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# Waterfowl Production in a Selected Wetland Management Area

ORLO A. QUAME,\* ALFRED H. GREWE, JR.\*\*

**ABSTRACT** — This study of a Type 5 Federal Wetland Management Area showed that: (1) production (young remaining on the area to flight stage) in birds per acre was 0.74 in 1967 and 0.57 in 1968; (2) the greatest temporary use of the area was made by blue-winged teal, 64 being sighted at one time; and (3) artificial loafing structures may increase use of a wetland by breeding ducks.

According to the United States Department of the Interior's Bureau of Sport Fisheries and Wildlife (1964), wetlands in the United States were reduced by 45 per cent in the 100 years before 1955.

Instead of being waste areas, wetlands are productive in various ways, such as: (1) producing wildlife, particularly fish, waterfowl, and furbearers that contribute to the nation's economy and recreation; (2) storing ground-water essential to the nation's agricultural, domestic and industrial needs; (3) stabilizing surface waters to alleviate danger of drouths and floods (Martin, 1953).

In 1961, Congress made funds available to the bureau for the acquisition and leasing of wetlands. The federal plan included the following provisions of the important waterfowl producing prairie wetland acreage in Minnesota: (1) 10 per cent would be preserved by federal ownership; (2) 25 per cent by state ownership; and (3) 40 per cent by a permanent easement agreement with private owners. The preservation of the remaining wetlands was made the responsibility of the citizenry. This program has operated in 19 Minnesota counties.

The bureau has classified the wetlands of the United States into 20 types. Three of these types common to Pope County, Minnesota, are described as follows: "Type 3 — Shallow Fresh Marshes" soil normally waterlogged during the growing season, often covered with as much as 6" of water; "Type 4 — Deep Fresh Marshes" soil covered with 6" to 36" of water during the growing season; "Type 5 — Open Fresh Water" water of variable depth; located principally in glaciated country in the northern states, and in the Nebraska sandhills and Florida.

The purpose of this study of a Type 5 Federal Wetland Management Area was: (1) to show that waterfowl production and use existed within the purchased area; (2) to determine the amount by waterfowl production on the area and the extent of use of the area by waterfowl; and (3) to show that the Federal Wetland purchase objective for the area was attained. The study ran from June, 1967 through September, 1968.

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## Selection and description

The study site was chosen with the assistance of the personnel from the Benson, Minnesota office of the Fisheries and Wildlife Bureau after observation of many federal waterfowl production areas in Pope and Swift counties. Limiting the study area was to facilitate accessibility, and the site ultimately selected was the Melvin M. Berg Tract, Blue Mounds Township, Pope County, Minnesota.

The study area, purchased in 1965, is a 36 acre tract consisting of 17.6 acres of wetland and 3.5 acres of open water. It was fenced and signs were erected to indicate its purpose. The major water on the site is run-off from a rather substantial area of slopes facing north and south. Available data indicate that the water has remained at a rather constant level since the mid 1930's.

Records for the month of August, 1967, indicated a water loss of 7.5 inches. A year later the water loss for August was 4.25 inches. A total loss in water depth of 16 inches was recorded for 1968 from that of 1967.

Precipitation in Pope County is moderate, averaging 24.92 inches yearly at Glenwood, Minnesota (Moyle, 1964).

## Major species of vegetation

Identification and location of major plant species were important aspects to consider in determining the value of the site for waterfowl production and use. Figure 1 shows the area in August, 1967, from an elevation of 800'.

The submerged vegetation found in greatest abundance was star duckweed. (Appendix I gives scientific names of plant species mentioned.) In 1968 a heavy growth of floating algae was present where no growth had been present during 1967. Removal of the algae revealed a growth of arrowhead which was absent in 1967. A very abundant species in 1967, but scarce in 1968, was common bladderwort. It was replaced in 1968 by a heavy concentration of white water buttercup. Sago pondweed and muskgrass also were common. The major species of submerged vegetation were coontail, common bladderwort, naiad, snailseed pondweed, and red-head grass.

The successional order of emergent vegetation from open water to shore was softstem bulrush, arrowhead, bur-reed, cattail, reed grass, sedges and alkali bulrush. The sedges provided the nesting cover for all of the mallard nests located.



FIGURE 1. Aerial photograph taken August 14, 1967, locating north, south, and west vegetational zones. Photograph taken looking west.

Figure 2, a scale drawing, shows the upland vegetational zones 2 and 3. The vegetation of zone 2, the transition zone, included goldenrod, milkweed, sow thistle, Canadian thistle and quack grass. The most common species of zone 3 were alfalfa and sweet clover, with small clusters of big and little bluestem.

Observations in 1967 on waterfowl location showed all broods having a strong preference for the narrow north-west corner of the study site. In 1968, a mallard brood of eleven used the narrows. By the end of July, however, all broods were confined to shore-line areas of the main pond, due to the constant loss of water during the month.

#### Waterfowl production

In 1967 there were two pairs of blue-winged teal and one pair of mallards using the site. The teal pairs were observed after an alfalfa crop adjacent to the study area was mowed. Two teal nests were destroyed by the mowing. In 1968 no nests were located after the 1968 mowing of the same field. There were four pair of blue-winged teal and two pair of mallards on the area.

The data for waterfowl nesting on and bordering the study site are presented in Table I. Figure 3 shows the

nest locations, with mallard nests being in wetland areas providing a heavy sedge cover and teal nests in cultivated areas.

The two broods of blue-winged teal observed during 1967 numbered seven and six young respectively, at flight stage. Production on the area for 1967 was thirteen individuals or 0.74 birds per acre. In 1968 two broods of mallards of eleven and eight young and two broods of blue-winged teal with nine and eight young were present during July. However, only the blue-winged teal broods remained on the study site until flight stage (Table III). Production for 1968 was ten individuals or 0.57 birds per acre.

#### Use of area by non-nesting waterfowl

The species and numbers of waterfowl using the study site are presented in Table III. This table shows the highest single representative sightings for all flight stage waterfowl from June 1967 through September 1968. Greatest use of the area was made by blue-winged teal, the highest single count in 1967 being 23 and 64 in 1968. Other species observed were coots, green-winged teal, hooded mergansers, mallards, redheads, and wood

TABLE I. Locations and outcome of known nests on wetland and adjacent areas.

Location	Year	Species	Cover Type	Distance from water	Clutch size	Nest outcome
Wetland	1967	—	—	—	—	—
Adjacent Area	1967	Blue-wing teal	Alfalfa	510 ft.	—	Destroyed by mower
Adjacent Area	1967	Blue-wing teal	Alfalfa	375 ft.	—	Destroyed by mower
Wetland	1968	Blue-wing teal	Sweet clover	196 ft.	—	Destroyed by badger
Wetland	1968	Mallard	Sedge	500 ft.	11	Hatched 11
Wetland	1968	Mallard	Sedge	45 ft.	9	Hatched 8
Adjacent Area	1968	—	—	—	—	—

ZONES OF MAJOR EMERGENT AND UPLAND VEGETATION (JULY 1967)

POPE COUNTY WATERFOWL PRODUCTION AREA

BERG TRACT 34.53 ACRES

T. 124 N. R. 39 W. SEC. 35

HAY LAND (ALFALFA)

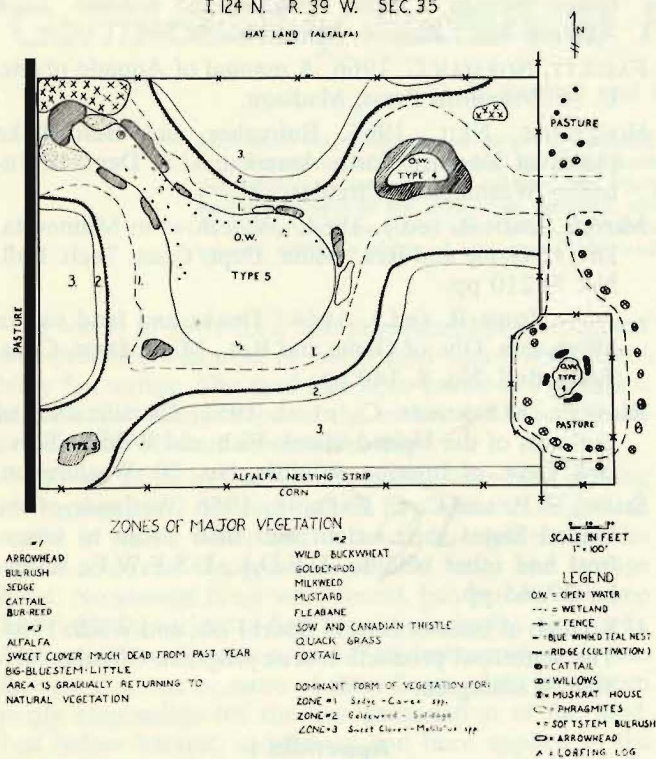


FIGURE 2. Location and identification of major emergent and upland vegetational zones of study site.

ducks. An immature hooded merganser sighted on the site in 1968 was one of three present until June 18, when two departed. The remaining duck was observed several times during the summer, and a major portion of its right wing was missing. Its fate is unknown.

**Use of natural loafing areas**

During 1967, two natural loafing areas were receiving use. These areas consisted of a muskrat house located in the northwest corner narrows, and a large rock protruding above the water surface in the northeast corner. Both mallards and blue-winged teal used these areas. During September and October, 1967, heavy muskrat activity was recorded on the study site. At least eight individuals were observed. No muskrats used the area in 1968.

**Use of artificial loafing structures**

In an attempt to increase use of the area, three artificial loafing stations were constructed in the open water. These consisted of: (1) a steel fence post driven into the pond

TABLE II. Broods observed on Berg Tract.

Species	Broods		Average brood size	
	1967	1968	1967 July-August	1968 July-August
Blue-wing teal . . . . .	2	2	7.5	6.5
Mallard . . . . .	—	2	—	—
			8.5	5.0
			9.5	—

TABLE III. Observed waterfowl use of study site, 1967-1968.

Species	1967 Frequency	Highest single sighting	1968 Frequency	Highest single sighting
Blue-winged teal . . . . .	Common	23	Common	64
Green-winged teal . . . . .	None	0	Rare	19
Hooded merganser . . . . .	None	0	Rare	3
Mallard . . . . .	Occasional	2	Occasional	11
Redhead . . . . .	Rare	1	None	0
Wood duck . . . . .	None	0	Rare	1
Coot . . . . .	Rare	1	Rare	3

TABLE IV. Observed waterfowl use of loafing-log stations for June through August, 1968.

Number of monthly observations <sup>1</sup>	LOAFING-LOG STATIONS			Total use for #1 #2 #3
	#1 Times used and per cent	#2 Times used and per cent	#3 Times used and per cent	
June <sup>2</sup> (12) <sup>3</sup>	8 66.7%	4 33.3%	5 41.7%	(36)—17 47.2%
July (12)	(9)—6 <sup>4</sup> 66.7%	6 50.0%	2 16.7%	(33)—14 42.4%
August (12)	0 .....	3 25.0%	4 33.3%	(24)—7 29.2%
Total monthly observations (36)	(21)—14 66.7%	13 36.1%	11 30.6%	Total use (93)—38 40.9%

<sup>1</sup> Observations spaced throughout the month with no more than 1 observation per day, with most observations based on a 2 day interval.

<sup>2</sup> Adequate water supply for all 3 stations.

<sup>3</sup> Parentheses indicate number of observations.

<sup>4</sup> Per cent based on 9 observations as of July 24 due to an inadequate water supply.

bottom with 18 inches remaining above the water surface; (2) two pressure-penta treated sections of wood fence post four and two and a half feet long stapled to a two and a half foot loop of #9 wire. The wire, attached to the steel post, allowed for free flotation of the logs. The use of each station was recorded. Station #2 was being used by a brood of teal the day after installation (August 17), the other stations were in use shortly thereafter. The logs were installed in August so that they might age over winter and so that they would be in place when spring migrants arrived.

The first spring use of the structures was on April 10, when a pair of mallards were present. On April 28 all stations were being used by pairs of blue-winged teal and one also was being used by a pair of mallards. No hostility was noted between the mallards and the teal, but great defense was made by loafing males when others of the same species neared their stations.

Table IV shows the percent of times that use of the logs was observed during 1968. Frequent observations were made on all of the stations except #1 which had dried up by July 24. The stations were in use 47.2 percent of the time in June and only 29.2 percent in August. Highest use of a single station was 66.7 percent for station #1, in spite of its drying up. Total use of all stations for the summer was 40.9 percent.

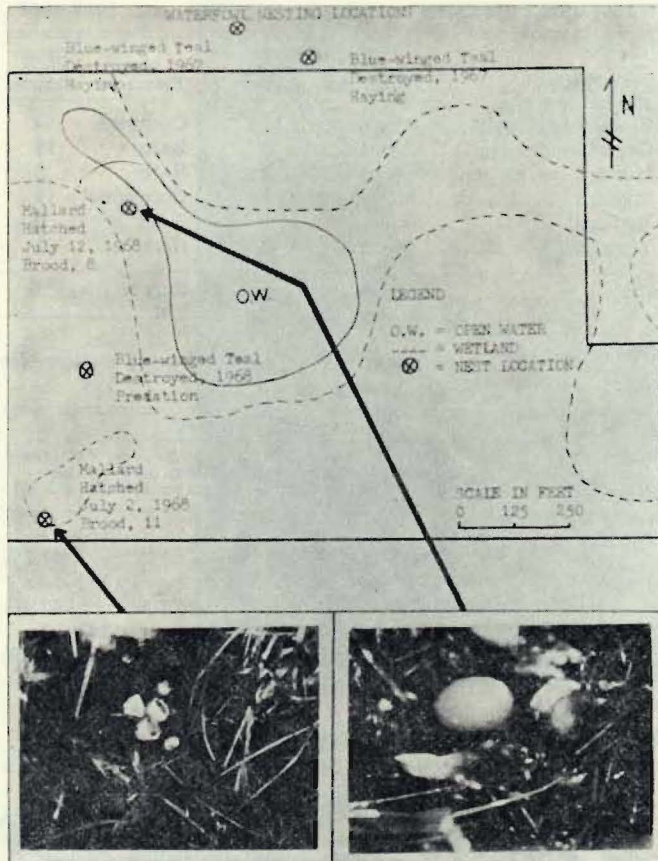


FIGURE 3. Waterfowl nesting locations on study site, 1967-1968.

### Migration and reproduction factors

No cost figures are available for this area in dollars per duck, but the study has shown that use is made of this federal wetland by migratory waterfowl both for rest during migration and for reproduction.

Many migrant ducks are attracted to the area but most do not nest. Nests in adjacent cultivated areas are often destroyed. Mallards appear to prefer natural vegetation, while teal apparently prefer short grass or agricultural land if available.

Artificial loafing sites were heavily used. In the absence of, or in addition to, natural sites these structures may allow for greater use of a given water area by breeding birds.

Increased management of such a tract by water level control, by establishment of more loafing sites, and (since some species seem to prefer cultivated areas) by actual cultivating or controlling growth on the upland areas might bring about an increase in total duck production.

The purposes, as stated, for the establishment of federal wetlands have been, in part, fulfilled by this wetland.

### Acknowledgments

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### Appendix I

Plant Species Mentioned in paper:

SCIENTIFIC NAME	COMMON NAME
<i>Oedogonium sp.</i>	Algae
<i>Chara vulgaris</i>	Muskgrass
<i>Typha latifolia</i>	Wide-leaved cattail
<i>Typha angustifolia</i>	Narrow-leaved cattail
<i>Sparganium eurycarpum</i>	Bur-reed
<i>Potamogeton perfoliatus</i>	Red-haired grass
<i>Potamogeton diversifolius</i>	Snailseed pondweed
<i>Potamogeton pectinatus</i>	Sago pondweed
<i>Najas flexilis</i>	Naiad
<i>Sagittaria latifolia</i>	Arrowhead
<i>Phragmites communis</i>	Reed grass
<i>Agropyron repens</i>	Quack grass
<i>Andropogon scoparius</i>	Little bluestem
<i>Andropogon gerardi</i>	Big bluestem
<i>Scirpus validus</i>	Softstem bulrush
<i>Scirpus fluviatilis</i>	Alkali bulrush
<i>Carex spp.</i>	Sedges
<i>Lemna trisulca</i>	Star duckweed
<i>Ceratophyllum demersum</i>	Coontail
<i>Ranunculus circinatus</i>	White water buttercup
<i>Melilotus spp.</i>	Sweet clover
<i>Medicago sativa</i>	Alfalfa
<i>Asclepias spp.</i>	Milkweed
<i>Utricularia vulgaris</i>	Common bladderwort
<i>Solidago spp.</i>	Goldenrod
<i>Cirsium arvense</i>	Canadian thistle
<i>Sonchus spp.</i>	Sow thistle