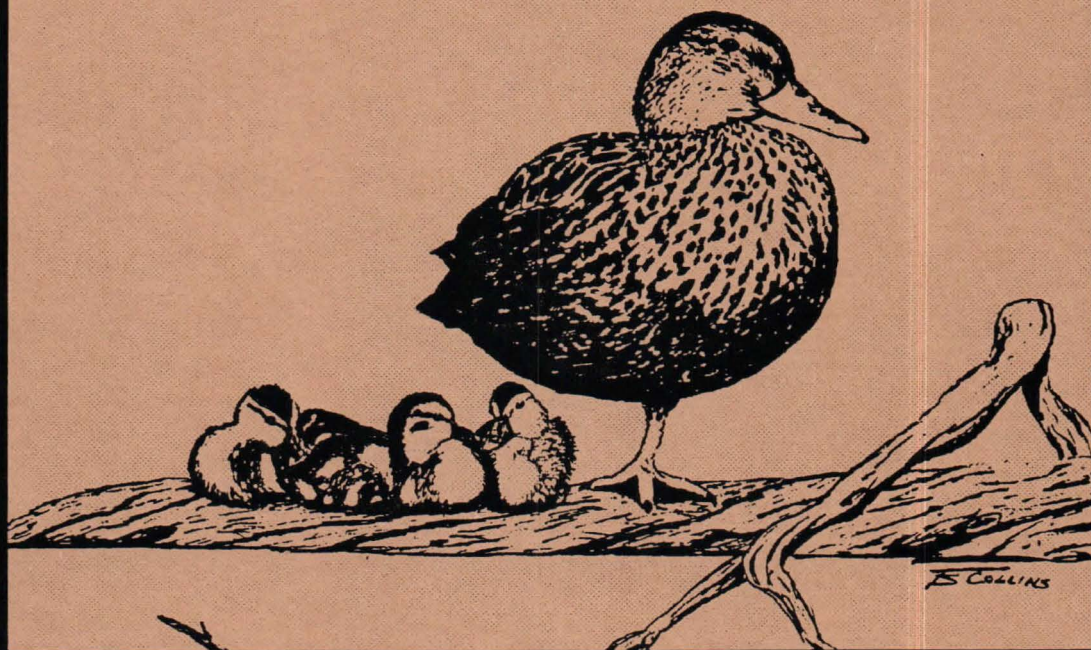


# Exclude Predators with Waterfowl Nest Structures

A Mid-Continent Waterfowl Management Project

*Sixth in a series describing  
management practices beneficial  
to waterfowl.*



**Exclude Predators**  
**With**  
**Waterfowl Nest Structures**

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*A Mid-Continent Waterfowl Management  
Project Activity Report*

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## **Introduction**

This report is one in a series that describes the work of the Mid-Continent Waterfowl Management Project (MCWMP). Each report in the series presents a management activity which can be used at the prerogative of waterfowl managers to produce more ducks. MCWMP is funded by the U.S. Fish and Wildlife Service (Service) and under the direction of a steering committee composed of personnel from the Service, the Minnesota Department of Natural Resources (MnDNR) and the Wildlife Management Institute (WMI).

Four long range goals were established for the pilot program. (1) Protect the existing wetland habitat in private ownership. (2) Create and/or restore wetland habitat on private land. (3) Establish upland nesting cover on private land. (4) Improve wetland and upland habitat now in public ownership regardless of the agency having control. (5) Improve nest success.

Staffing of MCWMP began in Fergus Falls, Minnesota, in 1978 when Carl Madsen entered as Project Leader; a position he held until May 1988. Rick Dornfeld started as Assistant Project Leader in 1984 and became Project Leader in May 1988. Hal Doty has served as a Wildlife Biologist since 1979, first on assignment from Northern Prairie Wildlife Research Center (NPWRC) and later as a MCWMP staff member. Jim Piehl began as a Wildlife Biologist in 1984; a position he still holds. Tony Rondeau has held the position of Biological Technician since 1979. Jim Neaville was a Wildlife Biologist from 1978 through 1984. Elizabeth Rockwell was a Wildlife Biologist on the project from 1983 through 1984.

## **History**

The Mid-Continent Waterfowl Management Plan included the management activity entitled "Exclude Predators with Nest Structures." The goal of the activity was to install and maintain 500 nest structures in the pilot area (Otter Tail, Grant, and Douglas counties). Output measures were defined as 1) number of nest structures installed, 2) dabbling duck nest densities, 3) success rates of nests and hens, and 4) number of breeding pairs.



The plan specified construction of 300 closed-top structures for use in woodland and parkland zones and 200 open-top structures for use in the prairie zone. Installation of structures was to be accomplished in seasonal, semi-permanent, and permanent wetlands on State and Federal sites with possibly some to be placed in privately-owned wetlands. Installation, maintenance, and evaluation work was to be shared by the U.S. Fish and Wildlife Service (Service) and the Minnesota Department of Natural Resources (MnDNR).

Changes were enacted in the plan as the project activity was being performed. A decision was made by the Service and MnDNR to place 500 open-top nest structures in marshes on private farms only in the prairie habitat zone. This eliminated the need for construction of closed-top nest structures and their placement in woodland and parkland region wetlands.

Research findings have shown that female mallards that have been successful in nesting are not likely to be diverted to different nesting habitats in subsequent years. Migrational homing to sites of prior year nest success by female mallards is the rule and not the exception. The present day condition of low nest success in the Prairie Pothole Region places most female ducks into the category of unsuccessful nesters that search for new situations for renesting. Nest structures for ducks can provide an additional option for those previously unsuccessful nesters and for the inexperienced yearling females. Records of duck nesting in structures have previously shown that nest success is generally much higher than in nearby habitats.

## **Project Design**

In 1982, the MCWMP developed a plan to install and maintain 500 nest structures in the three-county project area. The structure design was new but weld wire, steel rods, and water pipe support posts were materials similar to that used for construction of open-top wire basket nest structures. This newer style structure was termed the open-top rectangular wire nest structure. Approximately 250 were built by Service personnel at Fergus Falls WMD in 1982 and installed before the 1983 nest season for a 4-year trial. Another 250 were built in 1983 and installed before the 1984 nest season. All 500 were placed in wetlands on privately-owned farms in the prairie zone. Improved features of this structure were, (1) use of inexpensive construction materials, (2) potential to easily modify

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them by attachment of overhead roofing arches to protect duck eggs from possible destruction by avian predators, and (3) to discourage use by Canada geese due to their smaller dimensions.

The nest structures were placed in wetlands in each of the pilot area counties; 50 in Douglas, 200 in Otter Tail, and 250 in Grant. From 1983 to 1986 the rates of use were 16% in Douglas, 3% in Otter Tail, and 8% in Grant. Structure density did not exceed 12 per square mile in Douglas or Otter Tail, but rose to more than 30 per square mile in Grant. Nest success is summarized in Table 1.

The Grant County location was contained in Macsville township where an effort to "saturate" the wetlands with nest structures was attempted. That area was rather typical of private farms locally in providing scant amounts of nest cover. The dense placement of nest structures was intended to accommodate an anticipated expanding breeding population in years following successful nesting. While the rate of nest structure use increased gradually over the 4-year period (from 1% in the initial year to a 4-year average of 8%), it was determined that the "saturation" concept was quite wasteful of equipment and labor. A low density placement of nest structures over a wide area could be a more efficient method. With this situation, the density of structures could be gradually increased over years where the successful use of nest structures was observed.

Nearly all structures were set in permanent and semi-permanent wetlands. The preferred placement would have been in seasonal wetlands, but most of those on private farms were previously drained. Seasonal wetlands are much more plentiful on Service and MnDNR lands where nest structures had originally been identified for citing. Most landowners that had natural wetlands were willing to grant permission to place nest structures on their farms. Some of them stated that they did not want more nesting geese. They were informed that the open-top wire rectangular nest structure was designed to discourage use by geese due to its small size.

Another positive outcome of the nest structure activity was renewed interest in this management proactive with the result that Ducks Unlimited, Inc. (DU) elected in April, 1986, to contract for and provide funds for the purchase of 1,000 duck nest structures. Those structures were supplied to Agassiz National Wildlife Refuge and Detroit Lakes, Fergus Falls, Morris, and Litchfield WMDs. These nest structures were the same shape and size as open-top wire nest baskets but were constructed of fiberglass. Steel pole mounting posts were the same as those previously used, but attachment was by direct threading to metal flanges bolted to baskets. Surfaces inside the fiberglass baskets were roughened to

provide footing for ducklings. Internal metal eyelets permit wiring firmly the base layers of nest material without wrapping retainer wires around the outside vertical dimension of the basket.

The DU duck nest structure is currently the best one to use in the prairie region since it incorporates predator exclusion features. Attachment of arched overhead visual screening could be a possible future need if predation by gulls or other avian predators should become a problem. The outer surface of the baskets is hard and smooth and should help deter climbing by mammalian predators as will the direct threading of the baskets to mounting poles. However, it is essential to apply heavy grease to the metal threading and prevent damaging the threads with post drivers.

## Conclusions

Output measures for this MCWMP activity were achieved and/or are being met. The number of nest structures installed exceeded the 500 identified in the plan and nest density among structures along with nest success were determined by post-season field examinations and analysis. The number of breeding pairs of ducks in the MCWMP pilot area was sampled over 4 years, 1979-82, on randomly selected quarter sections.

The MCWMP pilot area was on the eastern fringe of the recommended area for using open-top nest structures. While the degree of response by mallards to nest structures was relatively small (Table 1), the high rate of nest success may justify their maintenance there as a technique to increase duck production. It had been found in 1960's trials in high quality wetland areas mainly in North Dakota that 38% of nest structures were chosen as nest sites by mallards and success was often 80-90%. Structure placement in those trials was generally such that densities seldom exceeded 4 to 12 per square mile. The rate of use with that pattern of placement ranged from 20% to 60%.

Predation rates were not excessive during the MCWMP activity but higher rates have been reported from other regions. The low rate of structure occupancy for duck nesting in the MCWMP was probably the result of many factors. These include, but are not necessarily limited to, (1) comparatively low density breeding duck populations on farmland wetland habitats, (2) the placement of large numbers of nest structures probably greatly exceeded the numbers of nesting

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mallards within those farmland locations, and (3) being in a low utilization fringe area as noted in prior field trials.

The number of hatched mallard nests in structures was impressive even with the relatively low rate of use. This was especially apparent when the numbers were viewed alongside MCWMP nest data that indicated each successful mallard nest in upland grassland required 80 to 200 acres in the prairie zone. The mallard model developed and under refinement at Northern Prairie Research Center indicated that the use of nest structures is an economically sound method to produce mallards. Nest structures could be included among management techniques intended to increase duck production.

During operation of the MCWMP nest structure demonstrations, it became very apparent that flooding in spring and summer can be extremely damaging to hens with their nests located in these structures. This problem resulted primarily when structures were placed in semi-permanent and permanent wetlands that were generally interconnected through intermittent streams or drainage tiles. This condition often prevails on private farms in the Minnesota prairie pothole region.

After the trial nest structure projects during the 1960's in the Prairie Pothole Region, long-term commitments by individuals, sportsmen's groups, and even professional agencies was usually lacking. It is easy to allow this activity to slip into nonuse and neglect as was previously noted. But interest in the use of nest structures has again developed since demonstration trials were initiated in the MCWMP pilot area in 1979. The DU contribution provided a major impetus to the practice of using nest structures as a means of increasing mallard production. New research is also underway which includes improving the design of structures.

Hundreds of duck nest structures are currently being built, purchased, and placed in wetlands with the assistance of State and Federal agencies in the Dakotas, Minnesota, in prairie Canada, and elsewhere. Professional wildlife organizations, wildlife club members, interested farmers and ranchers, and other individuals are participating actively in organized or independent nest structure projects. The MCWMP can be partially credited with this resurgence of a positive duck production technique.



Table 1

Record of Nest Structure Use in MCWMP 1980-86

Year	Horizontal Cone	Style Checked Usable (n)		Total
		Open-top wire Round	Open-top Wire Rectangular	
1980	10	0	0	10
1981	10	24	0	34
1982	10	24	0	34
1983	10	24	240	274
1984	0	21	353	374
1885	0	20	278	298
1986	<u>0</u>	<u>0</u>	<u>248</u>	<u>248</u>
Total	40	113	1,119	1,272
Nests(n)				
Mallard	0	15	75	90
Canada goose	<u>0</u>	<u>6</u>	<u>2</u>	<u>8</u>
Total	0	21	77	98
% Use of Structures				
		19	7	8
% Nest Success				
		100	93	93

<sup>1</sup>Five nests were destroyed by predators. Nest failure from flooding (n-11) and abandonment (n-5) were excluded from totals for % success measurements.



**Department of the Interior  
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North Central Region**