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PRODUCTION OF WATERFOWL IN THE RAIN BASIN AREA
OF SOUTH CENTRAL NEBRASKA

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One important form of wetlands habitat in Nebraska is the "Fresh-water Basins"; their importance extends to both waterfowl and upland game. The fresh-water basins are located primarily in south-central Nebraska. They are closed drainages, usually from one to 40 acres but ranging up to 1,000 acres, formed in the gently rolling loess plains. Soils are silt loam and the somewhat impervious soils in flat or depressed position receive and retain the largest amounts of water. This caused leaching and concentration of clay in the sub-soil forming a soil type peculiar to these areas known as "Scott silt-loam," a heavy clay-loam which forms a water-retaining soil from four inches to more than six feet thick in some cases. Run-off waters which collect in these basins are usually retained from a few days to several months. The primary loss is to evaporation (the evaporation rate for this general area is taken at 50 inches annually). Little water is lost to percolation.

The soil in these basins is fertile but not very tillable and the basins usually are used most profitably for grazing or haying of the sedges, grammas and wheatgrass. However, many are plowed and planted to row-crops during dry years. In wetter years the basins have excellent stands of both annual and perennial smartweeds in and adjacent to the basins.

To show distribution of croplands and land use, data were used from a nine-section area in Clay County, the second tier of counties north of the Nebraska-Kansas line. This area was used for pheasant research and a history of land use was available. In 1956 all the basins were dry on the study area. Rains in the late spring of 1957 put water in most of the basins and the water level was maintained quite stable through 1958. In the spring of 1958 there were 576 acres of water in 27 basins, or approximately 10 percent of the land was under water. Land was under intensive agriculture. Areas not cultivated or grazed comprised less than three percent of the area and consisted of roadsides, farmsteads, fencerows and a few corners of unused lands.

About 30 percent of the land is used for production of milo; 20 percent for wheat; 15 percent for corn; and five percent for alfalfa. Approximately 10 percent is used for pasture.

Deep well irrigation is common and about 20 percent of the area is irrigated.

Data presented in this report were collected during assigned field activities of a pheasant nesting study under Pittman-Robertson Project W-28-R.

Waterfowl use these ponds quite extensively when water is available, especially during spring and fall migrations. To obtain an estimate of breeding populations, a count was made for nine sections on May 13, 1958. During the spring of 1958 the ponds had practically no vegetation and counts were relatively easy. Seven hundred and fifty-five ducks were counted. Species and numbers of each species observed are listed in Table I.

Table I. Ducks on Clay Center area on May 13, 1958.

Species	Pairs	Lone Males	No. in Groups	Total
Bluewings	70	14	114	282
Pintails	31	46	18	172
Shovellers	18	24	5	89
Mallards	8	6	6	34
Baldpates	3			6
Redheads			5	5
Scaups	1			2
Unidentified				165
TOTAL	131	90	148	755

These are minimum figures for the area, as these birds were actually counted and not estimated.

The number of birds observed in pairs and single males by species is shown in Table II.

Table II. Pairs and single males observed on area on May 13, 1958.

Species	Pairs	Single Males	Breeding Pairs*
Bluewings	70	14	84
Pintails	31	46	77
Shovellers	18	24	42
Mallards	8	6	14
Baldpates	3		3
Scaups	1		1
TOTAL	131	90	221

*Assuming one female for each lone male.

Assuming a hen for each lone male counted, a minimum breeding population of 221 pairs of ducks was on the nine sections. This was also a minimum figure, because of those not seen during the count and some of the birds classified as groups may have included breeding pairs.

On this nine-section pheasant research area, a pheasant productivity study was carried out. Information on duck nests found during this study was also recorded. The nest study was patterned after Stokes' study on Pelee Island, Ontario. Sample plots were selected at random in each cover type and these plots were searched thoroughly for nests. The rate of sample for each cover type is shown in Table III.

Table III. Rate of sampling by cover types.

Cover Type	Sampling Rate
Alfalfa	1/6
Roadside	1/6
Wheat	Not sampled
Meadow	1/6
Unused	1/6
Fencerow	1/6
Stubble	1/10

During the study 81 duck nests were found. Average clutch size of incubated eggs was nine. Fifty-three nests were on plots and the remainder were found through supplemental searching. Number of nests found in each cover type and number of nests of each species found are presented in Table IV. Alfalfa and roadside were the most commonly used cover types. Only nine acres of green wheat were searched and one blue-winged teal nest was found. Of the 81 nests found, 13, or 16 percent, were successful.

The cover type in which nests were located on plots is shown in Table V. Eight, or 15.1 percent, of these nests were successful.

Estimates of production were made by projection of the sample. Table VI shows the number of nests on plots, estimated number of nests on the area, number of successful nests and estimated number of successful nests on the area. It was estimated that 48 nests were successful. These were produced in roadside, alfalfa, meadow and unused areas. If 48 broods were produced, 21.7 percent of the observed breeding pairs brought off broods.

Fate of nests found on the study area is shown in Table VII.

Predation by mammals accounted for 33.8 percent of the destroyed nests. The most common mammals on the study area were the striped skunk, little spotted skunk, raccoon, badger, opossum, thirteen-striped ground squirrel and Franklin's ground squirrel.

Mowing of alfalfa accounted for 19, or 28 percent, of the 68 destroyed nests. Three incubating hens were killed by the mower.

Many of the stubble fields were burned during the first part of May. This practice accounted for the destruction of many pintail nests. In one instance the hen returned to the nest and continued incubating the scorched eggs until the field was plowed about two weeks later. Eggs of one pintail nest were within one day of hatching on May 6 when the field was burned.

Although an attempt was made to count total number of broods and number of ducks on the area during the last two weeks of August, an influx of birds and dense vegetation on the basins made it impossible to obtain an estimate of production. However, 41 different broods were observed in the vicinity of the study area. The average number of young per brood is shown in Table VIII.

Table IV. Record of all duck nests found on the Clay Center area.

Species	Cover type														No. Succ.	No. Unsucc.	Total
	Roadside		Alfalfa		Meadow		Unused		Wheat		Stubble		Fencerow				
	S.	U.	S.	U.	S.	U.	S.	U.	S.	U.	S.	U.					
Bluewing	3	15	1	8	1	2	1	4	0	1	0	1	0	1	6	32	38
Pintail	0	3	1	10	1	0	0	2	0	0	0	9	0	0	2	24	26
Shoveller	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2	2
Mallard	3	1	1	3	0	2	0	0	0	0	0	0	0	0	4	6	10
Unknown	1	0	0	1	0	0	0	1	0	0	0	2	0	0	1	4	5
All species	7	20	3	22	2	4	1	8	0	1	0	12	0	1	13	68	81

Table V. Record of duck nests found on plots.

Species	Cover type												No. Succ.	No. Unsucc.
	Roadside		Alfalfa		Meadow		Unused		Stubble					
	S.	U.	S.	U.	S.	U.	S.	U.	S.	U.				
Bluewing	2	8	0	7	1	2	1	4	0	0	4	21		
Pintail	0	2	1	4	1	0	0	2	0	9	2	17		
Shoveller	0	1	0	0	0	0	0	1	0	0	0	2		
Mallard	1	0	1	1	0	2	0	0	0	0	2	3		
Unknown	0	0	0	1	0	0	0	1	0	0	0	2		
Total	3	11	2	13	2	4	1	8	0	9	8	45		

S. -- Successful
U. -- Unsuccessful

Table VI. Estimated number of nests and nest success.

Cover Type	No. Nests on Plots	Sample Ratio	Est. No. of Nests	No. Successful on Plots	Est. No. Successful Nests
Roadside	14	1/6	84	3	18
Alfalfa	15	1/6	90	2	12
Meadow	6	1/6	36	2	12
Unused	9	1/6	54	1	6
Fencerow	0	1/6			
Stubble	9	1/10	90		
Total	54		354	8	48

Table VII. Fate of unsuccessful nests.

Species	Mammal	Alfalfa Mowing	Burned	Abandoned	Unknown	Farm Machinery	Total
Bluewing	18	8	0	3	3	1	33
Pintail	2	9	9	2	2	1	25
Mallard	2	1	0	2	2	0	7
Shoveller		0	0	0	0	1	1
Unknown	1	1	0	0	0	0	2
All species	23	19	9	7	7	3	68

Table VIII. Number of broods and young observed in the vicinity of the study area.

Species	No. of Broods	No. of Young	Average No. of Young Per Brood
Pintail	23	126	5.5
Shoveller	9	61	6.8
Bluewing	9	62	6.9
Mallard	0	0	0.0
All species	41	249	6.1

An average of 6.1 ducks was recorded for each brood. With this average and an estimated 48 broods produced on the area, the number of young reared was 293 ducks.

It is generally assumed that these areas cannot be drained. However, we are finding that they can and they are. A new Wetlands Survey inaugurated in 1959 has shown the magnitude with which this has progressed. These areas are not ditched, but either pumped dry for irrigation crops, leveled to be irrigated or concentrated into reservoirs or ditches.