lakes are extremely important for ducks and coots (*Fulica americana*), and the wintering populations using such areas number several million. Alligators (*Alligator mississippiensis*) plus valuable fur-bearing animals, such as mink (*Mustella vison*) and otter (*Lutra canadensis*) depend on ponds and lakes for a livelihood. Also, nutria (*Myocastor coypus*) are closely associated with water areas, and often use ponds and lakes for escape and travel lanes, and aquatic vegetation for food. Wading birds and shore birds along the Louisiana coast depend heavily on ponds and lakes for a source of food.

In spite of the value of ponds and lakes to fish and wildlife along the Louisiana Coast, no detailed sampling has been done to determine their distribution and characteristics.

A survey was made of the Louisiana Coast in August 1968, to determine surface features, vegetation, and soil and water conditions. A study of ponds and lakes was included as a part of the survey, and this report presents the results of that segment. The number of ponds and lakes is presented by size classes for each hydrologic unit and vegetative type along the coast, and vegetation is described for ponds of different areas.

Ponds and lakes may be defined as bodies of water nearly or entirely surrounded by land. For the purposes of this study the terms ponds and lakes were used synonymously in many instances. Generally ponds are considered to be small bodies of water and lakes large bodies, but in this report no attempt was made to differentiate between the two. Kniffen (1968) described seven types of lakes in the Louisiana Coastal Marshes separated on the basis of origin. Bays are large bodies of water adjacent to the Gulf of Mexico, very often appearing as a part