

to their young numbers of the large crane fly (*Tipula trivittata*), which were everywhere common. The mating insects were easily caught, and frequently a bird would approach the nest with two, or even three, pairs of these mated flies.

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THE DUCK SITUATION IN THE PRINCE ALBERT DISTRICT,
CENTRAL SASKATCHEWAN

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There has been a great deal of controversy lately over the decrease in the numbers of ducks; so much so, that the writer decided to make a fairly detailed survey of a particularly favorable area in an attempt to draw conclusions as to the existing conditions in that area.

This report is based on a survey of ninety-nine potholes and sloughs on sixteen quarter-sections about five miles south of the city of Prince Albert.

The Prince Albert district is on the dividing line between the typical Canadian and Transition life zones. It is in the heart of the pothole country and as a breeding ground for ducks is looked upon as excellent. The area worked consisted of a creek, which backs up in the spring to keep the water level of some of the sloughs fairly constant throughout the summer, wooded areas with aspens as the main tree, field crops such as wheat, oats, and barley; and hay meadows. The surface of the land is rolling which accounts for the large number of sloughs and potholes.

It was necessary to work quickly in order that the water levels of all the area worked would be in the same ratio with one another, to avoid counting one brood more than once, and also to have the "cover" of one slough to compare with that of another. The work was started late in July in order that the water levels and food might be more readily discernible.

The potholes and sloughs examined varied in size from one-half acre to twelve acres, the average being 2.6 acres. The areas taken were those of the open water. Every pothole in the list has open water throughout the summer.

The Graph 1 (Fig. 12) shows the number and size of the bodies of water examined.

DATA FOR GRAPH 1

No.	Smallest	Largest	Average
99	½ acre	12 acres	2.6 acres

Many of the potholes contained fresh water, particularly those that were fed by the overflow from the creek in the spring. There was no evidence of excessive alkalinity in any of the water in the whole area.

In listing the surrounding "cover" about the sloughs and potholes only the main characteristic plants are mentioned. The provision for suitable nesting sites was the basis for the terms "good", "poor", and "fair".

Those classed as "good" had a good stand of *Scirpus* or *Typha* in the water and a secondary ring around the land edge of *Panicularia grandis*, *Scolochloa festucacea*, or various species of *Cyperaceae* such as *Scirpus americanus* or some of the *Carex* group. The inner ring being considered suitable for the diving ducks and the outer satisfactory for the surface feeding. Those classed as "fair" had either one of these rings but not both; and those classed as "poor" had neither of these rings or only traces.

No.	CLASSIFICATION ACCORDING TO COVER					
	Good		Fair		Poor	
	No.	Per cent	No.	Per cent	No.	Per cent
99	62	62.62	16	16.16	21	21.21

The main plants found to form the cover around these sloughs and potholes were: *Scirpus validus*, *Scirpus americanus*, various *Carex*, *Panicularia grandis*, *Scolochloa festucacea*, and other grasses. In one or two cases odd patches of *Phragmites phragmites* were noted. No attempt was made to estimate the particular percentage of any one plant with any other plant around a particular body of water. Instances of traces of other plants than those mentioned were discarded; only the characteristic plants were considered.

The grazing of livestock around the edge of some sloughs seriously affected the outer growth and destroyed the nesting sites for surface ducks. However, most of the potholes and sloughs in this area have a growth of aspens and willows around them, very often to within thirty or forty yards of the water, thus alleviating conditions to a certain extent. Mallards in particular frequently nest in willow growth around small potholes.

Most of the bodies of water classed as "fair" had the outer land edge of cover destroyed by stock.

The following table gives the number of bodies of water containing specific cover plants abundant enough to form a characteristic part of the cover around them.

Specific plant abundant enough to form one of the characteristic covers	No. of sloughs in which it was abundant	Percentage of sloughs in which it was abundant
<i>Typha latifolia</i>	62	62.62
<i>Scirpus validus</i>	52	52.52
<i>Scirpus americanus</i>	32	32.32
<i>Panicularia grandis</i>	41	41.41
<i>Hordeum jubatum</i>	2	2.02
<i>Scolochloa festucacea</i>	35	35.35
<i>Carex</i> ssp.....	Various species were very common	

Food plants were noted as being common. As with the "cover" plants, no attempt was made towards a detailed list at any slough; those mentioned were the more readily apparent and in most cases seemed abundant.

Sloughs with ample food		Sloughs with food noted as scarce	
No.	Per cent	No.	Per cent
87	87.87	12	12.12

The following table gives the number of bodies of water containing specific food plants abundant enough to form a characteristic part of the food in them.

Specific plant abundant enough to form one of the characteristic foods	No. of sloughs in which it was abundant	Percentage of sloughs in which it was abundant
<i>Potamogeton</i> ssp.	61	61.61
<i>pectinatus</i>		
<i>perfoliatus</i>		
<i>Cyperaceae</i>	56	56.56
<i>S. americanus</i>		
<i>S. validus</i>		
<i>Carex</i> ssp.		
<i>Scolochloa festucacea</i>	35	35.35
<i>Ranunculus aquatilis</i>	7	7.07
<i>Lemna minor</i>	5	5.05
<i>Naias flexilis</i>	5	5.05

Other foods present but not in abundance:

- Ruppia maritima*.
- Sagittaria latifolia*.
- Polygonum amphibium*.
- Eleocharus palustris*.

In twelve of the deeper sloughs no food was readily apparent, this may have been because the food was beneath the surface and not so readily discernible.

Many of the bodies of water containing an abundance of food did not shelter a single brood. The following table is based on the eighty-seven sloughs and potholes that did contain ample food which was readily apparent.

Food and Duck Broods		Food and No Duck Broods	
No.	Per cent	No.	Per cent
40	45.96	47	54.04

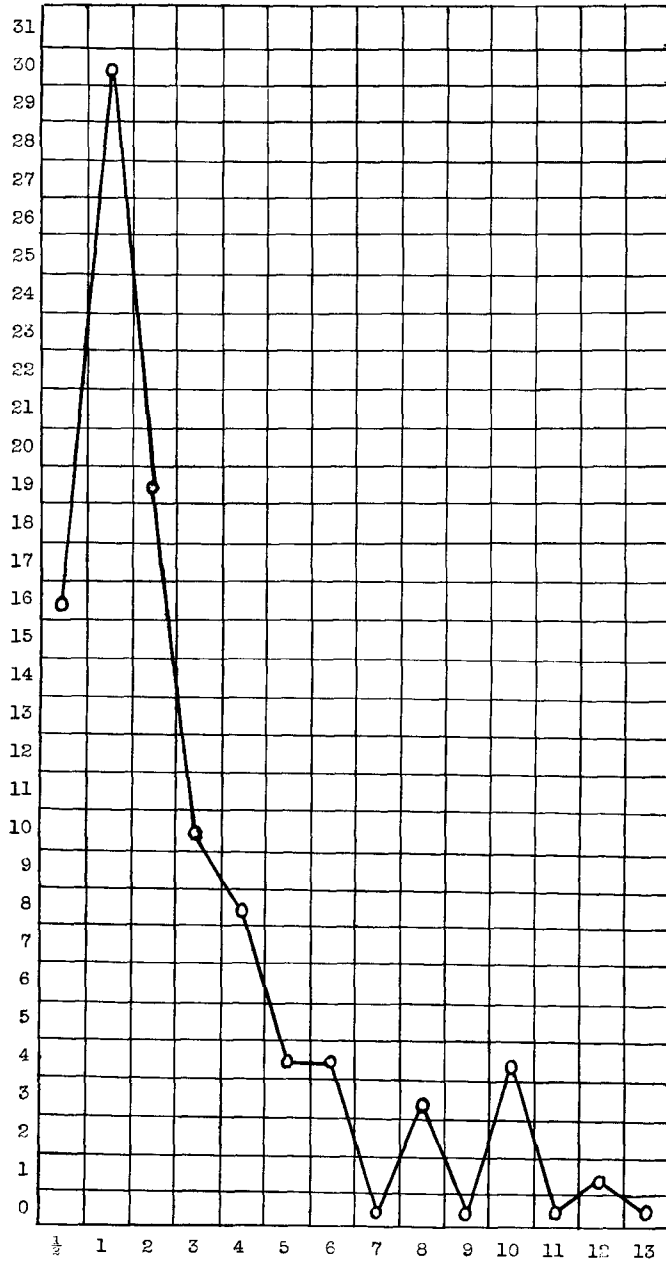


FIG. 12. Graph No. 1, showing number and size of the bodies of water examined. Vertical scale indicates number of sloughs; the horizontal scale, the size in acres.

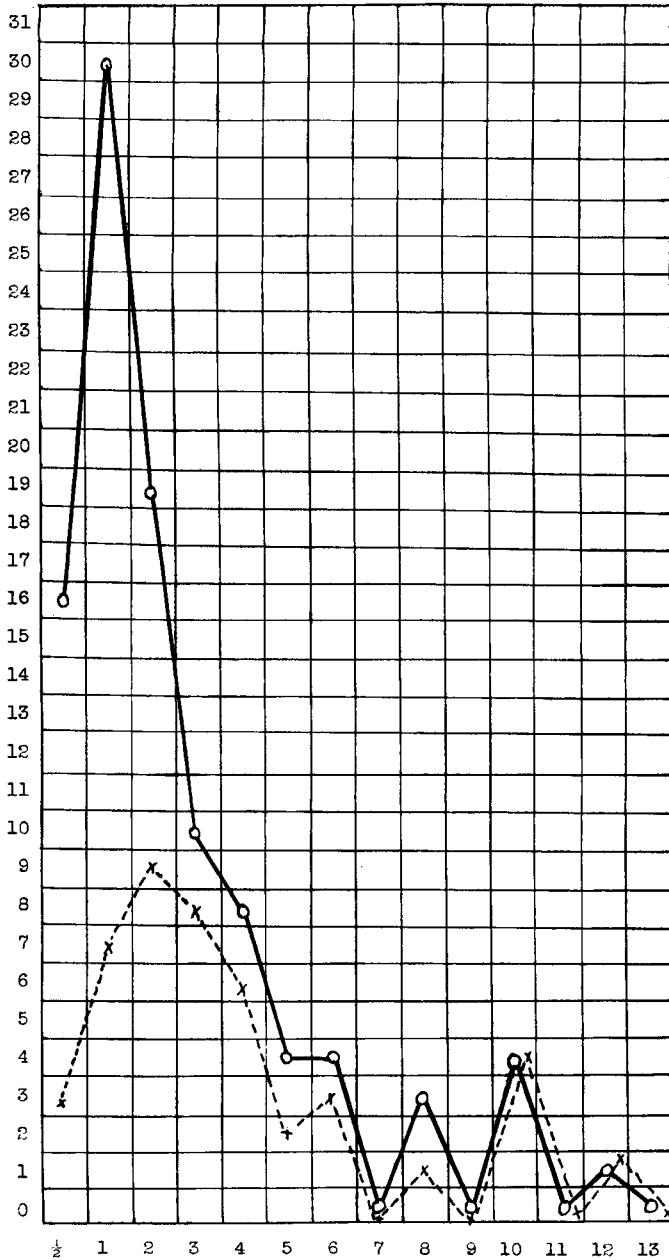


FIG. 13. Graph No. 2, showing relationship between size and number of sloughs, or potholes, and the actual number containing broods. The continuous line shows the number and size of sloughs; the broken line indicates the actual number that contained broods.

The water in the area showed a tendency to lower levels than last year. The supply may be considered as coming from two sources:

1. Those potholes and sloughs that depend mainly on the surrounding surface run-off during the spring thaw, and
2. Those sloughs and potholes that keep their level mainly by the overflowing of the creek banks at low points during the spring flood.

The following table shows the relative water levels as compared with the season of 1933.

Total Sloughs	Total Same		Total Lower		Total Higher	
	No.	Per cent	No.	Per cent	No.	Per cent
99	47	47.47	50	50.50	2	2.02

Those bodies of water flooded by the creek in the spring stand up to summer evaporation much better than those that receive their water from the surface run-off as is shown by the following table:

Total Creek Sloughs	Creek Sloughs Same		Creek Sloughs Lower		Total Surface Sloughs	Surface Run-off Same		Surface Run-off Lower		Surface Run-off Higher	
	No.	Per cent	No.	Per cent		No.	Per cent	No.	Per cent	No.	Per cent
21	14	66.66	7	33.33	78	34	43.59	42	53.85	2	2.56

The spring surface run-off varies according to the spring. If the weather is mild during February and March, the snow packs and does not melt so quickly, with the result that most of the moisture goes into the ground.

To fill the surface sloughs a hard, cold winter with ample snowfall and a short, quick spring practically assures a good surface run-off. The spring of this year, 1934, was very slow, consequently the sloughs were very low, more so than they have ever been before. Seven inches of rain in June, which came in heavy storms and ran off, alleviated conditions somewhat and helped to bring some back to last year's level, two being slightly higher.

A total of 101 broods was counted, with an average of 1.02 per pothole. Actually, however, only 44 sloughs and potholes contained families. Diving ducks were much more numerous than the surface feeding species and comprised 65 of the 101 families observed; possibly this was because conditions were more favorable for them.

Sloughs suitable for diving ducks		Sloughs suitable for surface ducks		Sloughs suitable for both types	
No.	Per cent	No.	Per cent	No.	Per cent
57	57.57	42	42.42	16	16.16

There appeared to be a great deal of overlapping and several times it was noted that a slough or pothole classed as being a surface-feeding slough had a family of diving ducks on it. Those classed as being suitable for diving ducks had either no land cover but a good stand of *S. validus* or *T. latifolia*; or the water was considered too deep for the surface feeders. Those classed as being suited for the surface feeders had a good land cover and the food was on or near the surface. Those classed as being suited to both types had a combination of the aforementioned characteristics.

The female ducks with broods almost invariably swam out into the open water with their young behind them; only when surprised on the smaller potholes did they try to hide among the cover.

The following tables show the specific broods.

SURFACE DUCKS

Species	Broods	Average brood	Smallest brood	Largest brood	Percentage of surface feeders
Mallard	5	6.40	5	8	12.95
Widgeon	5	7.00	6	8	14.89
Green-winged Teal	1	5.00	5	5	2.02
Blue-winged Teal	14	7.35	3	10	41.70
Shoveller	3	6.33	5	8	7.73
Pintail	8	6.63	3	9	21.45

DIVING DUCKS

Species	Broods	Average brood	Smallest brood	Largest brood	Percentage of diving ducks
Redhead	3	5.00	4	6	4.54
Canvasback	18	5.50	3	8	27.28
Lesser Scaup	19	7.05	2	9	28.78
American Goldeneye....	2	4.50	4	5	3.03
Bufflehead	2	4.50	3	6	3.03
Ruddy	21	5.28	2	9	31.81

Percentages for Both Groups

Species	Total young	Percentage of total young
Mallard	32	5.12
Widgeon	35	5.60
Green-winged Teal	5	.08
Blue-winged Teal	103	16.50
Shoveller	19	3.02
Pintail	53	8.49
Redhead	15	2.40
Canvasback	99	15.88
Lesser Scaup	134	21.47
American Goldeneye	9	1.44
Bufflehead	9	1.44
Ruddy	111	17.78
Average young per brood.....	6.18	

The Graph 2 (Fig. 13) shows the relationship between the size of the sloughs and potholes, and the actual number containing broods.

None of the sloughs or potholes appeared to be overcrowded; in one slough, covering about six acres, nine families were noted. This was the only instance where more than five families were noted on the same body of water.

Graph 3 (Fig. 14) shows the number of sloughs and the actual number of broods on each.

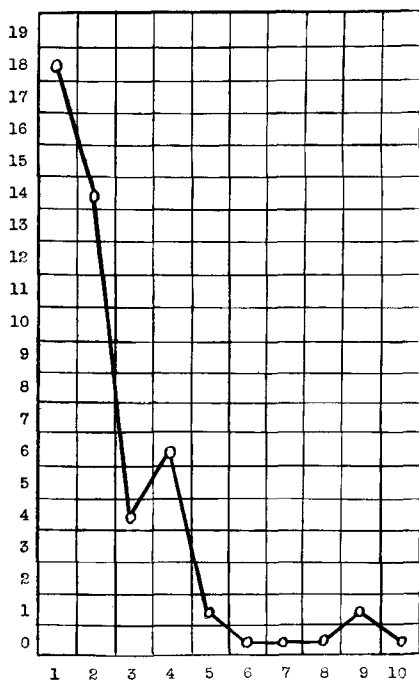


FIG. 14. Graph No. 3, showing actual number of broods. The vertical scale indicates the number of sloughs sheltering the number of broods indicated in the horizontal scale.

It will be noted that Mallards were not common. This is probably due to the time of the year that the count was made. Mallards are the earliest nesting duck in the district and it is quite common to see them with their young by May 24. This means that the earlier hatched birds are two months old by the time that this survey was made; and, if out in the water, are very difficult to separate from the adult females, particularly so if the adults are in the eclipse stage.

An estimate was made as to the probable breeding conditions for the season 1935 and it was found that after due allowance was made for surface evaporation during August and with an average winter, that conditions on the whole would be fair to normal. The normal not of ten years ago but of the last five. Out of the total of ninety-nine sloughs and potholes the situation should be about as follows:

Good		Fair		Poor	
No.	Per cent	No.	Per cent	No.	Per cent
52	52.52	21	21.21	26	26.26

The classification "good" includes food, water, and cover all being favorable. "Fair" includes cover and water both being favorable, and "poor" minus two of the three necessary qualities.

In conclusion, after surveying the whole situation in what is termed a very favorable area, particularly during the last five years when compared with the prairie regions, it appears that conditions were more favorable in this area for ducks to raise families than the actual number that did. It would be impossible to ascertain the exact number of broods raised; but when a large number of sloughs and potholes contained ample food, suitable cover, had a good water level, and no evidence of overcrowding noted (see Graph 3), but contained no duck broods (see Graph 2), it forces us to the conclusion that either *there were not the ducks here to breed* or that some unknown factors were working. The former reason sounds the more logical.

In making a survey of this kind it was found that two counts per season should be made. The first about the end of June when only Mallards and Pintails should be noted; and a second about the end of July to determine the other species of ducks, food, cover, and water levels. As has been stated before, Mallard broods may be noted as early as May 24, yet on July 25 of this season a Blue-winged Teal was flushed from a nest containing seven eggs.

PRINCE ALBERT, SASKATCHEWAN.