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CROP DEPREDATION BY WATERFOWL IN PRAIRIE CANADA

Phase I

Identification of Farm Regions Suffering Severe and Recurrent Damage in Recent Years

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NOTE

This draft was prepared for the Migratory Birds Committee of the Canadian Wildlife Service, Western Region. The data presented are intended for information and for administrative purposes only. A limited number of copies are available upon request to R. H. Mackay, Canadian Wildlife Service, Edmonton.

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Phase I. Identification of Farm Regions Suffering Severe and Recurrent Damage in Recent Years

Introduction

With the demise of the stationary threshing machine and the advent of the swathing-combining method of harvesting grain, damage to cereal crops by migratory birds on the prairies assumed new proportions. The problem of waterfowl depredation in the United States warranted discussion as a separate topic as early as the 9th North American Wildlife Conference (Day, 1944) and was a problem of growing concern in Canada by the late 1940's (Gollop, 1950; Colls, 1951). Since that time, a voluminous amount of both published and unpublished literature has been devoted to problems arising from the geographical overlap of the "grain belt" and the "duck factory". Some areas on the Canadian prairies which are traditionally susceptible to waterfowl damage have long been recognized and have been delineated and studied to varying degrees. It is also recognized that the prairie farmer is more tolerant in years of good markets and good harvest conditions, and suffers most when adverse weather conditions delay the combining of swathed grain.

The Migratory Birds Convention Act authorizes the issuance of pre-hunting season shooting permits to scare and/or kill depredating birds, but this time-honored and traditional control measure has obviously fallen far short of curing the problem. Numerous other scaring techniques, devices, and methods, lure crop areas and feeding

stations, and farmer reimbursement programs have been developed and used in various combinations with differing degrees of success in local situations. In spite of modern methods and present programs, crop losses in Alberta alone during 1968 have been estimated to have been at least three million dollars and were probably higher in 1969. The relative effectiveness, advantages, and shortcomings of current programs in different regions are topics of another report to follow at a later date.

This report is the first phase of a four-stage program designed to aid in the development of a Federal policy statement to show the relationships among waterfowl habitat, public recreation, and crop depredation programs. Its purpose is to delineate priority areas in each of the provinces of Alberta, Saskatchewan, and Manitoba according to the frequency and intensity of damage occurring on farmland and to identify the numbers of migratory waterfowl causing the damage during the periods 1964-69 in Alberta and 1965-69 in Saskatchewan and Manitoba. It is hoped the results will provide some insight into what specific areas need further investigation if a sound program (or programs) designed to reduce prairie farmers' economic losses and their growing animosity toward the waterfowl resource is to be developed. As so aptly stated nearly 20 years ago "A solution to the duck damage problem is an urgent need, and must be met, if the whole-hearted cooperation of the farming public is to be enlisted in any wholesale program for the restoration of waterfowl habitat" (Leitch, 1951).

Present Provincial Programs

Programs for the control, alleviation, and compensation of damage done to commerical crops by migratory waterfowl have evolved separately in each of the prairie provinces.

In Alberta, permits to kill migratory birds causing crop damage prior to the opening of the hunting season are available to affected landowners through the Canadian Wildlife Service or local offices of the Fish and Wildlife Division or R.C.M. Police. A provincial "all-risk" comprehensive insurance program includes losses from depredating waterfowl and is available throughout the province. A lesser known scheme is a provincial compensation program financed solely by game hunters via a $3 Wildlife Certificate. In both cases, losses are evaluated by adjusters of the Alberta Crop Insurance Corporation. Damage is assessed, by type of crop, number of acres affected and percentage of loss, at a cost to the farmer of $25 per inspection. Awards pay up to a maximum of $15 per acre or one-half the crop value, allocated on a fixed bushel value. Compensation is received on which ever is the lesser value, generally the $15/acre figure. The compensation program has not been widely advertised and it has not been general policy to advise farmers applying for shooting permits of its existence. No lure crop areas were in operation in Alberta during the period 1964 to 1969. In 1970, the provincial government bought private crops to establish four lure areas and established one feeding station. One lure crop was located northeast of Beaverhill Lake, with an additional 3 lure crops and the feeding station situated northwest of Grande Prairie.

Kill permits are available to the affected landowners in Saskatchewan through the CWS or local offices of the Wildlife Branch or R.C.M. Police. A depredation insurance program, partially funded by a $1 surcharge on hunting licenses, is administered by the provincial Government Insurance Office. Annual premiums on depredation insurance are 2% of the desired coverage, up to a maximum of $25 per acre. Damage is assessed, by type of crop, number of acres affected and percentage of loss, at no cost to the farmer. Depredation insurance is administered in conjunction with the hail insurance program and is very well known throughout the province. Provincial lure crop areas were operated during 1970 on Crown land near Tobin Lake, Eyebrow Lake, Waterhen Marsh, and Lake Diefenbaker and on private land near Eyebrow Lake.

In Manitoba, permits to scare migratory birds causing crop damage prior to the opening of the hunting season are available through the CWS or local offices of the Wildlife Branch or R.C.M. Police. Upon request, provincial wildlife officers will demonstrate to farmers the construction and/or use of various scaring devices. In cases of very severe and persistent damage, the Wildlife Branch will furnish cracker shells or loan acetylene exploders. As an incentive for farmers to purchase and operate their own scaring devices, wildlife officers will service and repair privately-owned exploders. Permits to kill depredating waterfowl are available but are used only as a last resort. No compensation or insurance program was in effect in Manitoba during 1965-69, and therefore no means of measuring intensity of damage is

available. During 1970, provincially operated lure crops were located on private land near The Pas, Big Grass Marsh, Grant's Lake and Delta Marsh.

Sources of Data

In addition to numerous published reports and technical papers, a great deal of unpublished information on the nature, extent, and amount of waterfowl damage presently exists in various files of the CWS and the three provincial wildlife agencies. Fortunately, much of the available data has recently been compiled, tabulated, and plotted on maps by a private consulting firm. Under contract to the Alberta Department of Lands and Forests, Renewable Resources Consulting Services, Ltd. (RRCS) compiled an exhaustive 166-page report on the Alberta depredation situation for the period 1964-68 (RRCS, 1969). Under contract to the CWS, this same firm completed a similar, but less extensive, preliminary report on the Saskatchewan problem for 1965-69 (RRCS, 1970). Both reports contain detailed historical data on compensation payments received by farmers suffering crop damage, by land location, and have been freely drawn upon as bases for this report. Manitoba has had no compensation or insurance program but the Wildlife Branch furnished historical data on registered complaints where action was taken by conservation officers during 1965-69. Personal interviews and correspondence with knowledgeable persons intimately connected with the depredation problem in each province were also used to supplement the three basic sources of data described above. In addition, the Alberta document prepared by RRCS was updated

using copies of the 1969 damage payment vouchers furnished by the Alberta Fish and Wildlife Division. Each province furnished information on the location and size of lure crop areas operated in recent years.

Using the historical information contained in the RRCS reports for Alberta and Saskatchewan, and the information furnished by the Manitoba Wildlife Branch, all land sections suffering past depredation were plotted on a 1" = 12 mile maps of each province. These maps, pointing out definite "clumpings" of damage in each province, are shown in reduced form in Figures 1-3. Tables 1-3 were compiled using data contained in the three reports. These tables have been limited to those land sections on which damage was frequent and intensive, and for Alberta and Saskatchewan, show cumulative total payments made in compensation. In the compilation of the RRCS reports, it was not possible to differentiate between damage done by waterfowl and that done by other game species, nor could any provision be made for damage actually sustained in one year but claimed in the following. Any effects of these two possible sources of error are considered to be minimal if not insignificant.

Interviews with individuals familiar with the amount of recorded information on the numbers of waterfowl causing depredation across the prairies between 1964-69 confirmed suspicions that very little in the way of quantitative data is available. A limited amount of information is available on approximate numbers of birds using some of the better known staging or migration lakes at various times of the year during certain years. Existing numerical records are better for some areas

than others but on a wide scale are incomplete at best and could not be used to serve as reliable indicators of the numbers of birds consistently effecting damage or the intensity of damage.

Canada Land Inventory waterfowl capability maps were used, where available, to aid in locating water areas which might be used as staging areas by waterfowl.

Shortcomingsin considering only the period 1964-69 and in using only the sources of data described above are recognized. The data used do cover comparable periods of time and conditions in each province, represent years of both "high" and "low" damage frequency and intensity, cover years of relatively "high" and "low" waterfowl population levels on the prairies, and should be current and extensive enough to minimize any effects of changing land use in recent years. The information used is considered to be the most comprehensive and the best that is readily available.

Discussion

Figures 1-3 depict the location and extent of damage complaints across the prairies in recent years and illustrate the clumping or clustering of reports from traditional feeding areas. Table 1-3 have been compiled to show the recurrent nature of damage on certain land parcels in all three provinces and the magnitude of cumulative payments made on individual sections of land in recent years in Alberta and Saskatchewan.

In Alberta, 83 sections of land received compensation payments in three or more of the six years between 1964-69. These are ranked in

order of cumulative dollar payments and listed by land location in Table 1, which also includes a list of sections which received payments in only two of the six years but the total paid out exceeded $700. Table 2 ranks 126 sections in Saskatchewan on which insurance payments totalling at least $1,800 were made in two or more years during the five-year period 1965-69. Also included is a listing of sections on which insurance payments were made in four or five years but the total was less than $1,800. Dollar loss figures are not available for Manitoba, but 62 sections of land where damage was reported in at least two of the five years between 1965-69 are listed in Table 3.

Those sections of land listed in Tables 1 and 2 were plotted on 1:250,000 maps, numbered according to their rank in total dollar losses and colored according to the number of years in which compensation payments were made. These maps aided in the selection of priority areas and will be of value in further studies.

In compiling this report it became obvious that neither tables nor maps by themselves would serve to priorize the more chronic damage locations. A clustering of claims might represent frequent and extensive damage which was not intensive. Conversely, a section of land relatively isolated physically from other damage areas might suffer intensive damage in only one or two years out of five. It was found in Alberta, for example, one section (16-44-13-4th) received compensation payments in four of the six years between 1964-69 but the cumulative total was only $759. On the other hand, compensation payments were made on another section (22-37-18-4th) where claims were submitted in only two of the six years but payments totalled $3,859. In Saskatchewan, claims were

made on one land section (26-33-24-3rd) in only two of the five years between 1965-69 but totalled $5,048, while payments made on another section (10-37-22-3rd) in four of the five years totalled only $427. Both intensity and frequency of damage have to be considered in the selection of priority regions for further study. The 1:250,000 scale maps which were compiled from Tables 1 and 2 were found to be especially helpful in this regard.

The data used from the three reports reflects only the reported damage between 1964-69 and does not present a total picture. The Manitoba report includes only those complaints acted upon by provincial wildlife officers and no information is available on dollar loss or how many farmers have learned to attend to their problem without requesting a scare permit or other assistance from the Wildlife Branch. In Saskatchewan, the payment of premiums on depredation insurance has both advantages and disadvantages. Those farmers situated in traditional depredation areas are fairly well allowed for, but there is no means of reimbursing or knowing the numbers of farmers who suffer damage on under-insured or un-insured crops. There appears to be a tendency for some insured landowners to submit claims on even the slightest loss, and it is suspected by some that efforts at scaring depredating birds from insured fields is something less than whole-hearted in certain cases. The results of an Alberta questionnaire indicated that only 12% of the farmers sustaining damage in 1968 were reimbursed via the compensation fund (RRCS, 1969:119). Undoubtedly the unawareness of the fund by the farming public was largely responsible, and the $25 inspection fee may have also played some lesser role.

As previously stated, there is a paucity of information on the numbers of waterfowl present on the prairies immediately prior to and during the grain harvesting period from year to year. Where estimates have been attained on the more traditional staging lakes, the proportion of mallards and pintails has not always been recorded. Far less is known of the numbers of birds visiting individual fields, or even the number and location of fields visited. It should be pointed out, however, that many lakes are known to traditionally harbor depredating waterfowl, and that the general feeding patterns of these birds have become relatively well known. Also, several individual but small scale studies have been conducted, especially within the past two years, but cannot provide information which can be correlated on a provincial or regional basis. If numbers of waterfowl are to be an integral part of an overall approach toward solving the depredation problem, it appears mandatory that a concerted effort be put forth in that singular direction.

The inherent differences among the programs administered by the three provinces would not allow for a priority ranking of local areas on a prairie-wide basis. Manitoba, as has been pointed out, does not reimburse farmers for crop losses, so that magnitude of actual dollar loss in the period under consideration cannot be measured. The differences between the Alberta compensation program and the Saskatchewan insurance program will not allow comparison of priorities between these two provinces, either.

Certain locales within Alberta and Saskatchewan have been delineated as priority areas within each province, however, by combining frequency and extent of susceptibility with intensity of damage. Tentative priority

areas were visually selected by observing the clumping of damage claims on the 1" = 12 mile maps, and substantiated or eliminated by consulting the tables and 1:250,000 scale maps. Only those areas which were considered to be chronic in terms of both frequency and intensity were delineated. As a rough and arbitrary guideline in delineating priority areas, units of 15 or 16 square miles (2 x 8 miles, 3 x 5 miles, 4 x 4 miles) were selected and evaluated. No attempt has been made to number or rank the priority areas within each province at this time. It was felt any priority ranking should include both comprehensive information on waterfowl numbers effecting damage and an evaluation of local efforts at preventing loss. The 23 priority areas for Alberta and the 20 priority areas for Saskatchewan are listed in Tables 4 and 5 respectively. Common landmark names have been assigned to each area, and areas are ranked by cumulative dollar payments made within recent years in the 15 or 16 section block of land. The lower ceiling on maximum reimbursement in Alberta ($15/acre compared to $25/acre in Saskatchewan) and relative unawareness of the Alberta program may play a large part in explaining the lower dollar loss figures for Alberta. The Manitoba priority areas were selected from the compiled 1"= 12 mile map which shows clumping of claims, and from Table 3, which lists frequency of damage occurrence. In Manitoba, 13 aggregations of sections suffering recurrent damage are considered to be priority areas and are listed in Table 6.

A large but undetermined proportion of depredation in each province occurs outside the areas listed in Tables 4-6. Most, but not

all, the sections listed in Tables 1 and 2 are included within the priority Tables 4-5. As additional information becomes available, the priority areas should be re-examined and updated and new areas added, where warranted. Elimination of farmers' losses in the priority areas delineated in this report would go far toward reducing the depredation problem in each province but could not solve the problem entirely.

Most of the priority areas which have been listed in Tables 4-6 are in close proximity to lakes and/or marshes that may logically be suspected to serve as important staging areas for waterfowl or roosting areas for sandhill cranes. In order to use the numbers of waterfowl causing damage to select or rank priority areas, intensive censusing of staging areas and migration stops is a necessity. The numbers of mallards and pintails using these lakes will have to be determined, as well as the seasonal chronology of migration. The major lakes and marshes in each priority area suspected to harbor depredating waterfowl during the harvest period have been included in Tables 4-6. A complete listing of all sloughs, potholes, creeks, and streams which may be used by staging waterfowl has not been attempted.

Summary

1. Damage to grain crops by migratory waterfowl has long been recognized as a serious problem in the Canadian prairies. None of the prairie provinces provide 100% compensation to all farmers suffering depredation losses.

2. Each prairie province has evolved its own depredation amelioration program, none of which solved the problem on a province-wide basis during 1964-69. Each individual program has both shortcomings and advantages when compared with the others.

3. Each provincial government established and operated lure crop areas in 1970.

4. Precise annual dollar losses to the farming public cannot be calculated from existing data, but the number of complaints increased on the prairies between 1965 and 1969.

5. Existing information on the numbers of waterfowl contributing to crop damage is not adequate and could not be used as a criterion in the selection or ranking of priority areas in any province.

6. Both intensity and frequency of damage over the years have to be considered in the selection of priority areas. Both are important, but neither is dependent on the other, nor is there always a direct relationship.

7. Priority areas within each province have to be evaluated on their own merits and are subject to change. No attempt was made to rank priorities within each province.

8. The ranking of priority areas within each province should include consideration of the numbers and types of birds causing the damage and the amount of local effort directed toward preventing or reducing damage.

9. The differences in provincial schemes and programs does not allow for a comparative ranking of priority areas on a prairie-wide basis. An estimate of annual dollar loss in Manitoba is not available for 1965-69 and steps should be taken to arrive at some realistic measure of intensity for recent years or at least in future years.

10. There are 23 areas in Alberta, 20 areas in Saskatchewan and 13 areas in Manitoba where depredation is considered to be chronic. These areas have a past history of recurrent damage of high intensity and should be the first to be considered in any large scale plan to reduce farmers' losses. Areas may be added to or deleted from Tables 4-6 as new information becomes available.

11. Those wetlands listed in Tables 4-6 may be the minimum number which should be intensively censused each fall in order to make any correlation between waterfowl numbers and amount of depredation.

12. A significant amount of crop damage occurs in each province outside the high priority areas. Regions where either intensive or extensive damage occur but do not overlap should not be overlooked in formulating long-term policy.

13. The assessment of new depredation information should continue and should be evaluated as it becomes available. Updating of this report with 1970 data may shed new light on various aspects of the findings.

14. Phase II should include confirmation or rejection and substitution of the suspected staging and migration lakes listed in Tables 4-6 and should also include tabulation of whatever meager data exists on fall waterfowl numbers.

Acknowledgements

Gratitude is expressed to the provincial governments of Alberta, Saskatchewan, and Manitoba and to their wildlife agencies for making available the data used for this report. Special thanks are due to Dr. S. B. Smith of the Alberta Fish and Wildlife Division for making available the 1969 damage claim vouchers; to Messrs. Ross MacLennan and Dave Gray of the Saskatchewan Wildlife Branch for advice and acquisition of additional information; Mr. R. Webb of the Manitoba Wildlife Branch for advice and information on depredation in that province; to the staff of Renewable Resources Consulting Services Ltd., for advice and for assistance in the acquisition and treatment of data; and to Mr. R. Isbister and Mrs. R. Baumann who assisted in the preparation of maps and collation of data.

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Table 1. Locations of 83 sections of land in Alberta ranked by total depredation compensation payments made during three or more years in the six-year period 1964-69.*

Rank	Sec Twp Rge Mer	$ Paid	No. Years
1	28- 35- 14- 4	4904	4
2	27- 58- 11- 4	3928	5
3	11- 80- 7- 6	3595	5
4	15- 56- 16- 4	3580	4
5	32- 71- 5- 6	3577	4
6	11- 72- 7- 6	3476	4
6A	4- 72- 6- 6	3333	3
6B	10- 75- 15- 5	3272	3
7	2- 74- 7- 6	3147	5
7A	23- 75- 15- 5	3024	3
7B	24- 59- 12- 4	2967	3
8	12- 60- 19- 4	2846	4
8A	18- 56- 15- 4	2670	3
8B	19- 51- 16- 4	2667	3
8C	5- 71- 7- 6	2658	3
8D	1- 50- 12- 4	2564	3
9	7- 72- 5- 6	2470	5
10	22- 56- 16- 4	2437	5
11	4- 41- 6- 4	2398	4
11A	33- 41- 19- 4	2270	3
12	5- 54- 6- 4	2219	4
13	15- 52- 17- 4	2149	3
14	7- 60- 11- 4	2134	6
15	25- 33- 12- 4	2049	4
16	21- 37- 2- 4	2025	4
16A	35- 67- 17- 4	2004	3
16B	35- 52- 18- 4	1839	3
16C	10- 53- 5- 4	1765	3
16D	20- 74- 8- 6	1757	3
16E	9- 71- 7- 6	1751	3
16F	17- 42- 11- 4	1744	3
17	5- 49- 15- 4	1708	5
17A	7- 43- 11- 4	1574	3
17B	8- 58- 10- 4	1537	3
17C	20- 79- 21- 5	1445	3
18	6- 72- 6- 6	1444	4
18A	29- 56- 11- 4	1439	3
18B	22- 75- 15- 5	1428	3
18C	17- 9- 13- 4	1417	3
18D	12- 52- 14- 4	1415	3
18E	26- 59- 11- 4	1365	3
19	21- 71- 7- 6	1363	4
19A	23- 58- 10- 4	1316	3
20	15- 36- 1- 4	1291	4
20A	8- 50- 3- 4	1276	3
21	19- 71- 6- 6	1273	4
21A	17- 58- 13- 4	1268	3
21B	19- 71- 2- 6	1266	3
21C	6- 67- 17- 4	1241	3
21D	14- 41- 1- 5	1237	3

Table 1. Continued...

Rank	Sec Twp Rge Mer	$ Paid	No. Years
21E	17- 42- 19- 4	1184	3
21F	17- 40- 20- 4	1142	3
21G	10- 78- 20- 5	1141	3
21H	16- 80- 7- 6	1124	3
21I	9- 79- 21- 5	1116	3
22	26- 44- 13- 4	1103	4
23	7- 62- 24- 4	1037	4
23A	30- 35- 12- 4	1014	3
23B	3- 43- 14- 4	996	3
23C	32- 59- 18- 4	981	3
23D	8- 46- 18- 4	945	3
23E	16- 36- 1- 4	938	3
24	17- 47- 2- 4	937	4
24A	3- 74- 7- 6	899	3
24B	22- 80- 7- 6	876	3
24C	34- 37- 11- 4	820	3
24D	2- 74- 8- 6	813	3
24E	28- 32- 3- 4	764	3
25	16- 44- 13-4	759	4
25A	30- 50- 7- 4	750	3
25B	17- 41- 23- 4	709	3
25C	6- 84- 4- 6	699	3
25D	18- 54- 6- 4	690	3
25E	18- 60- 11- 4	686	3
25F	25- 71- 7- 6	666	3
25G	6- 73- 7- 6	656	3
25H	35- 48- 3- 4	651	3
25I	11- 44- 20- 4	625	3
25J	10- 46- 19- 4	598	3
25K	18- 74- 8- 6	417	3
25L	13- 19- 14- 4	279	3
25M	20- 54- 21- 4	267	3
25N	24- 19- 14- 4	209	3

*locations of 71 sections on which compensation was paid in only two years but total payments exceeded $700:

1-19-16-4
10-13-22-4
1-18-22-4
26-21-21-4
7-28-1-4
36-28-2-4
31-28-14-4
32-32-15-4
1-33-3-4
19-33-11-4
5-34-8-4
10-35-9-4
9-35-18-4
31-36-13-4
22-37-18-4
28-39-2-4
16-39-7-4
8-40-17-4
5-41-1-4
27-43-13-4
29-44-12-4
11-44-13-4
15-45-11-4
6-48-2-4
23-48-3-4
28-48-4-4
2-50-4-4
2-50-6-4
21-51-14-4
19-53-6-4
11-55-7-4
13-56-16-4
16-58-10-4
1-58-11-4
11-58-11-4
8-58-13-4
2-59-11-4
33-59-18-4
25-60-19-4
28-61-5-4
10-63-7-4
17-63-7-4
33-68-20-4
7-37-1-5
7-75-15-5
19-75-16-5
18-77-22-5
29-77-25-5
3-78-21-5
7-78-25-5
18-79-21-5
21-79-22-5
32-70-7-6
25-70-8-6
31-71-5-6
18-71-6-6
6-71-7-6
17-71-7-6
35-71-7-6
15-72-5-6
16-72-6-6
30-73-4-6
25-73-5-6
15-73-6-6
5-73-7-6
4-74-7-6
7-74-8-6
21-74-8-6
36-78-2-6
11-80-7-6
7-84-4-6

Table 2. Locations of 126 sections of land in Saskatchewan ranked by total depredation insurance payments made during two or more years in the five-year period 1965-69.*

Rank	Sec Twp Rge Mer	$ Paid	No. Years
1	36- 34- 16- 2	29,305	5
2	28- 38- 22- 3	18,186	4
3	14- 38- 15- 2	11,228	5
4	10- 38- 15- 2	11,005	5
5	8- 38- 15- 2	9,803	5
6	15- 38- 15- 2	8,653	5
7	27- 33- 24- 3	8,213	5
8	16- 39- 19- 3	7,478	5
9	12- 38- 16- 2	7,115	5
10	4- 38- 15- 2	6,619	5
11	1- 35- 16- 2	6,551	4
11A	18- 39- 18- 3	6,287	3
12	21- 38- 15- 2	6,127	5
13	7- 38- 15- 2	6,022	4
14	5- 35- 15- 2	5,718	4
15	22- 38- 15- 2	5,580	4
16	35- 42- 12- 3	5,338	4
17	16- 38- 23- 3	5,288	5
17A	26- 34- 16- 2	5,267	3
17B	26- 33- 24- 3	5,048	2
17C	11- 4- 18- 2	5,043	3
18	17- 38- 15- 2	4,947	5
19	17- 34- 16- 2	4,846	5
20	23- 38- 15- 2	4,765	5
20a	19- 24- 3- 2	4,763	2
21	6- 39- 24- 3	4,584	4
22	19- 36- 27- 3	4,433	4
22A	2- 39- 13- 2	4,414	3
22B	20- 41- 19- 3	4,407	3
23	17- 37- 28- 3	4,344	5
24	1- 35- 17- 2	4,336	5
25	20- 33- 18- 2	4,246	5
25A	30- 38- 15- 2	4,190	3
25B	26- 43- 11- 2	4,180	3
26	1- 31- 29- 3	4,102	4
27	28- 34- 16- 2	4,126	5
28	19- 38- 15- 2	4,063	4
28a	33- 43- 2- 3	4,019	2
29	28- 38- 23- 3	3,837	4
30	1- 29- 25- 3	3,831	5
30A	18- 34- 16- 2	3,720	3
31	3- 38- 15- 2	3,638	4
32	30- 33- 14- 2	3,585	5
32a	9- 30- 20- 2	3,450	2

Table 2. Continued...

Rank	Sec Twp Rge Mer	$ Paid	No. Years
33	24- 38- 15- 2	3,480	4
33A	14- 39- 13- 3	3,460	3
33B	29- 43- 2- 3	3,375	3
34	4- 35- 15- 2	3,366	4
35	29- 39- 25- 3	3,365	4
35A	1- 38- 16- 2	3,340	3
35B	35- 47- 20- 3	3,309	3
35C	28- 39- 22- 3	3,293	3
36	18- 33- 18- 2	3,281	5
37	20- 36- 27- 3	3,202	5
38	9- 38- 15- 2	3,105	5
38A	23- 35- 16- 2	3,103	3
38B	12- 30- 20- 2	3,095	3
39	4- 48- 18- 3	3,065	4
39A	20- 60- 17- 3	3,056	3
40	31- 38- 15- 2	3,008	4
40A	33- 33- 18- 2	2,993	3
41	6- 38- 15- 2	2,933	5
41a	22- 37- 15- 2	2,919	2
42	14- 39- 25- 3	2,842	4
43	8- 37- 15- 2	2,816	5
44	10- 34- 18- 2	2,805	4
45	5- 38- 15- 2	2,790	4
46	26- 40- 16- 2	2,774	4
47	10- 59- 16- 3	2,764	4
48	3- 35- 15- 2	2,738	4
48a	13- 38- 16- 2	2,730	2
49	34- 33- 14- 2	2,715	5
50	31- 37- 14- 2	2,676	4
50A	28- 30- 26- 3	2,575	3
50B	3- 48- 18- 3	2,552	3
51	5- 40- 17- 3	2,534	4
51a	11- 29- 23- 2	2,516	2
51b	3- 36- 19- 3	2,507	2
51c	27- 39- 19- 3	2,481	2
52	22- 10- 25- 2	2,458	4
52A	21- 37- 23- 3	2,450	3
53	27- 33- 14- 2	2,398	5
54	9- 34- 18- 2	2,381	4
55	6- 38- 12- 2	2,380	5
55A	5- 37- 15- 2	2,373	3
56	19- 33- 18- 2	2,328	4
56A	16- 37- 28- 3	2,315	3
57	19- 33- 25- 3	2,305	4
57A	29- 53- 11- 2	2,262	3
58	24- 34- 27- 3	2,235	4

Table 2. Continued...

Rank	Sec Twp Rge Mer	$ Paid	No. Years
58A	13- 47- 18- 3	2,216	3
58b	29- 34- 16- 2	2,214	2
59	24- 40- 25- 3	2,199	4
59A	17- 38- 24- 3	2,184	3
59B	34- 39- 16- 2	2,184	3
60	1- 38- 15- 2	2,163	4
60a	17- 39- 23- 3	2,155	2
60B	29- 33- 18- 2	2,135	3
61	21- 34- 16- 2	2,133	4
62	13- 38- 24- 3	2,117	5
62a	16- 38- 20- 3	2,100	2
62B	12- 33- 24- 3	2,092	3
62C	30- 39- 21- 3	2,072	3
62D	15- 39- 13- 3	2,064	3
62E	10- 10- 24- 2	2,044	3
62F	1- 43- 13- 3	2,013	3
62g	4- 39- 23- 3	2,000	2
62H	33- 29- 22- 3	2,000	3
62i	34- 34- 16- 2	1,996	2
63	21- 38- 23- 3	1,990	4
63a	32- 18- 20- 2	1,980	2
63b	13- 32- 18- 2	1,979	2
63c	20- 31- 18- 2	1,961	2
63d	11- 35- 28- 3	1,948	2
64	24- 36- 28- 3	1,945	4
65	1- 26- 24- 2	1,919	4
65A	13- 36- 27- 3	1,908	3
66	27- 39- 28- 3	1,900	5
66a	20- 27- 23- 2	1,894	2
67	8- 59- 16- 3	1,840	4
67A	26- 10- 25- 2	1,834	3
67B	33- 18- 20- 2	1,833	3
67c	12- 59- 17- 3	1,822	2
67d	11- 39- 26- 3	1,813	2
67e	27- 10- 25- 2	1,806	2
67f	27- 40- 22- 3	1,800	2

*locations of 22 sections on which insurance claims were paid in 4 or 5 years but total payments did not exceed $1800:

15-33-14-2
16-33-14-2
22-33-14-2
12-35-17-2
23-38-16-2
26-39-16-2
35-39-16-2
22-35-24-3
3-37-22-3
10-37-22-3
12-37-27-3
17-37-27-3
1-38-25-3
36-38-25-3
23-39-19-3
20-39-21-3
22-39-25-3
26-39-25-3
30-39-25-3
1-39-26-3
22-51-19-3
7-52-12-3

Table 3. Location of 62 sections of land in Manitoba on which damage was reported in two or more years during the five-year period 1965-69.

Sec.	Twp.	Rge.	Prin. Mer.	No. Years
32	31	9	W	4
20	17	9	E	3
7	15	6	E	3
12	15	5	E	3
8	16	4	E	3
31	23	4	E	3
16	13	6	W	3
25	13	7	W	3
27	13	7	W	3
36	13	7	W	3
23	31	9	W	3
4	32	9	W	3
27	17	11	W	3
22	54	28	W	3
8	55	28	W	3
14	55	28	W	3
19	55	28	W	3
29	14	6	E	2
16	15	6	E	2
19	15	6	E	2
29	15	6	E	2
22	16	4	E	2
19	16	4	E	2
29	16	4	E	2
27	16	4	E	2
7	24	4	E	2
20	24	4	E	2
16	25	4	E	2
30	25	4	E	2
19	18	4	W	2
27	19	5	W	2
34	19	5	W	2
14	13	6	W	2
24	13	6	W	2
29	13	6	W	2
30	13	6	W	2
31	13	6	W	2
1	14	6	W	2
28	13	7	W	2
36	13	8	W	2
2	14	8	W	2
16	14	8	W	2
3	17	9	W	2
11	17	9	W	2

Table 3. Continued...

Sec.	Twp.	Rge.	Prin. Mer.	No. Years
14	17	9	W	2
34	31	9	W	2
35	31	9	W	2
17	32	9	W	2
32	32	9	W	2
20	17	10	W	2
31	17	10	W	2
4	16	11	W	2
9	17	11	W	2
18	17	11	W	2
18	55	27	W	2
19	55	27	W	2
2	55	28	W	2
10	55	28	W	2
13	55	28	W	2
24	55	28	W	2
13	55	29	W	2
14	55	29	W	2

FIGURE 1 LOCATIONS OF WATERFOWL DEPREDATION COMPENSATION CLAIMS PAID (1964-69)

FIGURE 2. LOCATIONS OF WATERFOWL DEPREDATION INSURANCE CLAIMS PAID (1965-69)

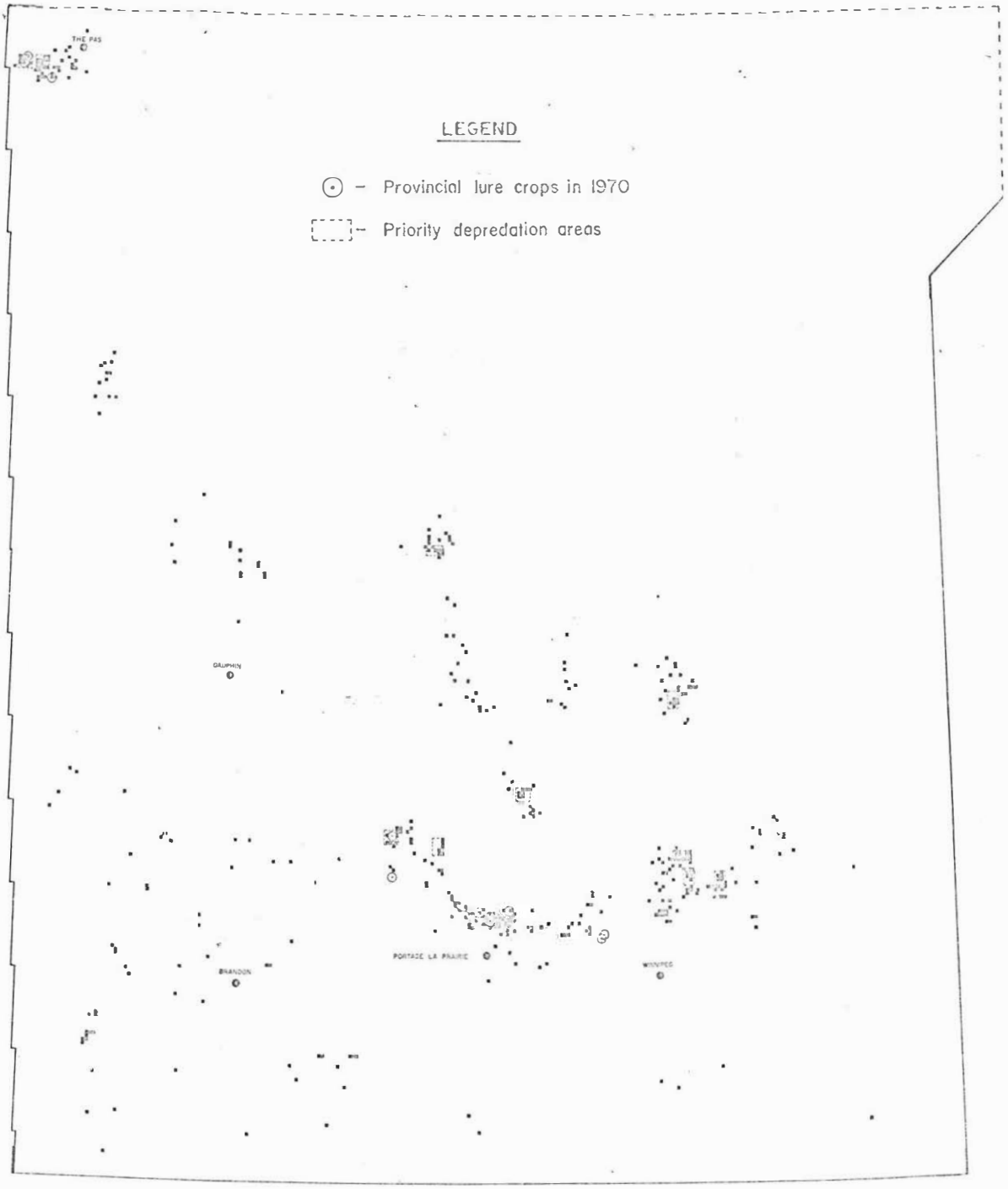

FIGURE 3. LOCATIONS OF WATERFOWL DEPREDATION COMPLAINTS (1965-69)

Table 4. Location of Twenty-three Priority Depredation Areas in Alberta Based on Susceptibility to Recurrent Damage and Total Compensation Claims Paid During 1964-69.

Rank in Province &	Common Name	Location of 15 or 16 Sections Comprising Priority Area	Total $ Paid	Suspected Staging Water
A.	Andrew	7, 8, 17 to 20 -56-15-4 10 to 15, 22 to 24 -56-16-4	$14,907	Whitford Lake
B.	Bear	19, 30, 31 -71-6-6 23 to 26, 35, 36 -71-7-6 6, 7 -72-6-6 1, 2, 11, 12 -72-7-6	$14,040	Bear Lake
C.	High Prairie	2 to 5, 8 to 11, 14 to 17, 20 to 23 -75-15-5	$13,077	Buffalo Bay
D.	Clairmont	31 to 34 -71-5-6 3 to 10, 15 to 18 -72-5-6	$11,556	Clairmont Lake
E.	Dimsdale	31, 33 -70-7-6 4 to 9, 16 to 21 -71-7-6	$10,523	Dimsdale Lake
F.	Jean Coté	7, 8, 9, 16 to 21, 28 to 33 -79-21-5	$10,186	Lac Magloire
G.	Poplar Ridge	8 to 17, 20 to 24 -80-7-6	$ 9,558	Peace River?

Table 4. Cont'd.

Rank &	Name	Location	$ Paid	Water
H.	Smoky	31 to 33 -59-18-4 35, 36 -59-19-4 4 to 9 -60-18-4 1, 2, 11, 12 -60-19-4	$ 9,450	Smoky Lake
I.	Owlseye	1 to 3, 10 to 15, -58-11-4 22 to 27	$ 8,928	Lottie Lake and unnamed to SE.
J.	Buffalo	31 to 35 -73-7-6 2 to 11 -74-7-6	$ 8,411	Jones, Gummer, & Buffalo lakes
K.	Atmore	14 to 17, 20 to 23, -67-17-4 26 to 29, 32 to 35	$ 7,914	Charron Lake
L.	Beaverhill East	9, 10, 11, 14 15, 16, 21, 22 -52-17-4 23, 26, 27, 28, 33, 34, 35	$ 7,435	Beaverhill Lake
M.	La Glace	3 to 10 15 to 22 -74-8-6	$ 6,648	La Glace Lake
N.	Provost	9 to 16 21 to 28 -37-2-4	$ 6,490	Numerous small, may be Sounding Lake
O.	Gough	32 to 36 -35-17-4 1 to 5 8 to 12 -36-17-4	$ 6,431	Gough & Cutbank Lakes
P.	Killam	2, 3, 4, 9, 10 11, 14, 15, 16 -44-13-4 21, 22, 23, 26 27, 28	$ 6,125	Numerous small lakes in vicinity

Table 4. Cont'd.

Rank &	Name	Location	$ Paid	Water
Q.	Ashmont	5 to 8, 17 to 20 -60-11-4 1, 2, 11 to 14, 23, 24 -60-12-4	$ 5,987	Garner and Chappel lakes
R.	Beaverhill West	19 to 23, 26 to 35 -52-18-4	$ 5,350	Beaverhill Lake
S.	Derwent	4 to 9, 16 to 21 -54-6-4 1, 12, 13, 24 -54-7-4	$ 4,936	Numerous small lakes in vicinity
T.	Donalda	20 to 29, 32 to 36 -41-19-4	$ 4,787	Buffalo Lake
U.	Coronation	25 to 29, 32 to 36 -37-11-4 1 to 5 -38-11-4	$ 4,064	Numerous small lakes in vicinity
V.	Edberg	7, 18, 19 -44-19-4 9 to 16, 21 to 24 -44-20-4	$ 3,479	Driedmeat Lake
W.	Paradise Valley	7, 8, 9, 16 to 21, 28 to 33 -47-2-4	$ 3,448	Briker, Becker and nearby lakes

Table 5. Location of Twenty Priority Depredation Areas in Saskatchewan Based on Susceptibility to Recurrent Damage and Total Insurance Claims Paid During 1965-69.

Rank in Province	& Common Name	Location of 15 or 16 Sections Comprising Priority Area	Total $ Paid	Suspected Staging Water
A.	Ponass	1 to 4, 9 to 12, 13 to 16, 21 to 24 -38-15-2	$73,626	Ponass Lake
B.	Little Quill North	3 to 6 -35-15-2 31 to 34 -34-15-2 33 to 36 -34-16-2 1 to 4 -35-16-2	$53,165	Dams on Quill Creek
C.	Ponass West	5, 6, 7, 8, 17, 18, 19, 20, 29, 30 -38-15-2 1, 12, 13, 24, 25 -38-16-2	$49,232	Ponass Lake
D.	Wilkie	18, 19, 30-39-18-3 13 to 16, 21 to 28 -39-19-3	$26,529	Coldspring Lake and unnamed in 22-39-19-3rd
E.	Cactus	17 to 20, 29 to 32 -36-27-3 13, 14 23 to 26 -36-28-3 35, 36	$22,752	Cactus Lake
F.	Little Quill West	8 to 11, 14 to 17, 20 to 23, 26 to 29 -34-16-2	$21,478	Dams on Quill Creek
G.	Superb	10 to 15, 22 to 27, 34, 35, 36 -33-24-3	$16,869	Street Lake and unnamed to south
H.	Big Quill West	19 to 21, 28 to 33 -33-18-2 4 to 9 -34-18-2	$16,125	Big Quill Lake
I.	Ear	16 to 21, 28 to 33 -38-23-3 4, 5, 6 -39-23-3	$15,789	Ear Lake
J.	Salt	13 to 17, 20 to 29 -39-25-3	$12,380	Numerous small lakes in vicinity

Table 5. Cont'd.

Rank &	Name	Location	$ Paid	Water
K.	Little Quill South	9 to 11, 14 to 16, 21 to 23, 26 to 28, 33 to 35 -33-14-2	$10,153	Duck Hunting Creek & dams
L.	Cavalier	25 to 29, 32 to 36 -47-18-3 1 to 5 - 48-18-3	$10,028	Jackfish Lake
M.	Crystal Hill	9, 10, 11, 14, 15 16, 21, 22, 23, 26, 27, 28, 33, 34, 35 -10-25-2	$ 9,383	Numerous small lakes in vicinity
N.	Kutawagan	6, 7, 18 -30-19-2 1 to 4, 8 to 12, 13 to 17 -30-20-2	$ 8,754	Kutawagan Lake
O.	Bjork	7, 18, 19, 30, 31 -43-10-2 11 to 14, 23 to 26, 35, 36 -43-11-2	$ 7,753	Bjork Lake
P.	St. Front	20 to 36 -39-16-2	$ 7,364	Charron and Edouard lakes
Q.	Richard	31 to 35 -42-12-3 1 to 5, 8 to 12 -43-12-3	$ 6,812	Unnamed in 12-43-13-3
R.	Meadow	31 to 34 -58-16-3 36 -58-17-3 3 to 10 -59-16-3 1, 12 -59-17-3	$ 6,425	Meadow Lake
S.	Tobin	29 to 32 -52-11-2 5 to 8, 17 to 20, 29 to 32 -53-11-2	$ 4,822	Tobin Lake
T.	Grill	33, 34, 35 -36-22-3 2, 3, 4, 9, 10, 14, 15, 16, 21, 22, 23 -37-22-3	$ 4,624	Grill Lake

Table 6. Locations of 13 Priority Depredation Areas in Manitoba Based on Susceptibility to Extensive and Recurrent Damage During 1965-69.

Common Landmark Name	Location of 15 or 16 Sections Comprising Priority Area	Number of Complaints	Suspected Staging Water
Delta # 1	6 to 21, 28 to 33 — 13-6-W 13, 24, 25, 36 — 13-7-W	21	Delta Marsh
The Pas East	6, 7, 18, 19 — 55-27-W 1, 2, 3, 10, 11, 12, 13, 14, 15, 22, 23, 24 — 55-28-W	20	Saskeram, Reader, and nearby unnamed lakes
Netly # 1	19 to 23, 26 to 35 — 16-4-E	17	Netly Marsh
The Pas West	5 to 8, 17 to 20 — 55-28-W 1, 2, 11, 12, 13, 14, 23, 24 — 55-29-W	16	Murphy, Carrot, Elm Watkins and Saskeram lakes
Walkeyburg	7, 8, 9, 16 to 21, 28 to 33 — 15-6-E	14	Netly Marsh
St. Martin Stn.	25 to 29, 32 to 36 — 31-9-W 1 to 5 - 32-9-W	14	Sandy Bay and Pineimula Lake
Riverton	36 — 23-3-E 31, 32 — 23-4-E 1, 12, 13, 24 — 24-3-E 5, 6, 7, 8, 17, 18, 19, 20 — 24-4-E	11	Sandy Bay Marsh
Delta # 2	6, 7, 18, 19, 30 — 13-5-W 1, 2, 11, 12, 13, 14, 23, 24, 25, 26 — 13-6-W	11	Delta Marsh

Table 6. (Cont'd)

Common Name	Location	Complaints	Water
Longburn	27 to 34 — 13-7-W 25, 36 — 13-8-W 3, 4, 5, 6 — 14-7-W 1 — 14-8-W	11	Delta Marsh
Big Grass	15 to 22, 27 to 34 — 17-11-W	10	Big Grass Marsh
Langruth	33, 34, 35 — 16-9-W 2, 3, 4, 9, 10, 11, 14, 15, 16, — 17-9-W 21, 22, 23	9	Langruth Marsh
Oak Point	13 to 16, 21 to 36 — 19-5-W	9	Marshy Pt. Marsh
Netly # 2	13, 14, 15, 22 to 27, 34, 35, 36 — 15-4-E 1, 2, 3 — 16-4-E	8	Netly Marsh