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1954 STATUS REPORT OF WATERFOWL

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This information has been hurriedly compiled both in the field and in Washington. Also, the report has not had the benefit of proof-reading or editing and should be regarded as subject to correction. The information contained in this report is for administrative use and is not for publication without permission of the contributing agency.

INTRODUCTION

Included in this report are the results of three major surveys to determine current waterfowl conditions. These are (1) a survey during the 1953-54 shooting season to determine the kill of waterfowl and to evaluate the effect of regulations on kill; (2) a survey of waterfowl wintering grounds during January 1954 to determine the distribution and relative number of birds remaining after the shooting season; and (3) a breeding population and production survey conducted during the current spring and summer for the purpose of forecasting any changes which may occur in the relative size of the fall flight in each Flyway. These data are brought together here for the purpose of supplying administrators with a factual basis for setting the shooting regulations for the 1954-55 season, and for other management purposes.

Inasmuch as waterfowl management within the United States is on the basis of four flyways, this report is organized accordingly. In doing this, the Flyways have arbitrarily been extended beyond the limits of the United States to include the breeding and wintering areas most closely associated with each Flyway. Thus, for winter surveys, Alaska, British Columbia, Alberta and western Mexico have been considered with the Pacific Flyway States; Saskatchewan, eastern and central Mexico with the Central Flyway; Manitoba and Ontario with the Mississippi Flyway; and Quebec, Newfoundland, The Maritimes, and the West Indies with the Atlantic Flyway. Similarly, in summarizing data from the breeding grounds, it has been assumed that birds from Alaska, Northwest Territories, British Columbia, Alberta, and Saskatchewan are important to the Pacific Flyway hunters; that these same areas excepting Alaska and British Columbia supply birds to the Central Flyway; that birds from northern Alberta, Northwest Territories, Saskatchewan, Manitoba, and western Ontario move through the Mississippi Flyway; and that northern and southern Canada from Saskatchewan to Newfoundland supply waterfowl to the Atlantic Flyway.

It will be noticed that most of the breeding areas supply birds to two or more Flyways. Although banding information has indicated in a general way the connection between the various breeding areas and the four Flyways, information is lacking concerning the number of birds which move from each breeding area to the Flyways. Changes in the banding program are necessary before this information can be obtained. These changes have been made, and an enlarged banding program is underway at the present time across southern Canada and in several of the northern States. Twelve States have supplied men to the cooperative banding crews operating in Canada this year for the first time. Information should be forthcoming in the near future which will allow for a division of the breeding pair and production index figures into the portions affecting each of the four Flyways. With this information, forecasts of changes in the relative size of the fall flights in each Flyway should become more precise.

SCOPE OF INVESTIGATIONS AND METHODS USED

Waterfowl Kill

During the 1952-53 waterfowl shooting season the Fish and Wildlife Service inaugurated a new method of measuring the waterfowl kill. The method functions through the cooperation of the Post Office Department and provides for a sampling of the hunters in each Flyway in proportion to their occurrence in the various States. The objectives of the kill survey are to determine for each Flyway (1) the number of birds taken by hunters with an error not to exceed 5 percent; (2) the size of the average daily bag; and (3) the average number of times a hunter went afield during the season.

The mailing addresses for the questionnaire survey are obtained at the time duck stamps are purchased at Post Offices. The questionnaires are mailed out on the closing date of the shooting season in each State. Three weeks later, a follow-up questionnaire is mailed to those who have not answered the first questionnaire. The number of questionnaires mailed out and the number returned in each Flyway is shown in the following table:

Flyway	Questionnaires Sent Out		Questionnaires Returned		Percent Returned	
	1952-53	1953-54	1952-53	1953-54	1952-53	1953-54
Atlantic	3,091	6,643	2,449	4,645	79.2	69.9
Mississippi	3,995	11,549	3,130	8,126	78.4	70.4
Central	2,644	7,035	1,988	4,560	75.2	64.8
Pacific	2,828	7,903	2,334	5,601	82.5	70.9
Total	12,558	33,130	9,901	22,932	78.8	69.2

Winter Survey of Waterfowl Distribution and Conditions

The annual waterfowl survey to obtain information on wintering conditions and distribution covered the major wintering grounds of known importance in Alaska, Canada, the United States, Mexico and the West Indies. The cooperative survey was conducted mostly during January. In Alaska, Mexico and the West Indies, the Fish and Wildlife Service organized and conducted the surveys. In the United States the Service organized the survey but most of the field work was performed by personnel of the 48 State Conservation Departments. In Canada the survey was organized by the Canadian Wildlife Service and the field work was conducted by the Service and the Provinces.

The wintering areas were surveyed by use of boats, cars, and aircraft with the important areas being given aerial coverage whenever possible. Although incomplete, all available information on number of men, aircraft involved, and distance covered in the survey is presented in the following table:

Location	No. Observers	No. Planes	No. Miles Flown
Pacific Flyway	472	39	22,601
Central Flyway	412	36	25,000
Mississippi Flyway	457	17	6,660
Atlantic Flyway	520	44	30,660
Total for United States	1,861	136	84,921
Mexico	4	2	9,000
West Indies	2	1	3,000
Grand Total	1,867	139	96,921

Breeding Population and Production Surveys

The extensive breeding ground surveys of the past few years have been continued. These surveys now include two coverages of most of the important waterfowl breeding areas, the first coverage occurring in May for the purpose of measuring the distribution and relative size of the breeding population, and the second being made during July for the purpose of measuring the production of broods. When these data are combined for all of the important breeding areas they form the primary basis for forecasting changes in the relative size of the fall flight in each of the four Flyways.

The survey methods vary from statistically designed sampling techniques using aerial and ground transects, to censuses of sample areas. Aerial crews cover the bulk of the breeding range with the various crews sampling in the neighborhood of 2,375,000 square miles of waterfowl habitat. For the most part, the results of the surveys are presented as "indices to breeding population or number of broods." The determination of an "index" figure representing estimated breeding population or number of broods has been done for the purpose of establishing a basis upon which the results of surveys in one place could be added to the results from others. When considering the "index" figures, however, it is emphasized that they do not constitute an estimate of total population. The "indices" are based on birds seen, and it is

known that when using the aerial method in particular that a portion of the birds are missed. Even though the "index" figures are not a measure of total populations, it is believed that they are representative of relative population levels to the extent that year to year changes can be detected. Although a measure of total population would have certain advantages, a determination of relative changes seems adequate for the purpose of practical management.

Needless to say, the breeding ground surveys are cooperative in nature. The Fish and Wildlife Service, the Canadian Wildlife Service, the Provincial Game Branches, and Ducks Unlimited combine their manpower and equipment to cover all of the important waterfowl breeding areas in Canada. Service Biologists cover the important areas in Alaska, while the State Conservation Agencies, with some help from the Service, carry on surveys in about 25 States.

Pacific Flyway Data

Waterfowl Kill Information

The following table presents the estimated kill of waterfowl during the 1952-53 and 1953-54 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

Species	Total Kill * 1952-53	1953-54	Percent Change
Mallard	2,022,670	1,371,510	- 32.2
Pintail	761,430	993,235	+ 30.4
Am. Widgeon	329,950	376,860	+ 14.2
G-w. Teal	293,250	488,140	+ 66.5
Shoveler	130,420	154,525	+ 18.5
Redhead	115,970	30,120	- 74.0
Other Ducks	251,080	313,551	+ 24.9
Total Ducks	3,904,770	3,727,941	- 4.5
Canada Geese**	146,250	147,730	+ 1.0
Snow Geese	40,500	143,390	+254.0
White-fronts	34,200	67,350	+ 96.9
Brant	25,350	23,905	- 5.7
Other Geese	790	-	-
Total Geese	247,090	382,375	+ 54.8
Coot	143,000	161,611	+ 13.0

* Includes both retrieved and unretrieved birds.
** Includes all white-cheeked geese.

Number of Hunters, Daily Kill, Seasonal Kill, and Average Times Hunted as Determined by the Waterfowl Hunter Mail Survey

		1952-53	1953-54	Percent Change
Number of Hunters				
Over 16		466,039	426,033	- 8.6
Under 16		32,768	39,984	+ 22.0
Average Daily Bag				
Over 16	Ducks	1.55	1.75	+ 12.9
	Geese	.10	.17	+ 70.0
	Coot	.04	.06	+ 50.0
Under 16	Ducks	.43	.58	+ 34.9
	Geese	.08	.05	- 37.5
	Coot	.12	.10	- 16.7
Average Seasonal Bag				
Over 16	Ducks	6.78	7.16	+ 5.6
	Geese	.45	.71	+ 57.8
	Coot	.17	.24	+ 41.2
Under 16	Ducks	1.88	2.39	+ 27.1
	Geese	.33	.21	- 36.4
	Coot	.52	.43	- 17.3
Average Times Hunted		4.38	4.10	- 6.4

These data indicate that the over-all kill of ducks in the Pacific Flyway did not change between the 1952-53 and the 1953-54 seasons, while the kill of geese and coot both increased considerably. It is of interest to note that there was a decrease of 40,006 in the number of adult hunters (duck stamp purchasers). With the total kill of ducks remaining about the same, the decrease in number of hunters was compensated for by an increase in the average daily and seasonal kill.

Winter Trend Data - Pacific Flyway

In the PACIFIC FLYWAY survey conditions were generally satisfactory for obtaining good counts. Surveys in Alaska were delayed in the Kodiak and Wrangell areas by adverse weather. In British Columbia above normal precipitation and mild weather created considerable open water and waterfowl were dispersed widely. Washington experienced above average rainfall with typical winter conditions. Weather conditions in Idaho were favorable for the survey with the main water areas of the State generally open. Blizzards in Montana delayed the survey but no adverse weather was experienced in Utah during the period. Oregon water conditions west of the Cascades were not as favorable to waterfowl as in past years due to reduced fall rainfall but east of the Cascades water levels were above normal. Except for high winds on January 7, survey conditions in Nevada were considered very good. The winter in California was mild and conditions were satisfactory during the survey for obtaining good counts and aerial photographs. Arizona had normal winter weather but experienced below normal water levels. Conditions were satisfactory during the survey flights in Mexico where water levels were generally good, with only local exceptions.

Percent Change in Pacific Flyway (Continental) Population Index Figures for Ducks, Geese, Brant, Swan and Coot - January 1953 to January 1954

(Comparable Coverage)

Area	Ducks	Geese	Brant	Swan	Coot	Total
Alaska	- 6.2	+ 17.0	-	-	-	- 5.1
Canada*	-21.6	- 18.2	+85.0	+ 8.7	- 57.3	-23.5
Pacific Flyway States	+ 4.1	- 8.0	-31.3	- 4.4	+ 49.4	+ 6.7
Mexico, West Coast	+50.6	+143.5	- 1.8	-	+145.4	+48.8
Total	+ 6.2	- 7.3	-14.4	- 3.4	+ 46.8	+ 8.0

* British Columbia and Alberta.

Species Composition - Pacific Flyway (Continental) 1953 and 1954

(Comparable Coverage)

Species	Percent of Birds Identified 1953	1954	Percent Change 1953-1954
Pintail	27.1	26.7	+ 5.5
Mallard	20.9	20.1	+ 2.8
Coot	8.8	12.1	+ 46.8
Baldpate	10.1	11.2	+ 19.6
Shoveler	5.4	5.0	- .2
Scaup	4.5	4.2	+ 1.2
Snow Goose	4.4	3.3	- 18.8
G-w. Teal	2.9	2.9	+ 6.9
Canada Goose	2.0	2.3	+ 23.1
Scoter and Eider	2.5	2.1	- 14.1
Cackling Goose	2.5	1.8	- 21.3
White-F. Goose	1.7	1.7	+ 8.8
Black Brant	1.7	1.4	- 20.9
Goldeneye	1.1	.8	- 17.9
Ruddy duck	.9	.8	- 7.5
Gadwall	.9	.7	- 10.2
Canvasback	.6	.6	+ 11.1
Bufflehead	.5	.5	- 5.0
Tree ducks	tr.	.4	-
Merganser	.3	.4	+ 38.2
Redhead	.3	.4	+ 37.3
Whistling Swan	.3	.3	- 5.3
B-w. & Cinn. Teal	.3	.2	- 46.0
Old Squaw	.1	.1	- 5.9
Ringneck	tr.	tr.	-
Ross' Goose	tr.	tr.	-
Wood Duck	tr.	tr.	-
Trumpeter Swan	tr.	tr.	-
Emperor Goose	tr.	tr.	-
Total	100.0	100.0	+ 8

Summary of Pacific Flyway Waterfowl Indices

An upward trend is shown by the waterfowl indices in the Pacific Flyway for the 5-year period 1950-54.

Waterfowl - The 1954 index for waterfowl is 12 percent above the average level for the 5-year period 1950-54 and compared to individual years is:

8 percent above 1953
18 percent above 1952
13 percent above 1951
26 percent above 1950

Ducks - The 1954 index for the Pacific Flyway is 13 percent above the average level for the past 5 years and compared to individual years is:

6 percent above 1953
14 percent above 1952
28 percent above 1951
19 percent above 1950

Among the ducks, the indices were:

1. About the same for: pintail, mallard, shoveler, scaup, green-winged teal, ruddy, gadwall, bufflehead and old squaw.
2. Noticeably up for: baldpate, merganser and redhead.
3. Noticeably down for: blue-winged teal and cinnamon teal.

Geese - The 1954 goose index is 17 percent below the average for the 5-year period 1950-54 and compared to individual years is:

7 percent below 1953
4 percent below 1952
52 percent below 1951
19 percent above 1950

Among the species of geese, the white-fronts remained about the same, cacklers and snows decreased, and Canadas increased.

Brant - The black brant index is 8 percent below the average for the 5-year period 1950-54 and compared to individual years is:

14 percent below 1953
21 percent below 1952
21 percent above 1951
12 percent below 1950

Coot - The 1954 coot index is 55 percent above the 5-year average and compared to individual years is:

47 percent above 1953
113 percent above 1952
44 percent above 1951
165 percent above 1950

ALASKA

Breeding Ground Surveys

Weather and Water Conditions -

This year, spring was "late" in southern Alaska, but "early" in northwestern Alaska. No unusually high water was reported anywhere, and much of the interior began the summer with water levels below normal. This was particularly true of those lakes and ponds in the Ft. Yukon Flats that are not connected to the main river drainages. These waters apparently depend on periodic floods to fill them to capacity. Nevertheless, it is not expected that water shortage will adversely affect production anywhere.

As of early June, weather and water conditions appear conducive to at least a normal waterfowl production in Alaska.

Breeding Population Indices -

The 1954 aerial surveys of Alaskan waterfowl breeding populations were designed to obtain a stratified random sample of the major breeding grounds south of the Brooks Range. The Seward Peninsula, Aleutian Islands, and Southeastern Alaska were entirely omitted, and surveys were generally restricted to areas within which breeding densities were estimated at one pair per square mile or greater. Areas surveyed were combined into six strata, with sampling intensities jointly proportional to the relative area and the variance previously experienced in each stratum. Sampling intensity averaged 0.2% for all strata.

Table I presents the data collected during the 1954 survey and the total population index figures obtained during 1953. A 20 percent increase in breeding population is indicated.

Production Indices -

Aerial brood surveys, begun experimentally in 1953, were continued on a limited basis again this year.

It has not been possible to develop a comparative index to number of broods produced over any large portion of the Alaskan breeding grounds. In lieu thereof, indices calculated for the Minto and Ft. Yukon study areas are presented in Table II. Surveys in 1953 did not consider potential late broods, and therefore the 1954 figures are presented exclusive of this factor.

Table I - Results of Spring Aerial Surveys - Breeding Population Data

Location	Area in Sq. Mi.	Mean Density Pairs Per Sq. Mi.	Population Index Total Breeding Pairs	1953 Population Index - Total Breeding Pairs
Misc. Low Density Areas	189,120	0.9	170,208	153,376
Lower Innoko	3,584	1.7	6,093	9,641
Selawik	1,472	5.2	7,654	12,512
Susitna	7,638	1.9	14,512	14,665
Stratum 1 - Total	201,814	1.1	221,995	190,194
Alaska Peninsula	14,144	4.2	59,405	40,028
Upper Innoko	2,624	8.0	20,992	4,723
Kobuk Delta	760	8.5	6,460	3,800
Yukon Delta	24,960	3.2	79,872	62,400
Stratum 2 - Total	42,488	4.1	174,201	110,951
Stratum 3 - Koyukuk	6,464	2.6	16,806	17,065
Stratum 4 - Lake Louise	8,384	4.0	33,536	85,684
Minto Lakes	2,048	11.1	22,733	25,150
Fort Yukon Flats	18,368	10.0	183,680	153,556
Tanana-Kuskokwim	30,720	3.6	110,592	62,976
Stratum 5 - Total	51,136	5.6	286,362	241,682
Stratum 6 - Copper River Delta	1,536	39.1	60,058	17,403
All Strata Combined	311,822	2.6	798,264	662,790

Table II - Index to Brood Production on Two Sample Areas

Location	Year	Area Surveyed in Sq. Miles	Period of Survey	Methods of Survey	Index Broods per Sq. Mi.*	Percent Change
Minto Flats	1954	450	7/12-14	Aerial	6.22	+ 31
	1953	450	7/18	Aerial	4.75	
	Remarks: All supplementary observations indicate an increase of at least 30 percent over last year.					
Fort Yukon Flats	1954	24	7/12-17	Complete Ground Coverage	8.4**	- 28
	1953	24	7/1-14	Partial Ground Coverage	11.6***	
	Remarks: Due to late nesting, scaup broods were not present at time of 1954 survey. Apparent decrease may be attributable in part to population shifts and changes in survey methods.					

* Calculated potential late broods not included in data compared.

** Scaup not hatched.

*** Corrected to omit scaup.

Data available for comparison are irregular, and no widespread certain changes in brood size can be identified. At Minto, however, a definite reduction in brood size was noted, and indications of a general reduction in size were reported from Ft. Yukon. At Minto, the reduction in brood size will be more than offset by the increased number of broods, but at Ft. Yukon a lowered final production may be the result.

Conclusions -

In at least one area (Minto), a healthy increase in fall flight is anticipated. The concensus of opinion is that from other areas, the fall flight will not change appreciably from the 1953 level.

NORTHERN ALBERTA AND NORTHWEST TERRITORIES

Weather and Water Conditions -

Contrasted with 1953, this season was one of the latest on record -- a cold, backward spring with a late break-up. This may well have had an adverse effect on the normal northward migration of waterfowl, as certainly the early arrivals found only ice and snow. Many reports have been received from natives to the effect that waterfowl were seen hovering around open waterholes in near blizzard conditions, and then heading back south. Flooding occurred in the Athasbaska-Lake Claire marshes from the combined action of the Athabaska and Peace rivers, and some nest losses were bound to have occurred. Elsewhere, water conditions were normal, or even improved over 1953. This was particularly true of the Slave Rive Parklands, and the area of close forest north of Great Slave Lake.

Breeding Population Indices -

The following tables give the estimated breeding population indices for 1953 and 1954 according to areas and species:

Estimated Population Indices by Species

SPECIES	1953	1954	PERCENT CHANGE
Scaup	892,138	694,166	- 22.1
Pintail	162,783	166,527	+ 2.3
Mallard	145,755	137,885	- 5.4
Baldpate	117,526	93,668	- 20.3
G. W. Teal	11,964	29,215	+144.2
Goldeneye	14,047	24,653	+ 75.5
Canvasback	17,951	17,323	- 3.5
Bufflehead	16,103	17,166	+ 6.6
Shoveler	15,684	11,716	- 25.3
Redhead	8,232	5,532	- 32.8
Ruddy	1,286	1,137	- 11.6
Gadwall	1,028	1,020	- 0.8
Ringneck	-	9,021	-
Canada Goose	22,302	22,101	- 0.9
W. F. Goose	8,334	7,076	- 15.1
Snow Goose	8,580	7,189	- 16.2
Swan	21,115	16,934	- 19.8
Brant	1,303	1,014	- 22.2

Estimated Population Index (Ducks*) by Areas

AREA	Sq. Mi.	1953	1954	% Change
Lake Claire - Athabaska Delta	2,000	100,744	39,199	- 13.9
Hay Lakes	200	24,768	19,801	- 20.1
Slave River Parklands	4,025	8,112	38,241	+375.0
Precambrian - Forest & Forest Tundra	69,477	255,315	152,849	- 31.3
Close Forest - 60° to 63°30' N. Lat.	41,465	116,433	149,276	+ 28.6
Precambrian Edge	7,180	166,460	115,599	- 30.6
Wooded MacKenzie Delta	3,600	72,362	57,601	- 20.4
Treeless MacKenzie Delta	1,600	40,110	37,079	- 10.4
Upland Tundra	8,655	58,581	34,621	- 41.2
Coastal Tundra	900	2,610	1,620	- 34.1
Forest Tundra N. of 63°30'	96,768	557,538	511,332	- 7.0
Old Crow Flats	1,970	31,554	51,811	+ 64.4
T o t a l	237,840	1,404,497	1,209,029	- 13.9

* Excluding Scoter, Eider, Merganser, and Old Squaw.

Production Indices -

Production surveys were not conducted in this region in 1953 so that no data are available for comparison with data gathered this year. However, at the present time the outlook for production in the far north is not good. Either a reduced breeding population or a late season can cause a reduction in brood production. When they are combined, as they are this year, there seems little reason to doubt that production will decrease.

Conclusions -

With the exception of three rather small areas, the fall flight of waterfowl will be reduced this year from northern Alberta and the Northwest Territories.

A L B E R T A

Weather and Water Conditions -

The 1954 waterfowl breeding season in southern Alberta was delayed about two weeks by a period of unseasonably low temperature accompanied by snow between April 19 and May 2. At that time, it appeared that the season might stand or fall on the record of a single hatch.

Heavy snows in the parklands and northern prairies left water levels in all but the eastern areas in good condition to start the breeding season. Light snow and rain in the south (Stratum C) caused this area to be relatively dry when the birds moved in. General rains in May and June in Strata A and B were sufficient to hold these to a normal rate of summer loss. In Stratum C, where water was badly needed, a continuing drought increased the usual rate of loss. By the end of the first week of July, one half of the below average number of water areas present in May had dried up. Drought conditions are continuing in Stratum C through the present writing (July 23).

Table I. Water Index as Determined by Aerial Transects-May and June 1954

	Stratum A		Stratum B		Stratum C		Province	
	May	July	May	July	May	July	May	July
Ponds Observed	5169	2827	4392	2895	615	329	10176	6096
Ponds/Sq. Mile	19.6	10.9	23.2	15.7	7.6	3.8	18.1	11.4
Percent Loss		-44.4		-32.5		-49.2		-36.7

A Provincial loss of 36.7 is slightly higher than the long-time average and results from the hot dry weather of July and the poor condition of the southern district. Nevertheless, present water conditions throughout the Province are adequate for waterfowl populations present.

Breeding Population Indices -

Table II presents the breeding population index figures which were collected during the May aerial survey. It will be noted that the breeding population may have increased slightly over the high level of last year. Blue-winged teal, green-winged teal and gadwall increased considerably, while pintail registered a moderate decrease.

Table II -

Breeding Population Indices - Southern Alberta *

Species	Average Index 1950 to 1953	1953 Index	% Lone Males	1954 Index	% Lone Males	Percent of Change 1954 Index From Av. (a)	1953 (b)
Mallard	568,130	899,198	79.8	916,460	54.9	+ 61	+ 2
Pintail	676,288	865,960	83.2	711,580	57.1	+ 5	- 18
B-w. Teal	73,362	60,238	24.7	163,316	7.1	+123	+171
G-w. Teal	17,988	9,742	32.4	59,650	6.9	+232	+512
Cinn. Teal	1,418	1,418	42.8	198	33.3	- 86	- 86
Gadwall	24,898	18,294	31.3	50,916	6.9	+104	+178
Baldpate	111,198	172,842	37.4	166,096	8.3	+ 49	- 4
Shoveler	102,754	152,410	46.5	167,058	18.6	+ 63	+ 10
Total Puddlers	1,576,036	2,180,102	73.3	2,234,858	29.3	+ 42	+ 3
Redhead	29,656	40,752	45.9	45,330	9.7	+ 53	+ 11
Canvasback	28,720	35,628	68.5	50,538	25.2	+ 76	+ 42
Scaup	111,794	122,844	36.4	188,942	7.9	+ 69	+ 54
Ruddy	20,784	13,600	67.8	12,640	19.7	- 39	- 7
Buff. & Gldye.	11,986	10,462	59.7	16,568	22.7	+ 38	+ 58
Total Divers	202,940	223,286	45.9	320,930	11.6	+ 58	+ 44
TOTAL DUCKS	1,778,976	2,403,388	70.8	2,555,788	30.8	+ 44	+ 6
Coots	53,018	91,794		167,870		+217	+ 83

* 64,300 Square Miles

Production Indices -

Table III presents the production indices which were obtained during the July survey.

Table III. Aerial Production Data 1953 - 1954

	Strata A		Strata B		Strata C		Province	
	1953	1954	1953	1954	1953	1954	1953	1954
Area in Sq. Mi..	22088	22088	26100	26100	16112	16112	64300	64300
Sample in Sq. Mi.	244.85	263.25	177575	184.5	78.85	85.5	501275	533.25
Tot. Broods Seen	763	1349	514	605	100	96	1377	2050
Brds. sq. mi. seen	3.12	5.12	2.89	3.28	1.26	1.12	2.74	3.37
Est. No. Brds. seen	68915	113091	75429	85608	20301	18045	164645	216744
Pot. later Birds *	332	412	74	172	126	41	532	427
Pot. Brds. Sq. Mi.	1.35	0.81	0.41	0.93	1.61	0.48	1.14	0.78
Pot. Later Birds	29818	17891	10701	84273	25939	7734	66458	39818
Tot. Ind. Birds	1095	1563	588	777	226	137	1909	2477
Brds. sq. mi. ind.	4.47	5.93	3.30	4.21	2.87	1.60	3.88	4.15
Est. No. Brds. Ind.	98733	130982	86130	109881	46240	25779	230782	266642
Aver. Brd. Size	5.47	5.59	5.71	5.78	4.80	5.25	5.51	5.64
Est. No. Ducklings	540070	732189	491812	634912	221957	135340	1252293	1503861
Percent Change		+ 26		+ 23		- 39		+ 17

*Potential later broods. This figure is derived by tallying the pairs, lone mailes and lone females present on the transect in July. For purpose of comparison with 1953 figures we assume that each pair, male or female represents a potential brood and that i will hatch. As this is impossible, we know that this is an inflated figure. In a year such as this, however, we may estimate that between 60% and 75% would be successful.

The average number of broods per square mile actually observed throughout the province was 3.37. Of these, 2.92 broods per square mile were Class II and Class III broods during the period of the survey, July 6 - 20, 1954. Thus it can safely be predicted that the bulk of this year's hatch will be on the wing before any drought can decimate this year's production.

As Class III broods average 5.5 ducklings per brood, duckling losses to predators or to other causes have been light.

Total production indices show a production gain of 26% in Strata A over 1953, the highest index since our aerial surveys began. In Strata B in 1954 the 1954 index of production rose 23% over that of 1953, again the highest figure yet recorded by our surveys. Only Strata C registered a reduction (-39%) when compared with the previous year. Lesser populations in that area in May as well as its relatively minor importance in the overall picture allow for a provincial increase in production of 17% over 1953. In other words, though our breeding population was only 6% above that of last year, it still means that the Alberta waterfowl index for both population and production is the highest in 1954 that it has been since 1947.

Conclusions -

In forecasting the fall waterfowl flight from Alberta, it is now apparent that this province's contribution to the continental waterfowl populations in 1954 will be considerably above the average and somewhat above that of last year.

B R I T I S H C O L U M B I A

Weather and Water Conditions -

The spring of 1954 appears comparable, in many ways, with the spring of 1950. Runoff was much delayed and the season was about three weeks late. In the interior, snow was still present in the bush at elevations about 3000 feet on May 21, and lakes at 3500 feet and above were still frozen tight. During the late spring, lakes and sloughs in the Okanagan and Cariboo valleys were well filled with water. In the upper Columbia Valley the water level rose to more than eight feet above normal. It is condiered that Canada geese, and probably many ducks, suffered a fairly heavy nest loss to flooding in this area.

The cool wet weather of the spring has continued into mid-summer. Water levels in lakes and potholes are noticeably higher this year, in some cases as much as one foot. Water conditions are most favorable to waterfowl production.

Breeding Population Indices -

Following are the results of the aerial survey between May 13 and 18:

Table I. SPRING AERIAL SURVEY - CARIBOO, CHILCOTIN, PRINCE GEORGE AREAS*

	1950	1951	1952	1953	1954
Square Miles sampled	80.3	87.7	75.0	98.3	99.0
Ducks per square mile	9.1	11.3	8.5	10.4	10.2
Canada Geese (total seen)	23	34	17	47	14

* Prince George area not covered in 1954.

Table II. AERIAL SURVEY - COLUMBIA VALLEY

	1950	1951	1952	1953	1954
Ducks per square mile	19.9	10.1	12.0	19.5	26.2
Canada Geese per sq. mile	20.1	17.4	19.7	25.3	19.0
Canada Geese	1,612	1,395	1,575	2,025	1,528
Snow Geese	-	-	-	-	12
Swan	2	10	1	1	29
Mallard	773	402	445	576	309
Baldpate	167	83	155	103	115
G. W. Teal	24	-	15	-	2
B. W. Teal	83	7	-	-	28
Canvasback	27	3	-	10	8
Scaup	18	9	53	3	143
Goldeneye	79	97	65	91	69
Bufflehead	2	21	9	18	75
Others	49	33	88	49	47
Unidentified	376	135	130	705	1,276
TOTAL DUCKS	1,598	790	960	1,555	2,101

The survey was begun a week earlier than in 1953, and this, coupled with the fact that the season was about three weeks late tend to reduce the comparability of the data. It is the opinion of the biologists making the survey that many of the observations represented birds which under normal weather conditions would have been in higher country. For this reason, it is estimated that breeding populations in the Cariboo and Chilcotin areas decreased appreciably over last year, and that there may have been no increase in the Columbia Valley.

Production Indices -

Comparable data are available only from brood surveys conducted between July 13 and 16 in the Cariboo region. These surveys indicate also that the season was about three weeks later than usual. The number of adults seen increased as compared to 1953, while the number of young decreased. Flocks of drake scaup accounted for much of the increase in adults, while the lateness of the season is believed to explain the decrease in young. Following are the data collected from the Cariboo region:

Table III. CARIBOO REGION

	1951		1952		1953*		1954*	
	Adult	Young	Adult	Young	Adult	Young	Adult	Young
Mallard	57	50	129	24	3	17	15	25
Pintail	1	--	10	9	2	4	1	--
Baldpate	63	67	28	64	11	53	11	33
Gadwall	2	16	1	--	1	8	--	--
Green-winged teal	14	37	28	32	4	30	14	16
Blue-winged teal	6	9	4	14	6	7	27	--
Shoveller	1	5	7	21	4	11	--	--
Redhead	21	67	10	72	12	69	13	41
Canvasback	9	22	35	27	8	37	9	12
Lesser Scaup	174	293	212	257	138	87	298	43
Goldeneye	216	306	239	110	55	168	63	141
Bufflehead	42	36	110	68	27	99	43	66
Ruddy duck	36	16	89	19	65	19	56	25
Unidentified	--	--	102	7	--	--	108	--
Total	642	924	1,004	724	336	609	658	402
American coot	369		283		310		205	

* 1953 and 1954 counts made three weeks earlier than previous years--not strictly comparable.

The average brood size for dabbling ducks decreased from 6.4 in 1955 to 5.8, while diving ducks decreased fr m 6.4 to 6.1.

Conclusions -

The indications are that the 1954 hatch will be as good as the 1953 hatch, although somewhat delayed.

W A S H I N G T O N

Weather and Water Conditions -

About half of the potholes in the principal nesting areas of the State are dry.

Breeding Population Indices -

Breeding pair counts were lower this spring then they were in 1953.

Production Indices -

The latest reports are somewhat more optimistic than they were a few weeks ago. It is now estimated that the waterfowl production will be little changed over that of one year ago. The following table shows the anticipated production compared to that of previous years:

Anticipated Washington Waterfowl Production

Region	1950	1951	1952	1953	Anticipated 1954
Western Washington	41,418	35,000	31,000	38,000	35,200
Central Washington	58,672	63,062	66,910	77,500	90,000
Eastern Washington	637,336	588,000	617,400	287,000	285,000
	737,426	686,062	715,310	402,500	410,200

Central Washington has improved slightly, while western Washington and the eastern part of the State are down slightly.

Conclusions -

Washington will produce approximately the same number of ducks as it did in 1953.

C A L I F O R N I A

Weather and Water Conditions -

The winter was relatively mild and spring migration out of California began in late February. Most of the pintails and geese had left the Valley by the middle of March or the first of April. For those that remained to nest, water conditions were not as favorable as they were last year.

Breeding Population Indices -

Aerial surveys on a basis comparable to the last several years, plus a ground count to supplement the aerial surveys in the Klamath Basin, were used to obtain the waterfowl population estimates presented in the following table:

Estimated Total Nesting Pairs-

Species	1950	1951	1952	1953	1954
Canada Goose	3,250	3,500	3,200	2,850	3,350
Mallard	38,843	40,543	51,580	40,380	34,330
Pintail	2,328	2,477	3,280	2,100	2,040
Gadwall	7,572	8,280	5,800	6,040	7,210
Cinnamon Teal	5,230	3,823	4,790	3,435	2,885
Redhead	5,540	5,763	3,380	3,760	3,785
Ruddy duck	3,581	5,323	1,510	1,950	2,365
Shoveller	1,197	934	1,120	925	705
Scaup	910	1,150	290	235	280
Others	1,181	820	610	545	395
Total Pairs (Ducks)	66,342	69,042	72,369	59,370	54,085
Total Pairs (Coot)	8,036	10,154	13,790	25,150	19,185

Production Indices -

Production surveys were not conducted.

Conclusions -

(1) An 18 percent increase in Canada geese was recorded last year. The increased number of breeding pairs is encouraging as it breaks the gradual decline that was recorded in past years. Band returns from the hunting season indicate that fewer resident geese were harvested last fall than in other years, which might have resulted in the increased number of breeders this spring.

(2) The breeding duck population showed a 9 percent decrease from last year. Practically all of this decrease can be attributed to the fewer number of mallards in the Sacramento Valley. Low production in this area last year may have been the contributing factor to this decline.

(3) The nesting Coot population shows a 24 percent decrease, which is the first time that Coots have failed to show a gain over the preceding year.

(4) It is estimated that the number of waterfowl produced in California this year will be about the same as last year or somewhat less.

U T A H

Weather and Water Conditions -

Unprecedented drought conditions in the winter, spring and early summer months of 1954 have produced conditions that will undoubtedly reduce the production of waterfowl in Utah. The spring run-off from winter snows was below normal in most of the State, reducing the storage of water in reservoirs and the spring flooding of many marsh areas. Heavy demands for spring irrigation water, plus limited spring rainfall, reduced most marsh areas of the State to permanent impoundments. Many areas that have formerly produced ducks were dry in the early spring.

Continued drought throughout the summer months may increase the mortality of broods that are produced. Canada Geese have not been affected, but young ducks appear to be suffering in some areas.

Breeding Population Indices -

The following table gives a summary of the results of the aerial survey in 1954.

Table I. Total Ducks Counted by Area and Square Mile as Determined from Aerial Surveys - 1953 and 1954.

Route	Sq. Mi. Sampled 1953	Sq. Mi. Sampled 1954	Total Ducks Counted 1953	Total Ducks Counted 1954	Ducks/Sq. Mi. 1953	Ducks/Sq. Mi. 1954
Box Elder Co.	48.0	48.0	2,946	2,752	64.5	57.3
Weber County	14.4	15.5	2,068	1,100	143.6	70.9
Davis County	14.2	14.2	386	330	27.2	23.2
Jordan River Clubs	6.2	6.2	670	809	108.0	130.5
Salt Lake Co.	6.7	6.7	101	36	15.0	5.4
Utah County	18.0	18.0	199	211	11.0	11.7
Sevier River	45.0	11.3	1,362	1,044	30.3	92.4
Total	167.0	119.9	7,861	6,282	47.0	52.4
Percent Change						↓ 11.5

Table II presents the data gathered during a ground survey of key waterfowl management areas:

Table II. Estimate of Total Breeding Pairs on State Refuges From Dike Line Census - 1953 and 1954.

Species	Ogden Bay 1953	Ogden Bay 1954	Farmington Bay 1953	Farmington Bay 1954	Pub. Shooting Grounds 1953	Pub. Shooting Grounds 1954
Canada Geese	114	120	62	75	21	12
Mallard	267	349	84	30	99	53
Gadwall	257	217	57	24	40	20
Pintail	215	218	63	24	31	10
Cinnamon Teal	712	747	303	190	121	105
Redhead	296	261	120	80	288	156
Shoveller	121	138	69	42	33	15
Green-winged Teal	2	6	--	--	--	--
Blue-winged Teal	6	30	5	4	2	2
Ruddy	30	70	20	23	2	4
Total	2,021	2,156	783	492	637	376

The decrease in the number of ducks counted in Box Elder, Weber, Davis and Salt Lake counties is the result of the drought conditions that existed in those areas this year. A large portion of the marshy areas in those counties that are normally wet were quite dry when the census was taken. This has caused the birds to concentrate around available water areas, which may not be in a flight transect, thereby causing a decrease in the number of birds observed on those flight lines.

The ground counts on key state waterfowl refuges of lone males, lone females and pairs indicate that there has been a decrease on these areas. Ogden Bay has had an increase in Mallard, Shoveller, Cinnamon Teal and Blue-Winged Teal. The Redheads have decreased in numbers over last year. The Farmington Bay Refuge and Public Shooting Grounds have had large drops in their breeding population which can be attributed to the construction work taking place during the nesting season on those areas.

Production Indices -

At the present time, indications are that the goose broods on Ogden Bay are about the same as in 1953. Goose broods on Farmington Bay have increased, while numbers of broods on the Public Shooting Grounds were down due to construction activity during the nesting season. Preliminary reports also indicate that there are fewer broods of redheads coming off the State refuges.

Conclusion -

In view of the drought conditions, it is estimated that somewhat fewer birds will be produced in Utah this year.

SASKATCHEWAN

(See Page 34)

Central Flyway Data

Waterfowl Kill Information

The following table presents the estimated kill of waterfowl during the 1952-53 and 1953-54 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

Species	Total Kill * 1952-53	1953-54	Percent Change
Mallard	2,009,345	1,336,410	- 33.5
Pintail	497,970	412,050	- 17.2
G-w. Teal	495,585	302,405	- 39.0
Scaup	222,775	172,310	- 22.6
Canvasback	187,430	140,570	- 25.0
Redhead	121,910	130,035	+ 6.7
Other Ducks	436,022	748,129	+ 71.6
Total Ducks	3,971,037	3,241,909	- 18.4
Canada Geese	72,500	69,210	- 4.5
Snow Geese	50,520	147,960	+192.9
Blue Geese	24,460	69,645	+184.7
White-fronts	20,970	33,680	+ 60.6
Total Geese	168,450	320,498	+ 90.3
Coot	73,260	87,133	+ 18.9

* Includes both retrieved and unretrieved birds.

Number of Hunters, Daily Kill, Seasonal Kill, and Average Times Hunted as Determined by the Waterfowl Hunter Mail Survey

		1952-53	1953-54	Percent Change
Number of Hunters				
Over 16		502,608	567,698	+ 12.9
Under 16		36,407	36,281	- .4
Average Daily Bag				
Over 16	Ducks	1.73	1.04	- 39.9
	Geese	.06	.10	+ 66.7
	Coot	.03	.02	- 33.3
Under 16	Ducks	.36	.48	+ 33.3
	Geese	.01	.04	+ 300.0
	Coot	.03	.06	+ 100.0
Average Seasonal Bag				
Over 16	Ducks	6.19	4.52	- 27.0
	Geese	.23	.45	+ 95.6
	Coot	.10	.10	-
Under 16	Ducks	1.28	2.11	+ 64.8
	Geese	.04	.19	+ 375.0
	Coot	.10	.27	+ 170.0
Average Times Hunted		3.58	4.35	+ 21.5

The kill of ducks decreased a fair amount (-18%) during the 1953-54 season as compared to the previous year, while the kill of geese increased considerably (+90%), and the kill of coot increased somewhat (+19%). In view of the fact that the length of season and bag limit in the Central Flyway remained the same during the past 2 years, it is of interest to note that the decrease in kill of ducks was due solely to a considerable decrease in the average daily bag (-40%). This lowered success was partially off-set by an increase of 13% in the number of hunters, and the fact that these hunters went afield 22% more times during the season. The daily bag of coot was less (-33%) as compared to the previous year, but this was more than made up for by the increased hunting effort. Increased hunting effort plus an increased daily bag combined to produce a considerable increase in the kill of geese.

Winter Trend Data - Central Flyway

Most of the CENTRAL FLYWAY experienced a dry, late fall with little snow or rain and with moderate temperatures. Just prior to and during the surveys a series of cold fronts developed, which brought snow and low temperatures as far south as New Mexico, Oklahoma, and parts of northern Texas. Further south along the coastal areas of Texas and Mexico, fog and overcast early in the period gave way to mild, clear-to-partly-cloudy weather. Everything considered, the weather was such as to hamper the survey by delaying many flights, but not such as to materially influence the estimates which were finally made.

Percent Change in Central Flyway (Continental) Populations Index Figures for Ducks, Geese, Swan and Coot from January 1953 to January 1954

(Comparable Coverage)

Area	Ducks	Geese	Swan	Coot	Total
Central Flyway States	+17.5	+46.7	- 2.2	+245.1	+ 23.3
Mexico, East Coast	+14.0	-63.1	-	+140.0	+ 49.0
Mexico, Central	+34.5	+11.3	-	- 50.3	+ 23.1
Total	+18.0	+41.2	- 2.2	+129.9	+ 29.6

Species Composition - Central Flyway (Continental) 1953-54 Based on Number of Birds Observed

(Comparable Coverage)

Species	Percent of Birds Identified 1953	1954	Percent Change 1953-1954
Pintail	21.3	23.3	+ 46.0
Mallard	26.9	21.7	+ 7.2
Coot	9.3	16.1	+ 29.9
Redhead	12.8	11.2	+ 15.8
Scaup	10.4	7.8	+ .9
Snow Goose	5.2	5.4	+ 38.7
Baldpate	2.2	3.4	+ 7.0
Canada Goose	2.0	2.3	+ 52.7
Cinn. & B-w. Teal	2.5	1.7	- 9.2
G-w. Teal	1.3	1.4	+ 45.5
Gadwall	1.5	1.2	+ 10.8
Shoveler	1.2	1.2	+ 24.7
Merganser	1.1	.8	+ 3.2
Blue Goose	.1	.7	+ 549.4
Canvasback	.5	.6	+ 70.5
White-fronted Goose	1.0	.4	- 46.3
Tree Duck	.2	.3	+ 96.4
Goldeneye	.2	.2	+ 4.4
Ruddy Duck	.2	.2	+ 20.0
Ring-necked duck	tr.	.1	+ 134.2
Mottled duck	.1	tr.	-
Bufflehead	tr.	tr.	-
Wood Duck	tr.	tr.	-
Trumpeter Swan	tr.	tr.	-
Whistling Swan	tr.	tr.	-
Black Duck	tr.	tr.	-
Total	100.0	100.0	

Summary of Central Flyway Waterfowl Indices

Waterfowl - The population index has shown no consistent trend up or down in the Central Flyway for the years 1950 through 1954. The 1954 index was 22 percent above the 5-year average and compared to individual years is:

27 percent above 1953
14 percent above 1952
52 percent above 1951
29 percent above 1950

Ducks - The 1954 duck index is 15 percent above the average for the 5-year period 1950-54 and compared to individual years is:

15 percent above 1953
7 percent above 1952
37 percent above 1951
24 percent above 1950

Among the ducks, the indices were:

1. About the same for mallard, scaup, baldpate, blue-winged teal, merganser and goldeneye.
2. Noticeably up for: pintail, green-winged teal, Shoveler, canvasback and ringneck.

Geese - The population index for geese for 1954 is 22 percent above the average for the past 5 years and compared to individual years is:

41 percent above 1953
76 percent above 1952
43 percent above 1951
10 percent below 1950

Compared to 1953 the snows, blues, and Canadas increased noticeably and the white-fronted geese decreased.

Coot - The coot index for 1954 is 70 percent above the 5-year average and compared to individual years is:

129 percent above 1953
30 percent above 1952
246 percent above 1951
127 percent above 1950

SASKATCHEWAN

Weather and Water Conditions -

Weather during May was unusually cold, causing the nesting season to be at least two weeks late. Surface water conditions at the start of the breeding season were satisfactory in the Parklands, but only fair in the Grasslands. However, periodic rains, starting in mid-May, halted the drying trend in the Grasslands, and literally soaked the Parklands.

The rains have continued all summer. At the present writing, virtually all weather stations report summer rainfall equal to or above normal. In some sections, particularly between Regina and the Manitoba border, rainfall was excessive. At the present time, the cumulative rainfall at some points in this region is 200 to 300% of normal. The rain came as periodic deluges and extensive flooding followed each downpour. This flooding probably destroyed some duck nests along pond borders.

In general, present surfact water conditions in southern Saskatchewan are now adequate for any late broods that may materialize.

Breeding Populaton Indices -

This year's breeding Population Index stands at 4-1/2 million ducks, or 39.8 ducks per square mile. This population is just about as large as our 1953 population, and is almost identical in species composition with a few exceptions. The all-important mallard and pintail hold the same predominant positions they occupied last year. The bluewing teal is up from 1953, and the canvasback is down. The data are presented in Table I.

Production Indices -

Table II presents the results of the July production survey:

Table I -
Breeding Population Indices - Southern Saskatchewan

Species	Average Index 1949 to 1953	1953 Index	1954 Index	Percent of Change 1954 Index From Av. (a)	1953 (b)
Pintail	923,925	1,335,000	1,254,100	+ 35.7	- 6.1
Mallard	1,186,400	1,958,300	1,915,200	+ 61.4	- 2.2
Baldpate	183,075	184,800	178,500	- 2.5	- 3.4
Shoveler	200,650	255,100	267,700	+ 33.4	+ 4.9
Gadwall	79,075	76,900	84,600	+ 7.0	+ 10.0
B-w. Teal	161,750	133,400	256,900	+ 58.8	+ 92.5
G-w. Teal	22,400	21,200	19,500	- 13.0	- 8.0
Total Puddlers	2,757,275	3,964,700	3,976,500	+ 44.2	+ .3
Scaup	146,250	208,800	215,500	+ 47.4	+ 3.2
Canvasback	123,150	253,200	150,400	+ 22.1	- 40.6
Redhead	38,300	84,800	67,200	+ 75.4	- 20.8
Ringneck	8,650	400	5,500	- 36.4	+1275.0
Ruddy	21,475	17,500	13,500	- 37.1	- 22.9
Goldeneye	8,700	600	7,900	- 9.2	+1216.6
Bufflehead	10,725	8,700	4,100	- 61.8	- 52.9
Scoter	45,975	47,100	98,600	+114.5	+109.3
Total Divers	403,225	621,100	562,700	+ 39.5	- 9.4
TOTAL DUCKS	3,160,500	4,585,800	4,539,200	+ 43.6	- 1.0
Coot	87,500	151,700	130,000	+ 48.6	- 14.3

Table II - Waterfowl Breeding Ground Conditions in July - South Saskatchewan

Strata	July 1953			July 1954		
	Broods	Potential Broods	Ponds	Broods	Potential Broods	Ponds
"A" - East Parklands, SE	8,180	84,680	748,980	9,200	64,240	1,230,800
"A" - West Grasslands	46,650	122,300	812,810	37,450	62,460	336,790
"B" Parklands, N & W	107,120	74,600	889,150	43,450	66,170	1,117,120
"C" Shortgrass	21,690	19,420	100,480	8,180	9,500	73,380
Provincial Totals	183,630	300,990	2,551,420	98,280	202,370	2,818,090

The 1954 Brood Index is alightly under 100,000, which is the smallest Brood Index recorded since 1950. At first glance, it seems very low, especially in view of the 1954 May breeding population Index of almost 5 million birds.

However, the 1954 nesting season got off to a very late start, and is still in full swing particularly in the Parklands. This could be one of those years when the rearing season for broods will run into early October.

The brood data suggest that the Grasslands are producing only a fair duck crop this season. The pintail didn't do so well on its first nesting attempt and its renesting seems to have lacked vigor. The mallard had somewhat bettwe luck in the Grasslands, but most broods of these two species were found in the hilly grazing lands. Apparently the stubblefield nesters in the agricultural sections lost their annual race with the plow.

The 1954 "Potential Later Broods" Index is slightly over 200,000, This suggests that Saskatchewan will have a good late hatch, not so strong as last year (1953 Late Brood Index was 300,000), but much more substantial than the late hatches of 1951 or 52. (See Table II)

Saskatchewan broods this year have fewer ducklings than usual. The average number of ducklings per nearly-mature (Class III) broods is only 4.8. The Class II broods in our air records averaged 6.0 ducklings, while Class I's averaged 6.9 ducklings per brood.

The 1954 season is very much retarded, and it is still too early to predict with certainty the outcome of the hatch. In this connection, an intensive study conducted in the vicinity of Redvers in the southeastern Parkland habitat type indicates that the chance for a substantial late hatch is practically nil. Nest predation has been very high throughout the season, and is continuing at a high rate. However, it is difficult to say how much of the parkland type the Redvers study typifies.

Conclusions -

There will be a noticable reduction in the size of the fall flight from all strata in southern Saskatchewan this year.

NORTH DAKOTA

Weather and Water Conditions -

Drought conditions existed during the early spring when waterfowl moved into the State, and it is reasonable to assume that this factor influenced the number of ducks which remained to breed. The small temporary water areas which are considered to play such an essential part during the period of waterfowl courtship and establishment of territory were almost entirely absent.

Very shortly after the breeding population became established, North Dakota received an abundance of moisture. Beginning in late May and continuing intermittently throughout June, heavy rains restored depleted water areas to their normal level, and in many instances low meadows adjacent to water areas were temporarily flooded.

The month of July has largely been one of drought. By the middle of this month water areas were dropping noticeably. If conditions should continue as at present the majority of the potholes which normally dry up in late summer will disappear at approximately the usual time.

Water information gathered during the May aerial breeding population survey is as follows:

Index to Total Water Areas in State

Average Index 1950 - 1953	509,293
1953 Index	429,643
1954 Index	239,874
Percent Change from 1953	- 44.2
Percent Change from Average	- 52.9

Breeding Population Indices -

The data collected during the aerial and ground breeding population survey are presented in Table I. These data show approximately a 35 to 40 percent decrease in breeding population from that of recent years. The indicated reduction may be somewhat greater than that which actually occurred since the entire inventory was conducted during a period of heavy winds. It is certain, however, that a significant decrease has occurred in the North Dakota breeding waterfowl population in 1954.

Table I - Summary of the 1954 Breeding Waterfowl Survey Compared with Previous Years

Species	Average Index 1948 to 1953	1953 Index	% Lone Males	1954 Index	% Lone Males	Percent of Change 1954 Index from Av. (a)	Percent of Change 1954 Index from 1953 (b)
Mallard	195,496	202,739	48.8	152,542	59.3	- 22.0	- 24.7
Pintail	392,588	268,564	61.6	186,788	69.1	- 52.4	- 30.5
B-w. Teal	473,874	555,851	20.0	275,666	22.3	- 41.9	- 50.4
G-w. Teal	(2) 5,276	3,218	-	7,064	23.5	+ 33.9	+119.5
Gadwall	88,753	120,093	11.6	73,946	11.8	- 16.7	- 38.4
Baldpate	28,101	31,888	16.9	27,182	21.5	- 3.3	- 14.8
Shoveler	152,365	114,973	21.9	73,410	47.1	- 51.8	- 36.2
Total Puddlers	1,331,177	1,297,326	34.5	796,598	44.7	- 40.2	- 38.6
Redhead	40,497	40,372	12.3	42,919	30.6	+ 6.0	+ 6.3
Canvasback	30,877	31,303	29.0	15,737	44.2	- 49.0	- 49.7
Scaup	40,887	77,234	48.6	25,126	52.2	- 38.5	- 67.5
Ruddy	21,355	13,604	23.1	12,697	34.4	- 40.5	- 6.7
Total Divers	133,616	162,513	34.7	97,641	39.3	- 26.9	- 39.9
Total Ducks	1,464,793	1,459,839	34.6	894,239	44.1	- 38.9	- 38.7
Coot	945	533	-	518	-	- 45.1	- 2.8

Production Indices -

It is too early to determine the result of this year's breeding activities but indications are that the production will be moderate at best.

The first waterfowl broods, primarily mallard and pintail, were noted during the last week of May. Early broods were very small in number but brood size is now considered to be quite favorable. Blue-winged teal broods were becoming common about the middle of July.

The information available at the present time indicates that the peak of the waterfowl hatch will occur about mid-August which is three to four weeks later than normal.

Conclusions -

It is estimated that waterfowl production in North Dakota will be somewhat less than last year.

SOUTH DAKOTA

Weather and Water Conditions -

The density of water areas at the start of the waterfowl breeding season in South Dakota has built up over the past three years to a peak of 7.23 water areas per square mile in 1953. During the past winter snowfall was light, especially in the western part of the State. Rainfall during the early spring failed to bring water levels to their previous point, and as a result there were only 4.64 water areas per square mile at the start of the breeding season. This represents a decrease of 36 percent below the 1953 density and is 22 percent below the 1950-53, 4-year average of 5.93 water areas per square mile.

This reduction in water areas was general over the State but was most severe in Missouri Hills (56%) and James River Valley (50%). The Missouri Plateau suffered moderately (32%) and the Minnesota Valley and Prairie Hills were affected the least (10% and 22%, respectively).

Rainfall between the time of the breeding population survey in mid-May and the brood survey in mid-July was not sufficient to check

the rapidly dropping water levels. At the time of the mid-July brood survey there were 40 percent fewer water areas (other than streams) east of the Missouri River than there was at the same time in 1953. This reduction in mid-July water area density was general over the eastern part of the State, averaging 47 percent in the Minnesota Valley, 34 percent in the Prairie Hills, 46 percent in the James River Valley, and 33 percent in the Missouri Hills.

Breeding Population Indices -

The decrease in water levels was accompanied by a 21 percent decrease in the breeding waterfowl population. The minimum State-wide duck density was estimated to be 10.85 ducks per square mile, compared with 13.72 per square mile in 1953. The current duck density is about the same (4% greater) as the 1950-1953, 4-year average density of 10.40 birds per square mile and represents a minimum population of 811,000 ducks. Coots decreased in abundance about 42 percent below their 1953 level. (Table I.)

Production Indices -

Despite the reductions in breeding populations and water levels, the east-river brood survey in mid-July indicated a duck brood density comparable to that of mid-July in 1953. An average of 0.65 broods per square mile was observed in the east-river country which is 8 percent below the 0.71 brood per square mile density in 1953. The distribution of broods, however, was considerably different than in 1953. The extreme eastern part of the State had a considerably higher brood density, especially in the north. In the Prairie Hills the density was 39 percent above that of 1953. The western portion of the east-river country contained substantially fewer broods than 1953, averaging 60 percent less in the Missouri Hills and 36 percent less in the James River Valley.

Table II - Indices to Duck Brood and Water Area Densities in mid-July, 1954 and 1953-1954 Trends

Physiographic Division	Duck Broods Per Sq. Mi. 1953	1954	Percent Change	Water Areas* Per. Sq. Mi. 1953	1954	Percent Change
Minnesota Valley	0.00	0.33	+	3.33	1.78	- 47
Prairie Hills	1.04	1.45	+ 39	4.59	3.05	- 34
James R. Valley	0.72	0.46	- 36	3.81	2.07	- 46
Missouri Hills	0.48	0.19	- 60	2.57	1.71	- 33
East-River Total	0.71	0.65	- 8	3.72	2.23	- 40

* Total water areas excluding streams.

Table I - Physiographic Distribution of the Breeding Waterfowl Population and 1953-1954 Trends

Physiographic Division	Corrected * Ducks per Square Mile			Est. Minimum Population		Percent of State-wide Population		
	1953	1954	Change	1953	1954	1953	1954	Change
Minnesota Valley	10.58	12.37	+17%	13,000	15,000	1%	2%	+ 1%
Prairie Hills	26.22	22.34	-15%	212,000	181,000	21%	22%	+ 1%
James River Valley	22.19	20.58	- 7%	416,000	387,000	41%	47%	+ 6%
Missouri Hills	22.90	14.29	-38%	173,000	108,000	17%	13%	- 4%
Missouri Plateau	5.30	3.45	-35%	207,000	135,000	20%	16%	- 4%
State-wide**	13.65	10.85	-21%	1,021,000	826,000	100%	100%	0

* Corrected from ground transect data to compensate for unobserved females on nests. Corrected by 1.12 in 1953 and 1.22 in 1954.

** Based in 1954 on twice the number of ducks observed and twice the number of square miles of the reduced Missouri Plateau coverage.

CONCLUSIONS -

With the breeding population 21 percent below that of 1953, water conditions lower than they have been at any time during the 1950-53 period, and the number of broods observed during July being the same as or somewhat below the 1953 level, it is estimated that there will be fewer ducks move southward from South Dakota this fall.

WYOMING

Weather and Water Conditions -

Water conditions throughout central and eastern Wyoming at the commencement of the breeding season were sub-normal and run-off was below average. Up to the present little improvement has been noted. In recent weeks the mountainous northwestern section and portions of the stockpond area in northeastern Wyoming have received ample precipitation to maintain water levels. The remainder of the State, however, is experiencing drought conditions. Should this trend continue through the next few weeks, it may have a significant depressing effect upon waterfowl production.

An early warm spell this spring was followed by a period of unseasonably cold weather. As a result, nesting was delayed for both ducks and geese. First broods were observed later than usual, and the brood period will probably be prolonged over a relatively longer time.

Breeding Population Indices -

This year, Wyoming revised its State-wide breeding ground survey methods. Although the surveys this year yield more reliable data, there is little opportunity for making comparisons with previous years. For the record, however, the following are the data collected:

Duck Breeding Ground Survey - Wyoming, 1954*

	Eastern Wyoming	Western Wyoming***	Total
Square Miles in Sample	612	369	981
Total Square Miles of Waterfowl Habitat	32,832	22,122	54,954
Percent of Total Habitat Sampled	1.86	1.67	
Pairs Per Square Mile	.816 **	.791	
Total Pairs	26,690	17,500	44,190
Total Ducks Per Square Mile	2.34 **	2.90	
Total Ducks	76,826	64,155	140,981

* Excludes Yellowstone National Park, National Forests, and areas of known minor waterfowl use.

** Figures adjusted for ground conditions.

*** Includes Teton, Lincoln, Uinta, Sublette, Sweetwater, Park, Big Horn, Washakie, Hot Springs, Fremont Counties, and Western half of Natrona County.

It is the opinion of the biologists making the survey that a breeding population index of 140,981 is about average for Wyoming.

Production Indices - Production surveys were not conducted.

Conclusions -

In view of the drought conditions which exist in the State, it is estimated that fewer birds will be produced in Wyoming this year.

NEBRASKA

Weather and Water Conditions -

Weather conditions for the 1954 season have been unusual. Unseasonably warm weather prevailed in early spring causing two weeks or more advancement in the first breeding activity. Then, a severe freeze accompanied by a blizzard occurred in the sandhills the first of May. This was followed by relatively normal spring weather until early June. Very hot summer weather accompanied by many high winds has prevailed the remainder of June and up to mid-July.

While no trend data is available for sandhill water areas, observations show that water levels for the western sandhills are generally good. The shortage of rainfall for the past two years has reduced the number of potholes and other temporary type water areas somewhat from 1953 but those remaining have been available to breeding waterfowl throughout the season. The permanent lakes have maintained at least normal levels.

In the eastern sandhills meanwhile, little recovery was made in the number of temporary, rainfall controlled water areas from the 1953 dry-up. The 1954 dry-up has been severe since early spring even with normal rainfall in May and June. Only a very few of these areas have been available to breeding waterfowl.

The lakes of the eastern sandhills which are controlled by ground water, were at near-record levels at the beginning of the breeding season and have maintained at least normal levels until mid-July. The bulk of breeding and production has been confined to these areas.

Breeding Population Indices -

Although a systematic aerial sampling of the counties containing the major portion of the sandhill breeding ground was established this year, ground counts established in 1948 give the only trend information available.

Table I - Breeding Population Ground Counts

Routes and Dates	Computed Pairs*	Pairs per Sq. Mi.	Total Ducks	Ducks per Sq. Mile
Mid-May				
Western (A & B only)				
1954	318	12.5	639	25.2
1953		18.9		34.2
Change to 1954		- 34%		- 26%
Mid-June				
Western (A, B & D)				
1954	332	10.6	594	18.9
1953		12.1		18.5
Change to 1954		- 12%		+ 2%
1948-53 Average		16.7		30.6
Change to 1954		- 37%		- 38%
Change (A & B only)				
May to June, 1954		- 17%		- 31%
Eastern				
1954	23	4.9	33	7.0
1953		10.3		12.9
Change to 1954		- 52%		- 46%

* Assuming lone males to be territorial and to represent a pair.

It is apparent from the ground counts that the waterfowl breeding population of the sandhills is down from that of 1953. The major portion of this loss occurrs in the eastern area with the western loss being relatively insignificant. It is possible that these losses bear a direct relationship with the losses in available habitat.

Production Indices -

Table II presents the results of a brood survey in mid-July.

Table II - Sandhill Brood Counts - Ground - Mid-July

	Western Routes	Eastern Routes	Over-all Routes
Broods Observed	43	5	48
Total Ducklings	292	35	327
Sq. Miles Sampled	29.6	5.7	35.3
Broods Per Sq. Mile			
1954	1.5	0.9	1.4
1953	1.4	2.2	1.6
Change 1953 to 1954	+ 7 %	- 59 %	- 13 %
Average 1948 to 1953	2.2	3.2	2.4
Change, Average to 1954	- 32 %	- 72 %	- 33 %
Broods per pair			
1954	.13	.22	.14
1953			.07
Change, 1953 to 1954			+ 100 %
Average - 1948 to 1953			.12
Change, Average to 1954			+ 17 %

As the trends indicated in Table II, are based on one mid-July count for each year, the uniform brood appearance for this season undoubtedly makes the 1954 count high on a comparative basis. It is believed, however, that the production-breeding population ratios will be at least as good as those of 1953.

Conclusions -

It is estimated that the fall flight from Nebraska will be about the same as last year.

M O N T A N A

Weather and Water Conditions -

Spring run-off was light in the Flathead Valley and Great Falls Piedmont regions resulting in a reduction of potholes. Late snows in the central and eastern Hi-line were heavier than in the above regions and remained on the ground for an extended period. This precipitation resulted in a 107% increase in the number of potholes in the east and central Hi-line region.

Below zero temperatures and snow during early April resulted in some waterfowl mortality.

During themonths of May and June, precipitation and temperatures were near normal.

Breeding Population Indices -

Aerial census routes were again flown in order to establish the breeding population trend. Identical routes have been censused for the past six years. The results are presented in Table I.

Table I. Waterfowl populations as determined from aerial census routes

Physiographic Area	App. Size of Area	Birds/Sq. Mi. 1953	Birds/Sq. Mi. 1954	Population Est. 1953	Population Est. 1954
Sheridan County	1,440.	39.4	57.5	50,256	82,800
East Hi-line	7,920	5.2	7.1	41,184	56,232
Center Hi-line	9,468	11.5	15.6	108,882	147,700
Great Falls Piedmont	7,020	7.9	8.4	55,458	58,968
Total	25,848	9.9	13.4	255,780	345,700
Percent Change					+35.2

Trend areas flown in the area south of the Missouri River show the population to be approximately the same in 1954 as it was in 1953.

Production Indices -

Weather and water conditions have been excellent for production in the Hi-line area since the start of the nesting season. At this date, the average brood size is 1.2 ducklings larger than brood counts for a similar period during the previous year. The important species contributing to this brood count and the average size of their broods are as follows:

Mallard	5.7
Pintail	5.8
Baldpate	7.0
Shoveller	9.0
Blue-winged teal	9.3

Canada goose production in the Flathead Valley was reduced by approximately one-third from the 1953 production of 821 goslings.

Conclusions -

It is estimated that the fall flight of ducks from Montana this year will be considerably greater than in 1953.

C O L O R A D O

Weather and Water Conditions -

Climatological data indicate that Colorado is experiencing a very severe drouth this year. Information received from the Office of Irrigation Investigations reveals that, in general, snow pack in the high mountains of the State during the past winter was 50 to 60 percent of normal. The influence of this lack of stored moisture resulted in decreased water levels in reservoirs, and a very acute shortage of water for irrigation. In addition, a definite lack of local precipitation on the various breeding grounds during the winter and spring resulted in a few of the semi-permanent lakes and sloughs containing water this spring. A good many of the permanent areas were also dry for the first time in many years. All of these factors resulted in decreased waterfowl habitat in most parts of Colorado this year.

Breeding Population Indices -

A summary of the 1954 breeding-pair counts is compared in Table 1 with counts from previous years. Comparison between 1954 and 1953 counts from five areas shows that breeding-pair numbers were down 26 percent this year. However, it should be pointed out that counts from North Park and South Park were not complete comparable with similar counts in 1953. Eliminating these areas from the comparison results in a decrease of only 12 percent from 1953, and this is believed to be the best comparison between the two years.

Contrasting counts between 1954 and 1952 on these areas, shows a reduction of only one percent in 1954. Thus, it is believed that duck breeding pair number in 1954 were near normal, and not significantly different from what can usually be expected in this State despite the shortage of water.

The mallard made up 70 percent of the breeding population in the State with blue-winged teal, pintail and gadwall the next most important breeders.

Breeding pair counts of Canada geese in the Yampa Valley and Brown's Park also show some reduction in numbers between 1954 and the two previous years. This amounts to a 17 percent decrease in 1954 from both these years.

Production Indices -

Brood counts show the effect of the critical shortage of water throughout the State on production. Although some areas produced about the same number of birds as past years, total estimated State numbers are down about 19 percent from 1952, and almost 37 percent from 1953. (See Table I). These data do not include brood counts from the San Luis Valley which reportedly is suffering one of its worst drouths in history. This is substantiated by Biologist Fleetwood, Fish and Wildlife Service, which indicates that only 34 percent of the attempted nests successfully hatched.

Although no data are available for geese, it is believed that production for this species is somewhat less than 1953.

Conclusion -

It is estimated that there will be a considerable decrease in the fall flight of ducks from Colorado.

NORTHERN ALBERTA & NORTHWEST TERRITORIES

(See Page 15)

SOUTHERN ALBERTA

(See Page 17)

NORTHERN SASKATCHEWAN, NORTHERN MANITOBA, AND ONTARIO

(See Page 60)

Mississippi Flyway Data

Waterfowl Kill Information

The following table presents the estimated kill of waterfowl during the 1952-53 and 1953-54 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

Species	Total Kill * 1952-53	1953-54	Percent Change
Mallard	2,823,090	1,719,725	- 39.1
G-w. Teal	626,420	451,065	- 28.0
B-w. Teal	625,780	701,465	+ 12.1
Scaup	395,940	322,680	- 18.5
Black Duck	386,930	217,750	- 43.7
Pintail	308,380	225,485	- 26.9
Canvasback	256,235	114,235	- 55.4
Other Ducks	1,015,285	993,623	- 2.1
Total Ducks	6,438,060	4,746,028	- 26.3
Canada Goose	100,375	86,850	- 13.5
Snow Goose	27,070	25,875	- 4.4
Blue Goose	20,580	108,560	+427.5
Other Geese	11,760	15,435	+ 31.3
Total Geese	159,785	236,720	+ 48.2
Coot	866,960	741,481	- 14.5

*Includes both retrieved and unretrieved birds.

Number of Hunters, Daily Kill, Seasonal Kill, and Average Times Hunted, as Determined by the Waterfowl Hunter Mail Survey

		1952-53	1953-54	Percent Change
Number of Hunters				
Over 16		980,665	878,138	- 10.4
Under 16		75,556	51,668	- 31.6
Average Daily Bag				
Over 16	Ducks	1.15	1.00	- 13.0
	Geese	.03	.05	+ 66.7
	Coot	.16	.15	- 6.2
Under 16	Ducks	.32	.49	+ 53.1
	Geese	.01	.03	+200.0
	Coot	.08	.12	+ 50.0
Average Seasonal Bag				
Over 16	Ducks	5.02	4.21	- 16.1
	Geese	.12	.22	+ 83.3
	Coot	.70	.62	- 11.4
Under 16	Ducks	1.41	2.09	+ 48.2
	Geese	.02	.13	+550.0
	Coot	.34	.52	+ 52.9
Average Times Hunted		4.35	4.23	- 2.7

The kill of ducks decreased considerably (-26%) in the Mississippi Flyway during the 1953-54 season as compated to the previous year. A major increase occurred in the kill of geese (+48%), while the kill of coot decreased somewhat (-14%).

The number of adult hunters decreased slightly (-10%), and the average number of times hunted during the season remained about the same, which means that the total amount of hunting decreased somewhat. The decreased amount of hunting combined with a decrease in average daily bag accounts for the decreased kill of ducks and coot. A large increase in daily bag of geese was sufficient to overcome the decreased hunting effort and accounts for the increased kill of geese. In view of the fact that length of season and bag limits remained the same in the Mississippi Flyway, it seems apparent that either there were fewer ducks and coot present in the Flyway during the fall period, or the weather was such as to reduce the availability of the birds which were present.

Winter Trend Data - Mississippi Flyway

In the northern portion of the MISSISSIPPI FLYWAY, mild weather conditions in the fall and early winter retarded migration. Wide-spread drought reduced the number of water areas and made counts easier. Cold waves in December and during the survey period froze all but the larger lakes, streams, and spring holes, thus concentrating the birds or driving them south. In Arkansas, Tennessee, and Mississippi drought conditions prevailed and the restricted waterfowl were distributed largely on reservoirs, lakes, and streams where they were easier to count than during those years when the river bottoms were flooded. It should be noted that the bottoms were both flooded and frozen during the January 1951 survey, a conditions which forced the birds into the open. They were flooded but not frozen in January 1952, a condition which made the birds difficult to count. In 1953, and also this year, the bottoms were not flooded and the birds were easier to count. The importance of these changes in conditions as they affect the waterfowl trend figures are difficult to evaluate but should be kept in mind when analyzing the data.

Percent Change in Mississippi Flyway (Continental) Population Index Figures for Ducks, Geese, Swan and Coot from January 1953 to 1954

Area	Ducks	Geese	Swan	Coot	Total
Ontario	- 12.8	-	-	+ 6.2	- 13.9
Mississippi Flyway States	+ 3.4	+ 18.2	+95.9	+22.3	+ 5.4
Total	+ 3.0	+ 18.2	+95.9	+22.3	+ 5.0

Species Composition - Mississippi Flyway (Continental) 1953 and 1954

Species	Percent of Birds Identified 1953	1954	Percent Change 1953-1954
Mallard	58.3	60.2	+ 7.3
Pintail	4.5	7.8	+ 78.8
Blue Goose	6.5	7.7	+ 24.0
Canada Goose	4.3	4.3	+ 4.1
G-w. Teal	6.2	3.6	- 41.3
Black Duck	3.2	2.9	- 6.5
Scaup	3.9	2.9	- 26.1
Coot	1.7	2.0	+ 21.9
Gadwall	3.1	1.6	- 46.1
Canvasback	2.0	1.5	- 27.1
Wood Duck	1.6	1.0	- 34.2
Merganser	.6	1.0	+ 66.9
Ringneck	1.2	.9	- 19.1
Snow Goose	.4	.7	+ 71.6
Goldeneye	.8	.6	- 16.5
Ruddy Duck	.2	.5	+ 52.0
Baldpate	.8	.4	- 46.2
Shoveler	tr.	.3	+ +
Redhead	.4	.1	- 60.0
White-fronted Goose	.1	tr.	-
Cinn. & B-w. Teal	.1	tr.	-
Bufflehead	tr.	tr.	-
Whistling Swan	tr.	tr.	-
Scoter & Eider	tr.	-	-
Old Squaw	.1	-	-
Total	100.0	100.0	+ 5.0

Summary of Mississippi Flyway Waterfowl Indices

Waterfowl - The 1954 waterfowl index is 15 percent above the 5-year average level and compared to individual years is:

5 percent above 1953
28 percent above 1952
3 percent below 1951
72 percent above 1950

Ducks - This year the index is 17 percent above the average for the past 5 years and compared to individual years is:

3 percent above 1953
36 percent above 1952
4 percent below 1951
90 percent above 1950

Among the ducks, the indices were:

1. About the same for: mallard and black duck.

2. Noticeably up for: pintail, merganser and ruddy.

3. Noticeably down for: green-winged teal, scaup, gadwall, canvasback, wood duck, baldpate and redhead.

Geese - The goose index is 21 percent above the average for the past 5 years and compared to individual years is:

18 percent above 1953
40 percent above 1952
25 percent above 1951
30 percent above 1950

Among the species, the Canadas remained about the same as last year while the blue and snow geese increased noticeably.

Coot - The coot index in the Mississippi Flyway is 44 percent below the average for the past 5 years and compared to individual years is:

22 percent above 1953
70 percent below 1952
51 percent below 1951
42 percent below 1950

Breeding Ground Surveys

SOUTHERN MANITOBA

Weather and Water Conditions -

The spring break-up was slow and snows with freezing temperatures in late April and early May retarded the start of nesting. May and early June were generally cool and wet. Rains in late May and early June maintained, and in some cases raised water levels. July has been more nearly a normal month, precipitation occurring mainly in the form of local showers. However, water levels are still extremely high, potholes generally being flooded into the shoreline vegetation or into grain fields.

Table I shows the aerial pond count for Stratum "A" as compared to previous years and to the May count.

Table I - Ponds in STRATUM "A" - Manitoba

Date	Index	Ponds per Square Mile
July - 1952*	125,971	12.2
July - 1953*	150,854	14.6
July - 1954	472,362	45.6
May - 1954	258,200	24.9

*Figures for 1952 & 1953 were taken from the July 1953 report and adjusted as indicated above for the different width of strip.

Breeding Population Indices -

The results of the May aerial survey are presented in Table II.

Table II - Waterfowl Population Indices - Southern Manitoba

Year	Stratum "A"	Stratum "B"	Total
1951	472,800	165,900*	638,700*
1952	343,200	143,300*	486,500*
1953	209,400	117,300*	326,700*
1954	361,900	165,900*	527,800*
1953	209,400	151,600	361,000
1954	361,900	242,800	604,700
Percent Change 1953-1954	+ 73	+ 60	+ 65

* Data uncorrected for absent hens in these cases.

Among species, canvasback and shoveler showed the greatest proportional increase, while gadwall remained the same. Most other species increased moderately.

Ground transects in southwestern Manitoba by Game Branch personnel indicated a reduction in breeding population (1,661 birds on transect in 1953; and 936 present in 1954). Intensive ground studies in District 8 and near Roseneath both indicated that the 1954 breeding population was about equal to 1953.

Production Indices -

Table III shows the brood index for 1954 as compared to previous years. As was pointed out by A. S. Hawkins in last year's July report, there is considerable difficulty in comparing brood indices for late years, when only a small percentage of the hatch has materialized, with early years, when most of the broods have hatched at the time of the survey. Thus the 1953 and 1954 data on broods alone may only indicate the lateness of those seasons. However, potential later broods are a great aid, even now in determining prospects.

Table III - Aerial Brood Index - Stratum "A", Manitoba - 1950-1954

Year	Brood Index	Index to Pot. Later Broods	Coot Brood Index	Index to Pot. Later Coot Broods
1950	19,708	No data	no data	no data
1951	33,178	No data	no data	no data
1952	32,141	No data	no data	no data
1953	7,976*	23,022	584	0
1954	13,026	37,858	2,818	5,104

* Made comparable to 1954 data by counting lone hens in the "potential later brood" column, rather than in the "brood" column. The published 1953 index was 8,502 broods. In 1954 broods were tallied only if young were seen.

The maturity of those broods so far hatched as shown in Table IV indicates that we are still at the beginning of the brood season. In 1953, the survey apparently came at a phenologically later date.

Table IV - Age Class Distribution of Broods - Stratum "A", Manitoba

Year	No. Broods Aged	Class I	Class II	Class III
1953	150	22.0%	43.3 %	34.7 %
1954	200	61.5%	33.5 %	5.0 %

The aerial data indicate that more birds will be produced in 1954 than were produced in 1953. On the other hand, intensive ground studies

in District 8 and near Roseneath, both of which are in Stratum "A", indicate that production is likely to be less than last year as far as ducks are concerned. An increase is indicated for coot.

Conclusions -

In view of the conflicting evidence concerning production of young, it is estimated that the fall flight of ducks from southern Manitoba will be about the same as last year. It is estimated that the flight of coot will increase.

NORTHERN SASKATCHEWAN, NORTHERN MANITOBA, AND ONTARIO

Weather and Water Conditions -

This spring was the most retarded of any during the past five years. Almost all lakes were still completely ice covered on Myay 11. Cadam Bay at the south end of Lake Manitoba was not ice free until May 17, whereas, last year the ice went out on May 4. About two feet of snow was still present in the bush in the county east of Kenora. Apparently the season was late over the entire country, but it was most retarded in that area between Kenora and Armstrong Station. The only water available to waterfowl was at the mouths of fast streams emptying into lakes. Whether or not the late season retarded waterfowl nesting is questionable. From Kenora to Armstrong Station 32 percent of the mallards recorded were lone drakes, indicating at least that some nesting was in progress.

The weather for the most part was cold and cloudy, and lakes did not start to open up until about May 20. Even then lakes in the northern portion of the provinces remained frozen, and during late May and the early part of June the larger lakes, such as Atikameg, Reindeer Lake, Woolaston Lake, Black Lake, and Lake Athabasca, were still ice covered.

The late nesting season was further hampered by very extensive, frequent and prolonged rains which are conducive to high egg and juvenile mortality. River deltas which are the highest duck producing areas in the north (such as the Athabasca and Saskatchewan River Deltas) have been extensively and severly flooded and as a result waterfowl nesting (especially scaup) has been seriously disrupted. Even in the precambrian area which is usually immune to flooding, there are many of the better waterfowl breeding areas (such as Pukatawagan) which show the result of too much rain.

Breeding Population Indices -

A total duck index for each stratum was computed on data collected during the survey, and these are presented in Tables II through VII. All data have been corrected for hens on nests.

Table I. Duck Index for Entire Area Surveyed

Stratum	INDEX 1953	INDEX 1954	Change Percent
C Ontario	711,525	436,435	- 38.7
C Manitoba	344,913	206,271	- 40.2
D Manitoba	100,588	74,050	- 26.5
D Saskatchewan	406,819	324,788	- 20.2
E Saskatchewan	63,428	65,934	+ 3.9
Total	1,627,273	1,107,478	- 31.9

Table II. Species Composition of Breeding Population

Species	Stratum C-Ontario	C-Manitoba	D-Manitoba	C-Saskatchewan	E-Saskatchewan
Mallard	12.2	23.5	17.2	20.6	21.1
Black	18.0	.2	-	-	-
Baldpate	1.9	4.0	2.7	1.2	.3
Pintail	.9	.6	4.0	2.7	-
G. W. Teal	.7	-	Tr	.5	-
B. W. Teal			1.5	1.5	.5
Shoveler			1.2	.4	
Merganser	28.2	20.3	1.1	6.9	10.9
Redhead			2.6	.8	1.6
Ringneck	4.3	2.0	2.7	1.7	2.7
Canvasback			21.2	2.4	2.7
Scaup	10.2	17.5	33.5	24.9	23.8
Goldeneye	8.9	.7	.6	.2	
Ruddy			.2	.6	
Bufflehead	.1	.9	.2	3.6	4.4
Scoter	.4	2.7	2.5	4.2	13.4
Unidentified	14.9	27.6	24.7	27.8	18.6

Stratum C in Ontario shows a decrease of 38.7 percent from 1953. The 1953 figures, however, were 62 percent above those of 1952. Large decreases were recorded for mallards, mergansers, and ring-necked ducks. Black ducks increased sharply and scaups showed a slight increase. The increase in black ducks was probably due to the additional sampling in eastern Ontario.

A substantial decrease (40%) was also recorded for Stratum C in Manitoba. All species but the baldpate showed a decrease, but the most important decreases were in the mallard, scaup, and ring-necked ducks. A decrease of 66 percent was recorded for the mallard.

The Saskatchewan River delta (Stratum D), which has the highest breeding density of any area covered in this survey, had a population decrease of 26 percent. All species of ducks, except the ring-neck and scoter, decreased in numbers from 1953. The most important decreases were, again, in the mallard and scaup.

In Stratum C Saskatchewan a 20 percent decrease in total duck numbers from 1953 was indicated. Again, mallard and scaup showed an important decrease. The only species which increased were the redhead and ring-necked duck.

For Stratum E Saskatchewan a slight increase, probably not significant, was recorded. Mallard, however, decreased 20 percent. The ring-necked duck showed a small increase.

Combining all the strata together and considering the area surveyed as a whole (472,118 sq. mi.) it appears that the total duck population decreased approximately 30 percent.

Production Indices -

Production surveys were conducted in much of this area for the first time this year. Therefore, data for the purpose of making comparisons with last year are lacking. However, in view of the spring survey data, the retarded nesting season, and the frequent and excessive rains during the month of June, there is no reason to believe that the production of ducks will come up to average in the north this year. Undoubtedly, many ducks will yet hatch off, even into August, but it is unlikely that the bumper crops of ducks of the past few years will materialize this summer.

Conclusions -

There will be a noticable decrease in the flight of ducks from northern Saskatchewan, northern Manitoba, and Ontario this year.

MINNESOTA

Weather and Water Conditions - February and early March were mild, except for a snow storm on March 12 and 13, and the most spectacular spring migration in many years occurred in southwestern Minnesota. Between April 30 and May 10, however, the weather was very bad with snowfall and blizzard conditions. In the Ely area, the snowfall was the heaviest in 40 years. Fifteen to 25 inches of snowfall was recorded in Koochiching County, and 11 inches in Beltrami County. Since it is believed that nesting was underway at the time of the storm, it is likely that there was considerable nest loss as a result.

The late spring snow caused high water during the early part of the nesting period, and this was followed by continuing heavy rains through May and June in various parts of the State. On May 23, 2.0 inches of rain fell in the Albert Lea area; on May 30, 3.04 inches fell around Brainerd; on June 7, 2.24 inches at Fergus Falls; 1.0 inches at Thief River Falls on June 11, and during the period June 14-16, high winds and rain were general in westcentral and northwestern Minnesota. Again on June 18, 19, and 20, rains were general in the State with flooding of pastures and croplands. The index to water areas obtained during the breeding pair survey in May indicated that there were 13% more water areas present than in 1953, and 44% more than the average index for 1949-1953.

Breeding Population Indices - A total of 466.5 square miles was sampled by ground transect method. The sample was distributed throughout a 43,125 square mile area, including all prairie portions of the State and a fringe of the northwest wooded portions. The following table presents the information collected.

Indices to Total Breeding Pairs

Species	Average Index 1949 to 1953	1953 Index	% Lone	1954 Index	% Lone	Percent Change of 1954 Index Av. (a)	Percent Change of 1954 Index 1953 (b)
Mallard	19,147	18,543	53.9	19,094	62.4	- 21	- 19
Pintail	4,830	5,606	46.0	4,744	78.4	- 2	- 15
B-w. Teal	47,006	54,769	18.9	40,538	28.5	- 14	- 26
G-w. Teal	302	431	-	1,725	83.3	+471	+300
Gadwall	690	863	57.4	4,744	42.9	+588	+450
Baldpate	1,617	2,156	20.0	2,588	39.3	+ 60	+ 20
Shoveler	2,933	3,019	48.5	5,175	51.8	+ 76	+ 71
Black Duck	103	-	-	-	-	-	-
Wood Duck	449	431	20.0	863	57.1	+ 92	+100
Total Puddlers	77,077	85,818	29.6	75,471	42.8	- 2	- 12
Redhead	3,530	3,850	7.7	3,881	25.0	+ 10	+ 0.8
Canvasback	129	431	14.3	431	50.0	+234	same
Scaup	3,709	2,588	15.4	4,744	38.5	+ 28	+ 83
Ringneck	9,229	9,488	28.4	8,194	19.5	- 11	- 14
Ruddy Duck	1,553	431	71.4	1,725	52.9	+ 11	+300
Goldeneye	552	431	20.0	1,294	33.3	+134	+200
Total Divers	18,702	16,819	24.0	20,269	29.4	+ 8.3	+ 21
Total Ducks	95,779	102,637	28.7	95,740	39.9	- 0.04	- 7
Coot	40,793	48,731		89,269		+119	+ 83

An intensive ground survey in the Chippewa National Forest revealed an estimated breeding population of 1,452 birds. This was 15 percent greater than in 1953, but 23.1 percent below the average for the period 1939 through 1953.

Production Indices

Brood counts were made on 55 water areas and pothole transect routes in the period of May 23 to July 2. The brood counts were made in all parts of the State. The most notable feature of the counts was the scarcity of broods in all parts of the State. A total of 137 broods were seen in all.

Thirty of the brood count areas had been censused both in 1952 and 1953. On these areas, only 60 broods were recorded this year compared with 132 in 1953 and 231 in 1952. This year's data are not strictly comparable with the 1952 and 1953 counts since some of the counts were made as much as ten days earlier than in these years. However, the figures illustrate the relative scarcity of broods. An unusually large number of paired adults were recorded on the counts. The number was 235 on the 30 areas.

Most of the broods (62.8%) were of Class I age. It is probable that the counts were made while the main hatch of the spring was coming off.

Average brood sizes were quite large. The over-all average brood size was 7.5 compared with 7.2 in 1953 and 7.4 in 1952. Brood sizes ran large for mallards, blue-winged teal and ringnecks which are the principal breeding ducks of the State. Most mallard broods were in the Class I and Class II age group. The absence of mallards and other ducks in the Class II I groups indicates that early nests may have been destroyed by the snowstorm in May. Nearly all blue-winged teal and ringneck broods were Class I, indicating that hatching was in progress for these species when the counts were made. On the other hand, broods observed during an intensive survey in the Chippewa National Forest between June 24 and July 12 were predominately Class III with only a few Class I's. The adult-Juvenile ratio was 1:2.9, which is considerably better than 1953, and is 8.2 percent better than the average for the period 1937 through 1953.

Conclusions -

Breeding pair studies indicated that Minnesota started out with at least a normal breeding waterfowl population.

Weather conditions (a snowstorm) in May were such as would delay nesting and would cause some loss of early nests.

Weather conditions in June were in general favorable for nesting except for a windstorm in westcentral and northwest counties and flooding in southern Minnesota.

Brood counts indicate that the hatch was late in coming off.

Average brood sizes were large for the main breeding species of the State.

Water conditions at present are favorable for a late hatch. Although the success of the late hatch is difficult to predict, it is estimated that it will be good and that Minnesota will produce an average crop of waterfowl this year.

MISSOURI

Weather and Water Conditions - No data submitted.

Breeding Population Indices -

For several years, ground surveys of sample areas have been conducted throughout Missouri. Surveys this year were conducted between May 10 and June 10. In 1953, 4,976 acres of lake and marsh and 371 miles of stream were censused, while in 1954, 4,931 acres and 581 miles of stream were censused. The data from these surveys are as follows:

	1953	1954	Percent Change
Birds Per Sq. Mile of Lake and Marsh			
Wood Duck	5.8	4.4	- 24.0
Mallard & B-w. Teal	4.7	2.8	- 40.4
Birds per Lineal Mile of Stream			
Wood Duck	.24	.22	- 8.0
Mallard & B-w. Teal	.19	.13	- 31.6

Production Indices -

Brood observations made during the surveys mentioned above were as follows:

	1953	1954	Percent Change
Total Wood Duck Broods	42	31	- 26.0
Average Brood Size	4.8	6.2	+ 22.0
Total Mallard & B-w. Teal Broods Observed	3	4	+ 33.3
Average Brood Size	4.3	8.5	+ 97.5

Conclusions -

Based on the number of nesting attempts observed per square mile of lake and marsh, and per mile of stream, a downward trend has been recorded. In view of this trend, it is estimated that Missouri will produce somewhat fewer ducks than a year ago.

IOWA

Water and Weather Conditions -

Iowa experienced extremely warm weather in early April and unusually cold, freezing weather in early May.

Breeding Population Indices -

Special emphasis has been placed upon the study of the wood duck because it has again become an important nester during the last fifteen years, and Iowa's contribution to the over-all production of this species is important within the flyway. This State is reputed to contain from 11,000 to 16,000 miles of stream and rough estimates from stream surveys indicated about one pair of wood ducks to every two to four miles of good stream habitat in 1953. In 1954 both stream survey data and wood duck nesting boc checks indicated reduced breeding populations of wood ducks within the State.

Wood Duck Stream Survey Data

Survey Route Number and Miles Censused	Wood Ducks Counted M[1]	F[2]	Prs.[3]	Unid.[4]	Total	Date of Census
1. 8 Miles				4	4	May 9, 1953
"	1	1			2	May 11, 1954
2. 7 Miles						
Route abandoned in 1954 because stream channel straightened.						
3. 7 Miles route established in 1954						
	1	0	2		5	May 11, 1954
4. 11 Miles	3	2	6		17	May 13, 1953
"	2	2		2	6	May 6, 1954
5. 13 Miles	1		3		7	May 14, 1953
"	1	1			2	May 13, 1954
6. 12 Miles route established in 1954						
	3			1	4	May 10, 1954
7. 18 Miles	6	5		4	15	May 5, 1953
"	1		1	5	8	May 7, 1954
8. 9 Miles	1		1		3	May 6, 1953
"		1			1	May 5, 1954
66 Miles Total all Routes	11	7	10	12	50	May 5-14, 1953
78 Miles Total all Routes	9	5	3	8	28	May 5-13, 1954

1. Males
2. Females
3. Pairs
4. Unidentified as to sex

Production Indices -

On-the-spot check counts in the prairie marshes of northwest Iowa each spring and summer since 1949, plus aerial coverage of the same marsh units since 1952, have provided a studied opinion as to the production trends of blue-winged teal and mallards. Blue-winged teal constitutes the most numerous nesting species in the remaining prairie marshes, and the mallard is not far behind. Production of these two species in 1954 remained about the same as in 1952 or 1953 with no appreciable change in nesting numbers. With the exception of increased

production in 1951 which resulted from optimum water levels, excellent nesting and survival conditions, the production trend of ground nesting species, especially blue-wings and mallards, tend to remain about the same under average phenological conditions. During the last five years of systematic observation, 1951 marks the only year when a large increase of breeding stock occupied the many temporary potholes and nested successfully. The production of wood duck is not well understood.

Conclusions -

In view of the reduced breeding population of wood duck it is estimated that duck production in Iowa will be about the same or somewhat reduced as compared to 1953.

WISCONSIN

Weather and Water Conditions -

Precipitation for the period of September 1, 1953 to March 1, 1954 was approximately 56 percent of normal. During March and the first half of April, 1954, precipitation was slightly below average. Heavy rains during the last half of April brought the total for the month to 2.79 inches above normal.

Waterfowl nesting started about one week later than the slightly early year of 1952 and is considered average, as compared to the past five years.

The heavy rains of late April undoubtedly caused some nest destruction of early nesting mallards in certain localities. Heavy rains in certain regions in June may have caused further nest losses, especially to later nesting species such as the blue-winged teal. However, the State-wide loss of waterfowl nests due to flooding should be minor since the two main species breeding in Wisconsin, the mallard and blue-winged teal, are primarily upland nesters. In certain types of water sites, broods were more difficult to observe due to the additional vegetation which was flooded. This factor makes it necessary to qualify the results of the 1954 brood counts.

Of 284 water sites censused twice during these surveys, 81 percent showed no change or more water during the second coverage as compared to the first coverage. During June and early July, above normal precipitation was experienced.

Breeding Population Indices -

Based on a randomized spot-type sampling system using ground methods, the breeding population of mallards and ringnecks remained the same as 1953, blue-winged teal and black ducks decreased slightly, and wood duck showed a fair increase. It is also worthy of note that each year since 1951, a greater percent of the areas visited have been occupied (64 percent in 1954). The number of breeding pairs per acre was the same as in 1953, but ducks utilized a greater share of the more permanent water sites covered by the survey.

Of the flocked birds observed this year, a greater percent was made up of female ducks than in any year since 1951. The implication is that due to the heavy rains of late April, some of the birds did not breed or they did not re-nest after nest destruction took place.

Production Indices -

The following table summarizes the pertinent figures concerning the 1954 Wisconsin waterfowl production picture. Recognizing (1) that brood observations were made with relatively high water levels existing (2) that the figure on the breeding duck pairs per acre was the same as the 1953 high figure (3) that the average brood size remained high, as it was in 1953 (4) that a greater percent of the female ducks did not nest successfully and (5) that the young per breeding pair of ducks showed a substantial decrease, it is concluded that waterfowl production in Wisconsin decreased slightly in 1954 from the high level existing in 1953. However, compared to the past three years, 1951-1953, the 1954 production level is good.

	1951	1952	1953	1954
Pairs per Acre	.078	.092	.180	.180
% Indicated Change	-	+18	+96	None
% Female of total Flocked Birds	16	19	27	35
Young / Breeding Pr.	1.46	2.58	2.35	1.51
% Indicated Change	- -	+ 77	- 9	- 36
Av. Brood Size	6.5	6.6	7.0	7.0
% Indicated Change	-	+ 2	+ 6	None

Conclusions -

The fall flight of ducks from Wisconsin will decrease slightly in 1954 from the high level existing in 1953.

MICHIGAN

Weather and Water Conditions -

Weather conditions and water levels generally have not been conducive to nesting.

Low temperatures, snow squalls and heavy rains may have reduced this year's production. The U. S. Weather Bureau reports April as the fifth wettest April in Michigan since records began in 1887. May was the second snowiest, seventh coolest, and would have been the driest if general rain had not occurred on the last day of the month. Rain storms continued throughout June with the heaviest precipitation occurring in the north and central portions of the State. As much as nine inches of rain was recorded at some locations.

The water-filled swales and ponds resulting from heavy precipitation may have encouraged wide dispersal of the broods, which may have an influence on the interpretation of the results of brood surveys.

Although we have no measure of the effect these weather conditions had on the nesting population, we are of the opinion that these conditions were abnormal and probably unfavorable.

Breeding Population Indices -

On sample check areas scattered throughout the State, District Game Biologists found a nesting population equal to the high population observed last year. The potential breeding population compared to the previous years is shown below:

Year	Lineal Miles Censused	Potential Breeders Per Lineal Mile
1949	85	6.80
1950	81	7.91
1951	120	8.18
1952	82	7.13
1953	95.5	12.75
1954	93.5	12.31

The species composition of the potential breeding population as determined on these sample check areas was as follows:

Mallard	23.0 percent
Black Duck	22.0 percent
Blue-winged Teal	32.8 percent
Wood Duck	4.7 percent
Ringneck	2.8 percent
Merganser	1.3 percent
Unidentified	13.4 percent

The results of the ground survey indicate slightly fewer potential breeders present in 1954 compared to 1953, but more than the 6-year average. A marked increase in blue-winged teal was noted.

Production Indices -

Following the boat surveys to determine potential breeding populations, brood censuses were made on the same sample check areas to determine nesting success. Information obtained from these brood censuses can be used only as an index of production, since many broods are unobserved in the dense cover typical of our marshes.

Year	Broods Per Lineal Mile	Hens & Young / Lineal Mile	Bachelor Ducks / Lineal Mile	Av. Size of Broods Observed
1949	.47	2.75	6.50	6.00
1950	.34	2.32	5.50	5.87
1951	.35	2.20	3.31	5.76
1952	.70	3.92	3.21	4.60
1953	.51	3.63	4.32	6.10
1954	.20	1.45	4.60	6.24

In addition, an aerial survey of a 272 lineal mile sample area was carried on for the third year. The results follow:

	1952	1953	1954
Bachelor Birds	12	7	16
Adult female and young	5 + 35	11 + 78	5 + 22
Total birds	52	96	31
Young per brood	7	7.1	4.4
Broods per square mile	.073	.162	.044
Hens & Young per square mile	.588	1.308	.399
Young per square mile	.514	1.147	.323
Bachelor ducks per square mile	.176	.103	2.35

Judging from the results of the boat and aerial surveys, the hatch has been below average in Michigan this year.

Conclusions -

The number of birds moving southward from Michigan will be less than last year.

INDIANA

Weather and Water Conditions -

Drought conditions prevailed during the early part of 1954. Pothole nesting habitat in northern Indiana received 4.50 inches of rain in April, but precipitation during May and June was below normal. A general rain throughout the northern part of the State occurred in July. Of 17 pothole study areas checked for water levels during the last week of June, 29 percent were still dry, 29 percent were less than two-thirds full, and 42 percent were normal. This represents a slight improvement over a similar period in 1953.

Breeding Population Indices -

No breeding population surveys were conducted.

Production Indices -

Wood Duck brood production was determined for 143 miles of stream scattered throughout the State, and for the Willow Slough Game Preserve. The following table presents the data from the stream survey:

Wood Duck Broods Observed in 1954 by Transects and Age Class Compared With Total Observed in 1953

Stream	Length in Miles	Date Floated	Age Class					1954 Total	1953 Total
			Ib	Ic	IIa	IIb	IIc		
Muscatatuck	19	6/2	9	4	8	3		24	34
Salt Creek	15	6/3	1	2				3	6
Eel (Clay Co.)	13	6/8	3	4	1	2		10	8
White	25	6/9	2	4	9	6	4	25	12
Big Blue (Shelby Co.)	12	6/10	1	1	6	2		10	10
Mississinewa	13	6/15	1	1	1	2	2	7	5
Elkhart	17	6/14						0	5
Iroquois	14	6/16		1	1			2	3
Maumee	15	6/18	2	1	1	3	1	8	8
Total	143	6/2-18	19	18	27	18	7	89	91

Using 1950 as the first year of comparable data in Indiana, 59.2 wood duck broods were observed per 100 miles of stream transects. The number increased to 64.2 in 1951, and 72.3 in 1952, but dropped to 63.6 in 1953, and 62.2 in 1954. Meanwhile, the average number of young wood duck per brood was 7.1 for 1951 and 1952, increased to 8.8 in 1953, and dropped back to 8.3 in 1954. As compared to 1953, the drop in broods and decrease in number of young per brood resulted in a decrease in total production of 44 young per 100 miles or or 7.9 percent. The first appearance of broods was about 2 weeks later than usual this year.

Conclusions -

The production of wood ducks will be slightly less than last year in Indiana.

OHIO

Weather and Water Conditions -

Weather and water conditions were in general favorable to waterfowl production during the spring of 1954. The Lake Erie Marshes, which are periodically inundated by the high water levels of Lake Erie effecting heavy losses of nests and eggs, contined a fairly even water level throughout the early spring months.

Breeding Population Indices -

Following are the findings from areas under observation during the spring of 1954.

Table 1 - Aerial Breeding Pair Survey, Lake Erie Marshes*

Species	Pairs 1953	Pairs 1954	Pairs per sq. mi. 1953	Pairs per sq. mi. 1954	Percent Change
Mallard	122	71	8.7	7.1	- 18.39
Black	88	91	6.3	9.1	+ 30.78
Blue-wing Teal	11	11	.8	1.1	+ 27.28
Wood Duck	4	5	.3	.5	+ 60.00
Total	225	171	16.1	17.8	+ 9.55

Table 2 - Waterfowl Breeding Pair Survey, Magee Marsh (1,960 acres) 1953 - 1954

Species	Pairs 1953	Pairs 1954	Pairs per sq. mi. 1953	Pairs per sq. mi. 1954	Percent Change
Mallard	31	27	10.00	8.82	- 12.91
Black	9	13	2.90	4.24	+ 30.77
Blue-wing Teal	10	9	3.23	2.94	- 10.00
Wood Duck	4	8	1.29	2.61	+ 50.00
Green-wing Teal	-	1	-	.33	-
Total	54	58	17.42	18.94	+ 7.08

* 105 linear miles flown during 1953 (13.9 sq. miles).
80 linear miles flown on same but reduced transect during 1954 (10 sq. miles).

Table 3 - Waterfowl Breeding Pair Survey, Resthaven (2,100 acres)

Species	Pairs 1953	Pairs 1954	Pairs per sq. mi. 1953	Pairs per sq. mi. 1954	Percent Change
Mallard	43	39	13.03	11.82	- 24.00
Black	25	33	7.58	10.00	+ 32.00
Wood Duck	3	2	.91	.61	- 33.00
Blue-wing Teal	2	2	.61	.61	-
Total	73	76	22.13	23.04	+ 4.11

Production Indices -

Success of the Season

In the Lake Erie Marsh region there was an increase of broods at both Magee Marsh and the Resthaven Area. The increase at Magee Marsh was three broods over last year with a slight reduction in the average brood size. At Resthaven there was an increase of one brood over last year with a fairly substantial reduction in average brood size.

Table 4 - Brood Observations on Magee Marsh and Resthaven

	No. of Broods		Ave. Brood Size		Total Young		Percent
	1953	1954	1953	1954	1953	1954	Change
Magee Marsh	24	27	5.4	5.3	130	143	+10
Resthaven	15	16	7.7	5.2	116	83	-28
Total	39	43	6.3	5.2	246	226	- 8

Conclusions -

The 1954 waterfowl breeding grounds surveys (breeding pairs and brood censuses) in Ohio indicate that there was a small increase in both breeding pairs and broods over the previous year, but with a somewhat smaller number of ducks per brood. Therefore, it would appear that the total production should be about the same as last year.

NORTHERN ALBERTA AND NORTHWEST TERRITORIES

(See Page 15)

SOUTHERN SASKATCHEWAN

(See Page 34)

Atlantic Flyway Data

Waterfowl Kill Information

The following table presents the estimated kill of waterfowl during the 1952-53 and 1953-54 shooting seasons as determined by the Waterfowl Hunter Mail Survey:

Species	Total Kill * 1952-53	1953-54	Percent Change
Mallard	205,935	300,380	+ 45.86
Black Duck	346,252	239,680	- 30.78
Wood Duck	- **	114,875	-
G-w. Teal	57,144	85,470	+ 49.57
B-w. Teal	47,943	64,280	+ 34.08
Pintail	60,170	63,255	+ 5.13
Baldpate	65,376	33,835	- 48.25
Scaup	87,168	55,800	- 35.99
Canvasback	54,601	49,540	- 9.27
Other Ducks	286,082	240,056	- 16.09
Total Ducks	1,210,671	1,247,171	+ 3.01
Canada Goose	76,977	61,165	- 20.54
Brant	6,041	3,060	- 49.35
Other Geese	3,785	1,482	- 60.85
Total Geese	86,803	65,707	- 24.30
Coot	177,105	122,773	- 30.67

* Includes both retrieved and unretrieved birds.

** Included under "Other Ducks" during the analysis of 1952-53 data.

Number of Hunters, Daily Kill, Seasonal Kill, and Average Number of Times Hunted as Determined by the Waterfowl Hunter Mail Survey

		1952-53	1953-54	Percent Change
Number of Hunters				
Over 16		306,372	338,234	+ 10.4
Under 16		11,271	11,273	0.0
Average Daily Kill				
Over 16	Ducks	.76	.82	+ 7.9
	Geese	.05	.04	- 20.0
	Coot	.09	.08	- 11.1
Under 16	Ducks	.36	.43	+ 19.4
	Geese	.002	.01	+500.0
	Coot	.15	.15	0.0
Average Seasonal Kill				
Over 16	Ducks	3.01	2.81	- 6.6
	Geese	.21	.15	- 28.6
	Coot	.37	.26	- 29.7
Under 16	Ducks	1.42	1.48	+ 4.2
	Geese	.01	.04	+300.0
	Coot	.61	.51	- 16.4
Average Times Hunted		3,971	3.438	- 13.4

The over-all kill of ducks in the Atlantic Flyway remained about the same during the 1953-54 season, while the kill of geese and coot decreased somewhat (24 and 31% respectively). The number of hunters increased slightly, while the average number of times afield during the season decreased to the extent that the total man days afield during the 1953-54 season was slightly less than in 1952-53.

Regarding kill by species, it is of interest to note that mallard has replaced the black duck as chief bird in the bag for the first time. Although not indicated in the data, this was a result of an increased kill of mallard in the southern part of the Flyway.

Winter Trend Data - Atlantic Flyway

In the ATLANTIC FLYWAY adverse weather conditions were encountered during the survey period, which were believed responsible for shifts in location of waterfowl populations. Flyway conditions were unsatisfactory throughout much of the survey period with resultant delays and possible double counting or omission. In spite of the cold fronts which hit the North and Middle Atlantic States just prior to and during the survey, the total estimated waterfowl for the South Atlantic States was only half that of the corresponding time last year. In the West Indies, flying conditions were satisfactory during the survey period.

Percent Change in Atlantic Flyway (Continental) Populations Index Figures for Ducks, Geese, Brant, Swan and Coot from January 1953 to 1954

Area	Ducks	Geese	Brant	Swan	Coot	Total
Canada *	+11.5	-21.8	-	-	-	+10.2
Atlantic Flyway States	-17.3	-24.4	+57.9	- 4.3	-76.3	-28.1
West Indies	-44.4	-	-	-	-10.9	-39.8
Total	-17.0	-24.4	+57.9	- 4.3	-74.9	-27.4

Species Composition - Atlantic Flyway (Continental) 1953 and 1954

Species	Percent of Birds Identified 1953	1954	Percent Change 1953-1954
Scaup	20.1	22.7	- 23.2
Canvasback	5.6	10.0	+ 22.6
Black Duck	8.5	9.8	- 22.2
Pintail	4.9	8.5	+ 16.8
Canada Goose	7.5	7.5	- 31.6
Coot	20.5	7.2	- 76.3
Amer. Brant	2.3	5.5	+ 57.8
Mallard	4.2	5.4	- 12.4
Baldpate	3.8	3.6	- 34.2
Wood Duck	2.2	2.9	- 11.0
Redhead	2.8	2.6	- 35.9
Ringneck	4.3	2.4	- 62.0
Ruddy Duck	2.4	2.1	- 41.4
Snow Goose	.8	1.6	+ 29.8
Goldeneye	1.2	1.6	- 7.9
Whistling Swan	.8	1.2	- 4.3
Merganser	1.3	1.1	- 39.2
Scoter & Eider	3.0	1.1	- 75.9
Bufflehead	.6	.7	- 17.5
G-w. Teal	.9	.7	- 50.1
B-w. Teal	1.1	.6	- 59.2
Gadwall	.7	.6	- 44.3
Old Squaw	.4	.3	- 52.9
Shoveler	.1	.3	+ 82.2
Blue Goose	tr.	tr.	-
Total	100.0	100.0	- 31.6

Summary of Atlantic Flyway Waterfowl Indices

Waterfowl - The 1954 index indicates no consistent population trend up or down in the Atlantic Flyway for the period 1950-54. This year's index is 1 percent below the 5-year average and compared to individual years is:

27 percent below 1953
1 percent above 1952
14 percent above 1951
28 percent above 1950

Ducks - The index this year is 5 percent above the average for the past 5 years and compared to individual years stands:

17 percent below 1953
1 percent below 1952
17 percent above 1951
40 percent above 1950

Among the ducks, the indices were:

1. About the same for: mallard, wood duck, and goldeneye.
2. Noticeably down for: baldpate, redhead, ringneck, ruddy, merganser, green-winged teal, blue-winged teal, gadwall, and old squaw.
3. Noticeably up for: canvasback and shoveler.

Geese - The 1954 index for geese is 4 percent above the average level for the past 5 years and compared to individual years is:

24 percent below 1953
21 percent above 1952
25 percent above 1951
20 percent above 1950

Compared to 1953, the Canada goose decreased and the snow goose increased.

Brant - The brant index is 76 percent above the average for the past 5 years and compared to individual years is:

58 percent above 1953
135 percent above 1952
116 percent above 1951
217 percent above 1950

Swan - The 1954 swan index is 27 percent above the average for the period 1950-54 and compared to individual years is:

4 percent below 1953
48 percent above 1952
56 percent above 1951
74 percent above 1950

Coot - The coot index in the Atlantic Flyway is the lowest it has been in several years, being 50 percent below the average for the past 5 years and compared to individual years is:

75 percent below 1953
35 percent below 1952
37 percent below 1951
47 percent below 1950

QUEBEC AND LABRADOR

Weather and Water Conditions:

During May, the southern half of Quebec and Labrador experienced precipitation four times above the average for the past four years with the mean temperature five degrees below normal. June had average rainfall and temperatures, but so far July has had twice the normal number of days with rain, and temperatures have been about three degrees below average.

There are no definite data available yet on weather in the northern part of the area, but June is reported to have had above normal rainfall and below normal temperatures. May and July appear to have been about average.

Heavy and frequent rainfall over broad areas coupled with below normal temperatures during the nesting and brooding period can have a rather serious effect on production. This is particularly true in the north where production may be dependant on the success or failure of a single effort.

Breeding Population Indices:

Aerial breeding population surveys were conducted during May and early June. The data are presented in Table I.

It is apparent that the breeding population of ducks increased an appreciable amount this year. Among the various species, black duck, goldeneye, and ringneck increased the most, while decreases were recorded for scaup, merganser, and scoter.

The breeding population of Canada geese decreased approximately 30 percent.

Production Indices:

An aerial production survey was conducted during mid-July. The results are presented in Table II.

Among ducks, a marked reduction in number of broods and number of young was recorded (44 and 50% respectively). Although difficult to demonstrate, it seems likely that some aspect of the weather which was experienced during late May and June affected nesting success adversly. Included in Table II are index figures concerning possible later broods as evidenced by singles and pairs observed on July Transects. Actually, there is little information to show that in the north country a bird unsuccessful through mid-July has much

of a chance of producing a brood. For what they are worth, however, these data indicate that there were approximately the same number of pairs and singles still on transect during July this year as there were last.

The number of Canada goose broods decreased also (- 35%). However, a decided increase in the average brood size partially compensated for this decrease, leaving the estimate of number of young produced only 18% below last year. It is of interest to note that among Canada broods this year, 11% were class I, 50% were class II, and 39% were class III. Last year, surveys at about the same date indicated that 13% were Class I and 87% were Class II. No Class III were recorded. In northern Quebec and Labrador, the season was about two weeks earlier than last year, and the goose brood data seems to bear this out.

Conclusions:

The number od ducks moving southward from Quebec and Labrador will be noticably less than last year, and there will be a moderate decrease in the number of geese.

Table I - Waterfowl Breeding Population Index - Quebec and Labrador

Species	1953	1954	% Change
Black Duck	235,500	305,740	+29.83
Goldeneye	99,323	310,658	+212.78
Ringneck	886	57,239	--
Scaup	62,125	47,309	-23.85
Green-winged Teal	--	1,023	--
Unidentified	100,130	211,265	+110.99
Merganser	501,047	353,957	- 29.36
Scoter	155,944	132,373	- 15.12
Eider	7,370	0	--
Old Squaw	2,514	3,481	+ 38.46
Total Ducks	1,164,839	1,423,045	+ 22.17
Canada Goose	315,623	220,922	- 30.00

Table II - 1954 Production Inventory - Quebec and Labrador

	Total Brood Index		Total Young Index		Potential Later Broods *	
	1953	1954	1953	1954	1953	1954
Ducks	63,113	35,330	333,878	166,867	100,154	98,964
Percent Change		- 44%		-50%		-1%
Canada Goose	16,276	10,546	43,222	35,619	8,451	20,858
Percent Change		- 35%		- 18%		+147%

*Number of pairs and single birds on July transects

MARITIME PROVINCES

Weather and Water Conditions -

The spring of 1954 was about a week late, after a fairly mild winter. The spring break-up of ice in the rivers was a little late and ice remained in the lakes longer than usual.

In May and June the hours of sunshine were reported below normal.

The water run-off was above normal this year and the annual freshet of the Saint John River rose about 22 feet above mean summer level. Wet weather in late May and June has caused another rise in water level which has probably flooded some ground nests.

The wet weather has continued on throughout the summer to date, causing the water levels to be considerably above normal.

Breeding Population Indices -

Aerial coverage of breeding populations was carried out again by the U. S. Fish and Wildlife Service. Table I gives a comparison of this year's results with 1952 and 1953.

Table I - Breeding Population Trends - 1952-1954

	Black Ducks			Total Game Ducks		
Coverage	1952	1953	1954	1952	1953	1954
Birds per square mile						
Inland Transects						
(1) Boreal Forest	0.94	0.84	0.94	1.48	1.14	1.24
(2) Northeastern Wildlife Station Study Area	--	6.68	13.70	--	13.29	23.16
Birds per linear mile						
Shoreline Counts	4.00	6.10	4.05	5.24	7.44	5.60

As will be seen from this table, an increase was noted in the inland transects, including the boreal forest and the Saint John River Study Area. The shoreline counts, however, present a different picture. The decrease shown here can be partly accounted for by the drop in the numbers of black ducks in the coastal concentrations.

Production Indices -

Table II gives the results of the 1954 aerial production survey compared with 1952 and 1953.

Table II - Comparable Aerial Brood Survey Data

	1952	1953	1954
Black Duck			
Adult	875	1,516	894
Broods	60	46	55
Ringneck			
Adult	86	116	237
Broods	6	4	-
Goldeneye			
Adult	54	66	61
Broods	1	9	2
Total Game Ducks			
Adult	1,112	1,780	1,263
Broods	75	59	59

As has already been pointed out, weather conditions for 1954 have been behind last year. This could have influenced the brood data in the following manner. It could have delayed the main hatch of black ducks and thus given a larger number of non-flying young this year as compared with last year. Some of last year's so-called "adults" may have been in effect flying young.

Ground surveys throughout the Maritime Provinces showed that less broods than average were observed in 1954. It is probable that the higher water level in most duck breeding areas allowed the broods to stay in cover in which they were extremely difficult to find. Broods were large this year and averaged 7.3 ducklings per brood for all species. Black duck broods averaged 7.2 ducklings and goldeneye 7.4. Numbers of ducklings in Class I and II broods were especially high.

Conclusions -

It is anticipated that the fall flight from the Maritime Provinces will be about the same as last year.

NORTHEASTERN STATES

Weather and Water Conditions -

The weather in the northeast, both during the winter period and during the breeding season, has been quite variable. The early winter period was mild, then during January severe cold frozen inland waters and coastal bays from Chesapeake Bay north. The spring period was cool over much of the region and the New York - New England area experienced considerably above normal precipitation (15-38%) with severe floods developing in some areas, particularly Massachusetts. The Middle Atlantic States throughout the winter, spring and early summer periods has experienced deficiencies in precipitation, averaging about 75% of normal.

The prolonged wet spring and early summer in the New York - New England area would undoubtedly have an adverse effect on production. In some areas of the Middle Atlantic (New Jersey) it was reported that frequent high tides were probably destructive of marsh nesters.

Breeding Population Indices -

Although no breeding pair surveys were carried out it is believed that breeding populations were good.

Production Index -

Aerial Surveys, based on requirements for the northeastern region as a whole, were carried out by New York, New Hampshire, Maine, Connecticut, New Jersey, Delaware and Maryland. All surveys are comparable with last year's except those from Maine, which were seen for the first time this year.

The results of the aerial surveys are shown in Table I.

Table I Aerial Production Indices for New York, New Hampshire, Connecticut, New Jersey, Delaware and Maryland.

Year	Total Broods	Total Young	Ave. Brood Size	Total Adults	Total All Ducks
1953	8313	51,585	6.20	204,517	256,102
1954	5667	33,910	5.98	38,944	72,854
% Change	-32	- 34	-4	- 81	- 72

The data indicate a marked reduction (32%) in broods and an even greater decrease in total ducks, amounting to 72%. Time does allow for statistical analysis of these figures to determine their true value. Very probably the decrease in total birds would fall somewhere between 32 and 72 percent.

In addition to aerial surveys, reports were received from ground sample areas in most of the northeastern states. The results obtained on these sample areas are presented in Table II.

Table II 1954 Summer Brood Surveys in Northeastern States *

Species	Number Broods		Ave. Brood Size		Total Young		% Change
	1953	1954	1953	1954	1953	1954	
Black Duck	380	373	6.1	5.8	2310	2171	-6
Wood Duck	445	478	9.2	8.8	4101	4230	+3
Mallard	93	95	6.3	5.2	592	499	-16
Blue-winged Teal	22	20	7.4	7.8	162	157	- 3
Total	940	966	7.6	7.3	7165	7057	- 1.5

* Number of Areas by States as follows

State	1953	1954
Connecticut	24	43
Delaware	6	3
Maine	13	27
Massachusetts	40	43
N. Hampshire	10	14
New Jersey	10	7
New York	7	16
Rhode Island	14	12
W. Virginia	4	2
Virginia	1	1
Total	129	168

The sample area data indicate that production on the areas surveyed was about the same as last year. The degree to which these sample areas represent the entire area is not well understood.

Conclusions -

Considering all data, it is estimated that there will be a slight decrease in production this year from the Northeastern States with some States, such as Maine, producing about the same as last year.

NORTHERN ALBERTA AND NORTHWEST TERRITORIES

(See Page 15)

NORTHERN SASKATCHEWAN, NORTHERN MANITOBA AND ONTARIO

(See Page 60)

SOUTHERN SASKATCHEWAN

(See Page 34)

SOUTHERN MANITOBA

(See Page 57)

SUMMARY OF CONDITIONS

PACIFIC FLYWAY

The mid-winter survey of waterfowl indicated little change in the numbers of ducks, geese, or brant. The population of coot increased for the second consecutive year.

In the areas supplying the Pacific Flyway with waterfowl, breeding populations increased in Alaska, southern Alberta, Utah and Montana. Decreases were recorded in northern Alberta and the Northwest Territories and California. Breeding populations were about the same in British Columbia, Washington and southern Saskatchewan.

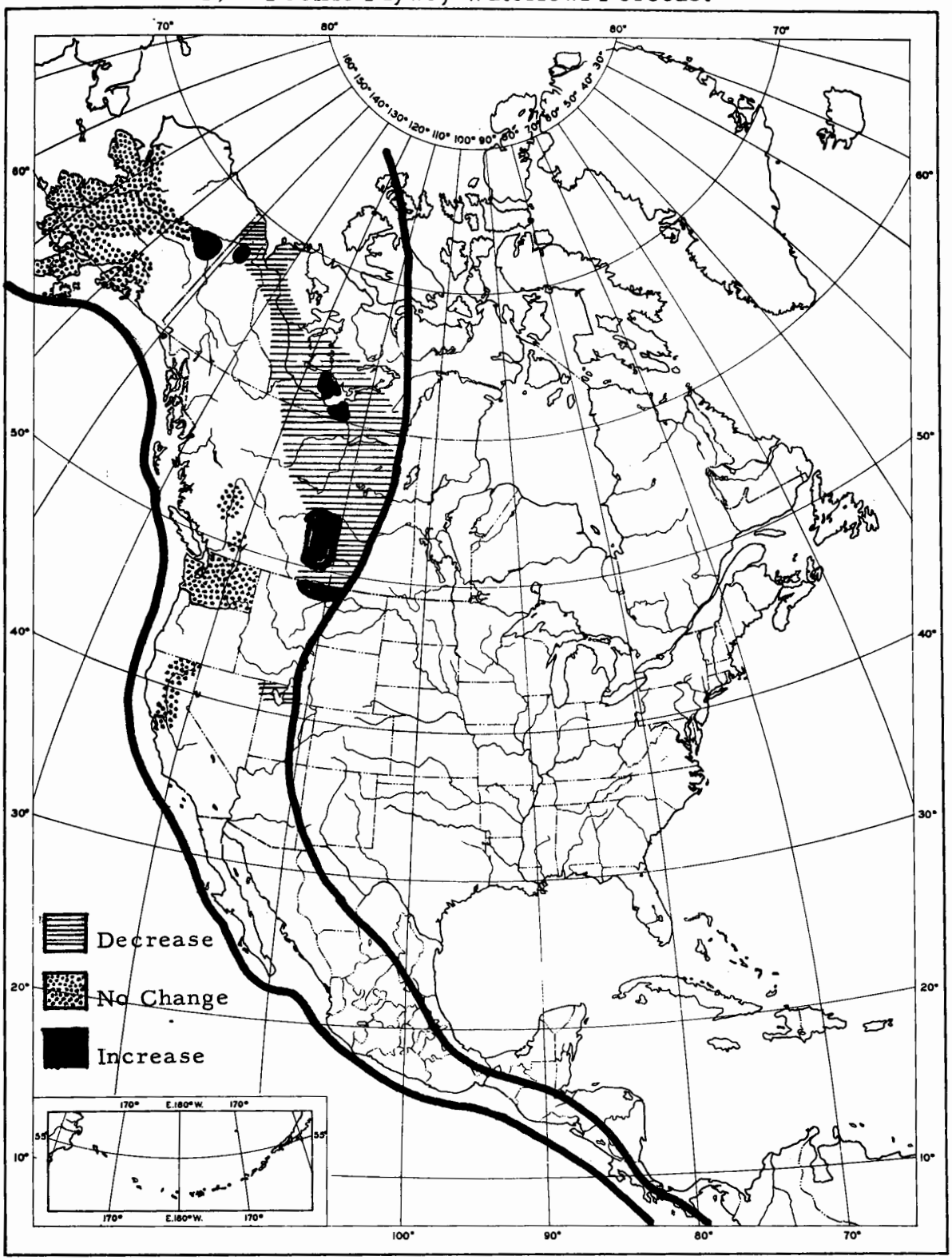
Weather and water conditions were somewhat spotty this year as far as waterfowl production in the Pacific Flyway was concerned. Spring was early in northwestern Alaska, but late in all of the remaining breeding areas, averaging from 10 days to 3 weeks behind last year. Excessive rains fell in portions of the Northwest Territories, parts of Saskatchewan and British Columbia. Water conditions were good in southcentral Alberta and eastern Montana, but drought was prevalent in southern Alberta, western Montana and Utah. Over-all, weather conditions in the Pacific Flyway breeding range were conducive to average production.

Production surveys during July have indicated there will be an increased number of young produced in parts of Alaska, southern Alberta, and Montana. Decreases are expected in most of the Northwest Territories, northern Alberta, Saskatchewan and Utah, while about the same production is estimated in most of Alaska, British Columbia, Washington and California.

Little information is available regarding changes in the population of geese, except from the mid-winter survey. The January 1954 survey indicated geese were at about the same level as in 1953, but somewhat below the average for the past 5 years.

Over-all, it is estimated the gains in Alberta, Montana, and a few small areas in the Far North will off-set the losses elsewhere and; the fall flight of ducks in the Pacific Flyway will be about the same magnitude as last year. Also, it is estimated the flight of geese will be about the same, while the flight of coot will increase.

1954 Pacific Flyway Waterfowl Forecast



CENTRAL FLYWAY

The mid-winter survey of waterfowl indicated there was a general increase in waterfowl populations in the Central Flyway. A small increase in ducks was recorded, while the data indicated a considerable increase in geese, and a major increase in coot.

In the areas supplying the Central Flyway with birds the over-all breeding population was quite similar to the high breeding population of last year. Increases were recorded in Alaska, southern Alberta, southern Manitoba and Montana. These increases were offset by decreases in northern Alberta, the Northwest Territories, northern Saskatchewan, northern Manitoba, North Dakota, South Dakota and Nebraska. Breeding populations remained unchanged in southern Saskatchewan.

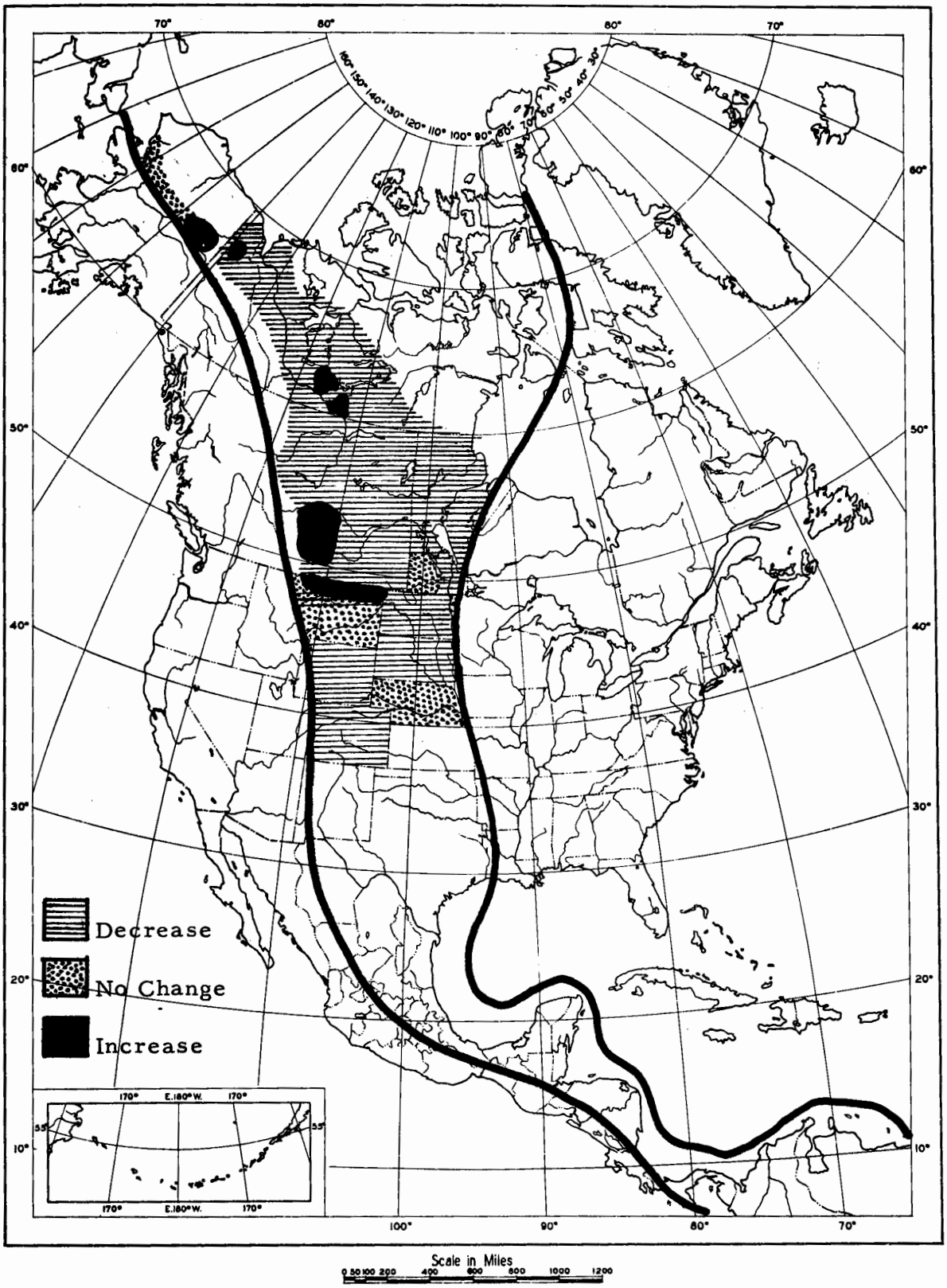
The breeding season was uniformly late throughout the Central Flyway breeding range. Cold, rainy weather during May and June retarded nesting from 10 days to 3 weeks in most places. Droughty conditions prevailed in some localities during early May, but frequent rains raised water levels during the course of the summer in most of the important prairie nesting habitat. Drought conditions continued into the summer in western Montana, southern Alberta, and South Dakota.

The late season, plus cold rainy weather apparently had an adverse effect on duck production. It is anticipated there will be a definite decrease in the number of young produced in the Northwest Territories, and moderate decreases will occur throughout Saskatchewan, northern Manitoba, North Dakota, South Dakota and Nebraska. Increased production is predicted for southern Alberta and Montana, and it is estimated that production will be about the same as last year in Alaska, southern Manitoba and Nebraska.

Relatively little is known about the production of geese in the Central Flyway. However, late seasons in the North are unfavorable to production. Therefore, it is estimated the production of geese will decrease this year.

Over-all, it is estimated for the second successive year there will be a moderate decrease in the fall flight of ducks in the Central Flyway. It is believed the increase in breeding population of geese, as indicated by the winter survey, will balance the decrease in production, resulting in a fall flight approximately equal to last year.

1954 Central Flyway Waterfowl Forecast



MISSISSIPPI FLYWAY

The mid-winter survey in the Mississippi Flyway indicated populations of ducks and geese remained about the same as last year. Numbers of coot were still below the average for the past 5 years, but showed some gain for the second consecutive year.

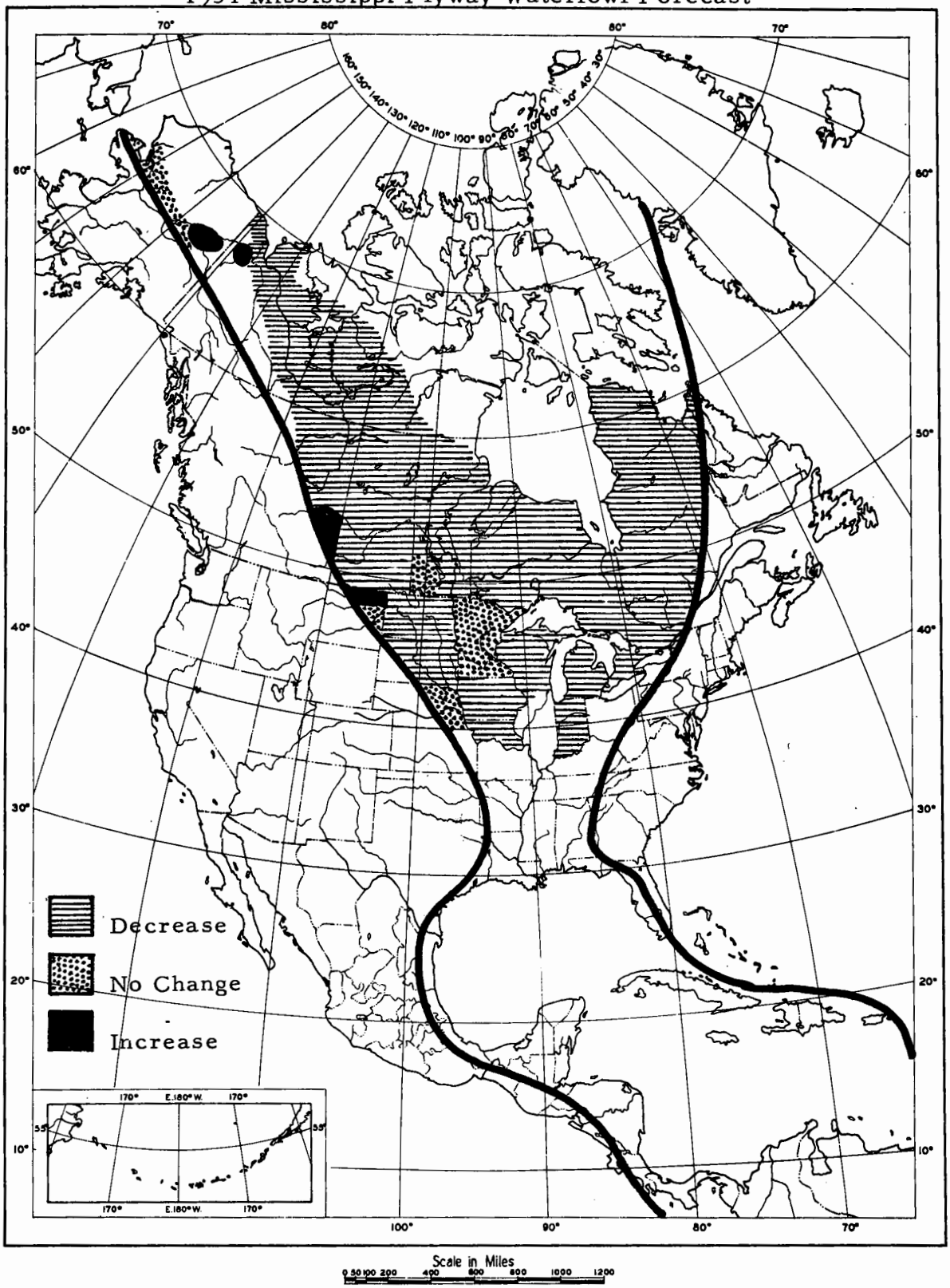
Breeding populations of waterfowl within the breeding range supplying the Mississippi Flyway remained essentially unchanged as compared to last year. Increases were recorded in Alaska, southern Alberta, southern Manitoba and Quebec. These increases were balanced by decreases in northern Alberta, Northwest Territories, northern Saskatchewan, northern Manitoba, Ontario, North Dakota, South Dakota and Nebraska. Breeding populations remained about the same in southern Saskatchewan, Minnesota and Michigan.

The breeding season was late throughout the Mississippi Flyway breeding range. Cold, rainy weather during May and June retarded nesting from 10 days to 3 weeks in most places. The index to numbers of water areas in the Canadian prairies during July was the highest it has been since breeding ground surveys were initiated in 1947. However, drought prevailed in South Dakota, and a small area in southern Alberta. In general, weather conditions have not favored waterfowl production this year in spite of the abundance of water in the important nesting areas.

Production surveys during July have indicated there will be a decrease in the number of young produced as compared to last year. Decreases were recorded in northern Alberta, the Northwest Territories, northern Saskatchewan, northern Manitoba, Ontario, Quebec, North Dakota and South Dakota. Increases were noted in southern Alberta only, while production was judged to be the same as last year in southern Manitoba, Nebraska and Minnesota.

Over-all, it is predicted there will be a definite decrease in the fall flight in the Mississippi Flyway as compared to last year. While it is believed the fall flight will still be above the average for the past 5 years, this year's decline marks the second successive year of reduced production.

1954 Mississippi Flyway Waterfowl Forecast



ATLANTIC FLYWAY

The mid-winter survey of waterfowl populations in the Atlantic Flyway indicated a reduction in numbers for the first time in several years. Moderate decreases were recorded for ducks and geese, while coot suffered a major reduction. Brant continued to increase, while whistling swan remained about the same.

Surveys of breeding population in the areas supplying the Atlantic Flyway also revealed a reduction in numbers. Although an increase in the breeding population of ducks was recorded for Quebec and Labrador, this was more than offset by decreases in the Northwest Territories, northern Alberta, northern Saskatchewan, northern Manitoba, and Ontario. Breeding populations were judged to be the same in The Maritimes, the Northeastern States, Michigan and Minnesota. The breeding population of geese in Quebec and Labrador was judged to have decreased also.

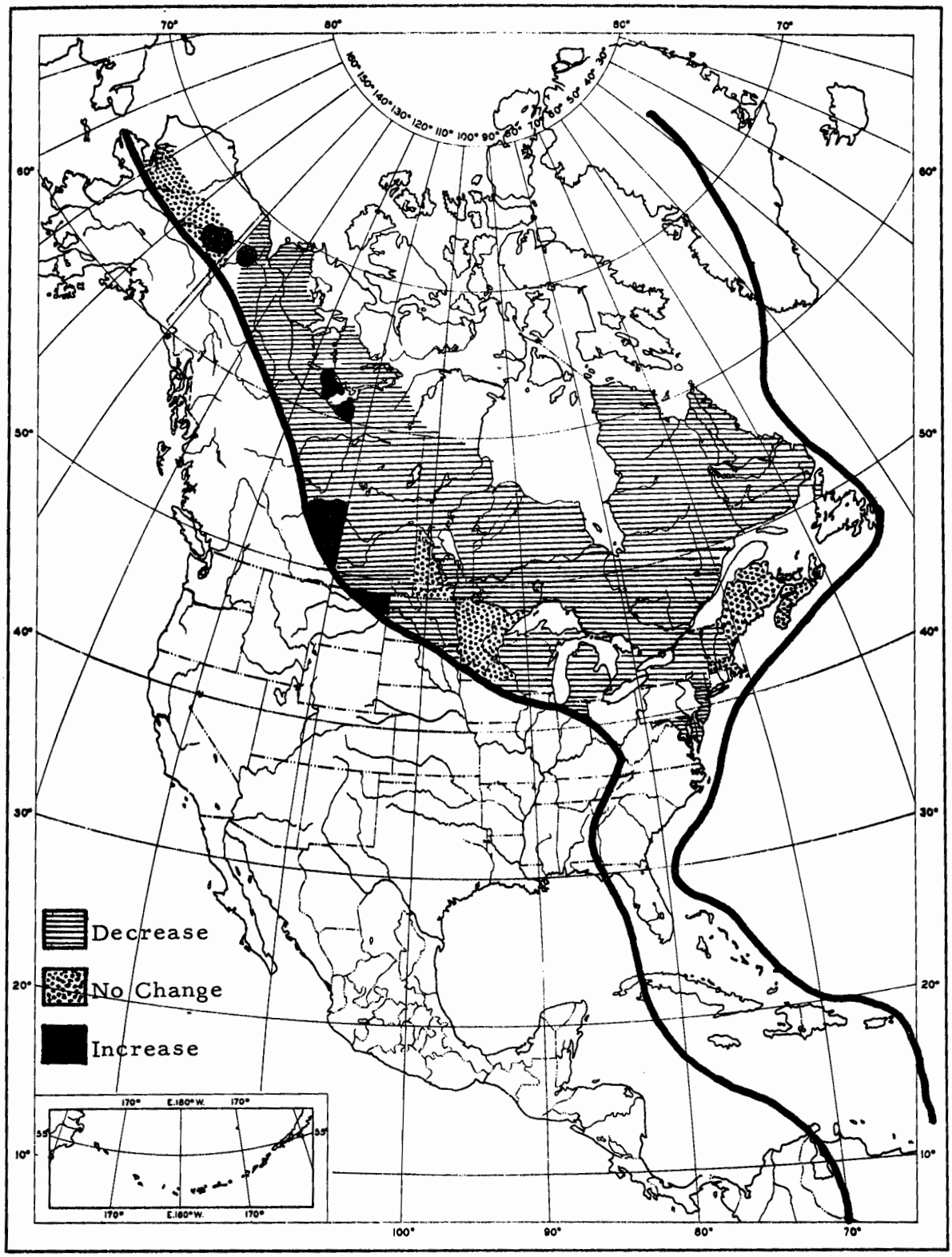
Weather during the breeding season is a factor which is not well understood in areas where lack of water is not a problem. In much of the area supplying the Atlantic Flyway the season was from 10 days to 3 weeks late. In northern Quebec and Labrador the season was about 2 weeks earlier than last year. Throughout most of the Canadian breeding grounds supplying the Flyway, there was an unusual amount of wet, cold, rainy weather during late May and June. This condition may be adverse to waterfowl production in this region.

Brood surveys during July indicated a lowered rate of production in the Flyway as compared to 1953. Production of ducks was reduced in Quebec and Labrador, northern Alberta, the Northwest Territories, Saskatchewan, northern Manitoba, Ontario, Michigan and some of the Northeastern States. Production was predicted to be the same as last year in southern Manitoba and Minnesota. There was no instances of increased production in any of the areas supplying significant numbers of ducks to the Atlantic Flyway.

The production of Canada geese in Quebec and Labrador is predicted to be less than in 1953.

Over-all, it is estimated there will be a definite decrease in the fall flight of ducks and geese in the Atlantic Flyway this year. It is believed the flight will be above the average of the past 5 years.

1954 Atlantic Flyway Waterfowl Forecast



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