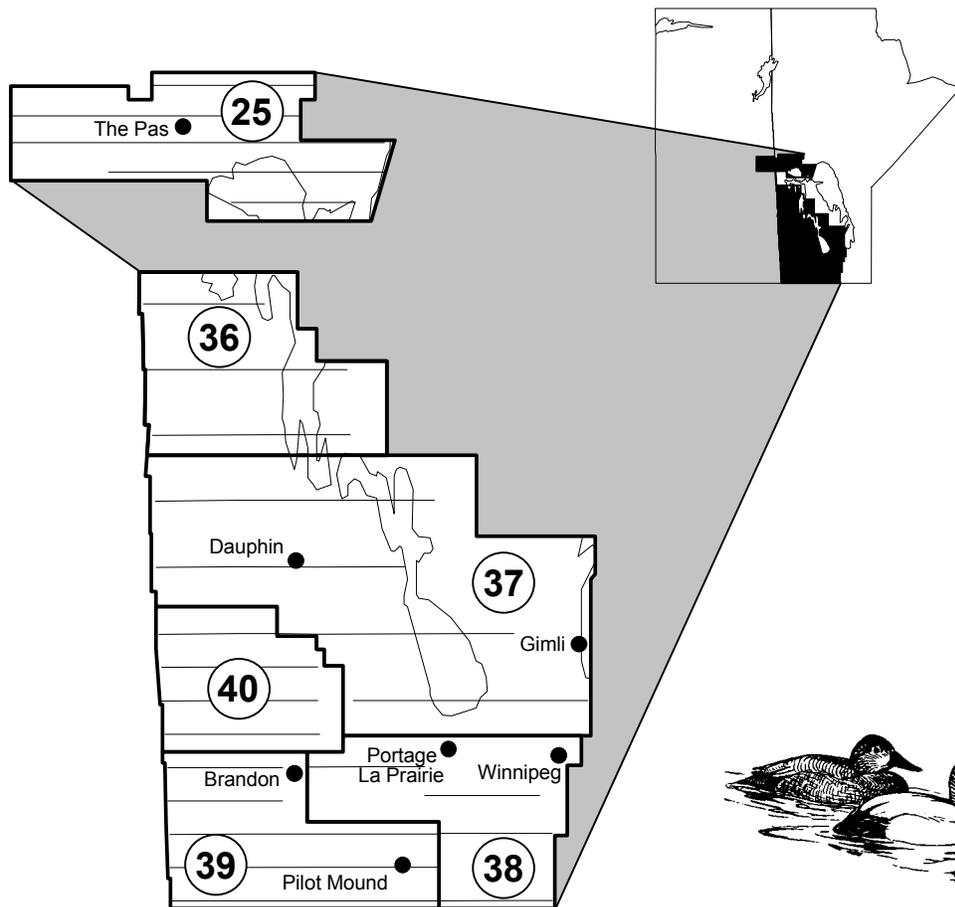


Waterfowl Breeding Population Survey

MAY 2006

Southern Manitoba and Saskatchewan River Delta



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

AND

ENVIRONMENT CANADA
CANADIAN WILDLIFE SERVICE



TITLE: Waterfowl Breeding Population and Habitat Survey for Southern Manitoba and the Saskatchewan River Delta - 2006

STRATA SURVEYED: 25, and 36 - 40

DATES: May 7 – 22, 2006

DATA SUPPLIED BY: United States Fish & Wildlife Service (USFWS)
Canadian Wildlife Service (CWS)
Manitoba Conservation (MC)
Ducks Unlimited, Canada (DUC)

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ABSTRACT:

The 2006 survey began with an aerial reconnaissance for waterfowl identification training and estimating habitat phenology on 6 May. In the author's estimation phenological conditions appeared appropriate for beginning the survey. It was believed that the majority of waterfowl species were well distributed on breeding territories. Waterfowl population estimates for strata 25, and 36 – 40 were 10.4 % higher than 2005, 7.8 % higher than the 10 year mean, and - 0.7 % lower than the Long Term Mean (LTM) from the surveys of 1955 through 2005 (Table 1). Total dabblers were 7.6 % higher, 10.4 % higher, and 0.4 % higher than 2005, the 10 year mean, and the LTM, respectively. Diving ducks, had mixed results and were 15.6 % higher, - 0.1 % lower and - 6.3% lower than the 2005, 10 year mean, and LTM, respectively. Overall pond numbers (strata 36 – 40) were estimated to be - 2.7 % lower than 2005, 17.3 % higher than the 10 year mean and 9.2 % higher than the LTM (Table 2).

METHODS:

Methods used in this survey are described in the Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America, Section III, revised in 1987. Waterfowl and wetland data were collected using laptop computers and transcribed into a program developed by Jack Hodges, Migratory Bird Management – Alaska.

This is the sixth year that the summary data from Stratum 25 has been included in these survey results. The DMBM-PAS (Populations and Assessment Section) calculated all data from previous Stratum 25 summaries and it is included in Table 1, Appendix 1, and Figure 1. Pond data is not collected in Stratum 25.

This was the eighth year King was Pilot/Observer for the Manitoba strata and the second year Scott Frazer served as observer for DMBM and the Manitoba, Southeastern Saskatchewan Area. A Cessna 206 amphibious aircraft (N728) was used for the survey. Total flight time to complete the survey in strata 25, and 36- 40 was just over 44 hours. We, also collected waterfowl population estimates and habitat conditions for Southeastern Saskatchewan (Strata 34-35) and it has been forwarded to Crew Leader Thorpe. To collect this data we also flew an additional 21 hours. Non-flight days included: zero days due to inclement weather and 4 days waiting for the ground crew to catch up to air crew.

All segments of the survey design were flown in 2006. No air ground segments had to be reflown. All 40 of the scheduled air/ground segments were flown by the air crew and counted by the ground crew.

WEATHER AND HABITAT:

Weather

The Prairie Farm Rehabilitation Administration (PFRA) and Drought Watch – Environment Canada monitors drought conditions throughout the year in Canada. Because of significant precipitation during summer and fall of 2005 saturation of the ground was as in 2005 much better than in previous years. As in 2005, substantial accumulations of snow in many areas across South central Manitoba and East central Saskatchewan during winter 2005-06 lowered the drought risk for 2006. By the end of March most areas of Manitoba had received above average precipitation. No spring soil moisture shortages were expected in Manitoba for 2006, except for the far Southwestern corner and forage production was expected to be above average across the area.

Records kept for the past 59 years revealed that during March, April and May the Southern Prairies (Southern portions of Manitoba, Saskatchewan and Alberta) were – 19.2 % drier than average and this spring was ranked as the 19th driest. Temperatures during the same period were + 2.2 degrees C warmer and ranked the 13th warmest in 59 years of data.

May, 2006 appeared to be more average than in past years. Upon arrival in the survey area on 6 May, vegetation appeared to be average phonologically and condition and numbers of wetlands varied between strata. During a general reconnaissance and waterfowl I.D. training it was observed that wetland conditions appeared to have improved over 2005, especially in the central and southwestern portion of Manitoba.

Habitat

When the survey crew arrived on 6 May, leaf out appeared to be earlier than average. This would indicate at least an average spring. Many areas in southwestern (Strata 39) and central (Strata 40) Manitoba appeared to be at good to excellent conditions. Areas in Strata 38 and 37 (where wetlands are not as defined) appeared to have more sheet water flooding. Wetland habitat where water carried over from 2005 appeared to be much better from the remaining residual vegetation from last year's growth. Better nesting habitat existed further upland in these carry over wetland basins.

After one of the warmest winters on record, Manitoba received substantial amounts of precipitation during March and April. Runoff was substantial and thousands of acres of cropland were flooded in the Red and Assiniboine River Valleys of the central and eastern portions of the area.

Strata 38, 39, and 40 of the southwestern portion of Manitoba saw substantial improvement of nesting cover habitat and stabilized wetland numbers from the high numbers recorded during

2005. These higher water tables prevented farm activities in wetland basins and excellent residual nesting cover remained around the potholes. Excellent conditions prevailed where these

wetlands were associated with natural grasslands. The south western corner of Manitoba saw a substantial drop off of precipitation compared to further northeast. Precipitation levels of winter snow and spring rains were virtually nonexistent and pothole numbers appeared less than in 2005. Conditions here have prevailed for the last 2 -3 years and habitat would be considered poor for nesting waterfowl.

In the west central portion of the Province (Strata 25, 36 and 37) conditions were notably drier, but still appeared better than in the previous 3 – 4 years. Strata 36 and 37 received substantially less rainfall and are drier than further south, but nesting cover still was better than average. Strata 25, i.e., the Saskatchewan River area had higher than average water levels which may be a mixed blessing for the breeding waterfowl of the area. We observed more diver numbers, but fewer dabbling numbers in the area. Conditions appeared good to excellent for divers, but the higher water probably prevented high densities of dabblers from successfully breeding.

Pond Estimates

The 2006 pond estimate of 734,800 is - 2.7 % less than in 2005 (Table 2). Significant precipitation was received during fall 2005 in many areas of the Province which substantially increased the availability of wetland habitat. Warm winter temperatures and less than average snowfall (in some areas) had mixed value to 2006 wetlands. In many areas we recorded water levels above residual vegetation and in agricultural areas where the only nesting habitat was the fallow field surrounding the wetland in 2005. The substantial increase in water levels should have a significant impact on the water “recharge” to existing permanent and semi-permanent wetlands for the future. On the positive side pond estimates for May 2006 were 17.3 % and 9.2 % more than the 10-year mean and LTM, respectively.

BREEDING POPULATION ESTIMATES:

The 2006 breeding waterfowl population data are listed by strata and species in Table 1. Total duck populations for southern Manitoba were 10.4 % higher than 2005, 7.8 % above the 10-year mean, but – 0.7 % below the LTM. A comparison of duck populations for each stratum and each species is, also found in Table 1. The long term trend of duck population estimates by year (1955 to 2006) is found in Appendix 1.

Dabbling Ducks (Table 1.)

Dabbling duck populations were 7.6 % higher than 2005, 10.4 % higher than the 10-year mean and 0.4 % higher than the LTM. Dabbling ducks made up 72.4 % of all ducks counted in the survey area. More than 2 million ducks were estimated in Southern Manitoba and mallard comprised 27 %, blue-winged teal 22.1 %, shoveler 9.1 %, and gadwall 6.3 %. All dabbling species indicated higher estimates than 2005 except American wigeon, shoveler, and Northern Pintail. Northern Pintail estimates were – 14.6 %, -3.3 %, and -53.8 % lower than in 2005, the 10 year-mean, and the LTM respectively. Species with estimates above the LTM included mallard at 9.9 % higher, gadwall at 64.3 % higher, American green-winged teal at 25.1 % higher, and shoveler 44.5 % higher. Wigeon indicated the greatest decline over the LTM at - 81.2 %.

Diving Ducks (Table 1.)

Diving ducks were 15.6 % higher than in 2005, - 0.1 % lower than the 10-year mean, and - 6.3% lower than the LTM. This category made up 25.6 % of all ducks in the survey area. Scaups accounted for 28.5 % of all divers. Those species which indicated positive increase over 2005 were: canvasback 63.1 %, scaups 47.9 %, ruddy duck 3.3 %, redhead 2.9 %, and ring-necked duck 2.2 %. Significant decreases occurred to the following species in the diving duck category compared to 2005; goldeneye – 29.9 %, and bufflehead – 12.9%.

CONCLUSIONS AND OBSERVATIONS:

May, 2006 began as a promising month for waterfowl with positive indications of better or at least as good water levels as in 2005 and the possibility of more breeding ducks. As the month progressed, however, water levels stabilized and prospects for an outstanding year turned to average.

As in 2005 some sections of the survey area had noticeable increase in sheet water, flooded pastures and rising water levels in rivers, i.e., Stratum 38 and eastern portions of 39. Again this year the core areas of the parklands and the scattered islands of excellent wetland complexes indicated a significant increase in quality wetland habitat and resultant increase in duck numbers, especially in Stratum 40. Overall, the May breeding season appeared to have a positive impact on breeding birds and will have positive wetland gains for the year to come.

ACKNOWLEDGMENTS:

Thanks to the staff at Maple Leaf Aviation, Brandon, Manitoba, especially Dave and Jim Wall for their continued excellent maintenance and care of N728, their friendship, advice and local weather knowledge.

Submitted by: Rodney J. King, Flyway Biologist, DMBM, Mare Island, CA

Table 1. Status of waterfowl breeding population estimates (thousands, adjusted for visibility bias) by species and stratum with comparisons against the previous year, the previous 10-year mean, and the long-term mean for Southern Manitoba.

Species/Ponds	Stratum (2006)						2006 Total	2005 Total	10-Year Mean	Long-Term Mean	% Change From		
	25	36	37	38	39	40					2005	10-Year Mean	Long-Term Mean
Ducks													
Dabblers													
Mallard	30.1	13.8	138.5	73.6	147.9	137.5	541.4	481.4	492.4	492.8	12.5%	9.9%	9.9%
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	--	-100.0%	-100.0%
Gadwall	1.0	0.8	11.9	1.4	62.1	49.0	126.2	122.0	115.4	76.8	3.4%	9.4%	64.3%
Am. wigeon	1.3	1.6	2.5	0.6	6.0	5.5	17.5	37.7	33.8	93.4	-53.4%	-48.1%	-81.2%
Am. green-winged teal	12.9	7.1	12.3	10.6	21.8	13.6	78.3	61.1	58.4	62.6	28.3%	34.0%	25.1%
Blue-winged teal	17.4	5.6	72.0	32.7	210.2	105.1	443.0	355.7	383.2	462.5	24.6%	15.6%	-4.2%
N. shoveler	5.3	2.3	26.3	22.2	86.2	40.7	183.1	219.8	167.2	126.7	-16.7%	9.5%	44.5%
N. pintail	1.4	0.0	4.3	6.3	35.6	11.1	58.7	68.7	60.7	127.2	-14.6%	-3.3%	-53.8%
Subtotal	69.3	31.3	267.9	147.3	569.9	362.4	1448.2	1346.4	1311.7	1442.4	7.6%	10.4%	0.4%
Divers													
Redhead	4.8	0.0	22.8	2.3	28.9	47.8	106.6	103.6	106.9	88.1	2.9%	-0.3%	21.1%
Canvasback	11.0	0.3	41.4	0.4	15.7	29.7	98.5	60.4	84.8	81.1	63.1%	16.1%	21.5%
Scaups	49.1	6.3	19.9	0.2	46.2	24.3	146.0	98.7	100.0	197.9	47.9%	46.0%	-26.3%
Ring-necked duck	5.1	0.7	6.8	0.3	8.4	10.3	31.6	30.9	53.9	46.1	2.2%	-41.4%	-31.4%
Goldeneyes	16.5	0.8	8.9	0.0	0.4	3.8	30.4	43.4	50.9	35.1	-29.9%	-40.3%	-13.3%
Bufflehead	5.8	7.4	23.9	0.0	0.8	17.7	55.5	63.8	50.8	33.2	-12.9%	9.3%	67.2%
Ruddy Duck	2.9	0.0	7.7	0.3	13.3	19.4	43.6	42.2	65.2	65.4	3.3%	-33.2%	-33.3%
Subtotal	95.1	15.5	131.4	3.4	113.7	153.1	512.2	443.0	512.6	546.8	15.6%	-0.1%	-6.3%
Miscellaneous													
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	--	-100.0%	-100.0%
Eiders	0.8	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	--	--	--
Scoters	1.7	0.0	0.9	0.0	0.0	0.0	2.7	3.6	1.6	3.5	-25.6%	62.6%	-24.4%
Mergansers	19.5	6.4	10.4	0.0	0.0	1.1	37.5	20.2	30.0	22.8	85.0%	25.0%	64.3%
Subtotal	22.0	6.4	11.4	0.0	0.0	1.1	40.9	23.8	31.7	26.4	71.8%	29.2%	55.2%
Total Ducks	186.5	53.2	410.6	150.8	683.5	516.7	2001.3	1813.2	1856.0	2015.6	10.4%	7.8%	-0.7%
Canada Goose	12.9	7.7	62.3	7.7	17.4	42.5	150.4	65.1	75.2	39.2	131.0%	100.0%	283.7%
Am. coot	2.6	0.2	5.8	2.5	65.1	30.0	106.3	184.6	290.2	212.2	-42.4%	-63.4%	-49.9%
Ponds		77.0	262.5	59.1	185.9	150.3	734.8	755.2	626.6	673.0	-2.7%	17.3%	9.2%

Table 2. Long-term trend in adjusted May pond estimates (thousands) by stratum with comparisons against the previous year, the previous 10-year mean, and the long-term mean for Southern Manitoba. Note that ponds are not counted in stratum 25.

Year	25	36	37	38	39	40	Total
1961		33.1	289.8	36.3	117.7	109.6	586.6
1962		25.2	313.5	31.9	74.8	88.2	533.6
1963		47.8	247.7	53.2	162.5	168.8	679.9
1964		77.4	289.6	38.6	253.2	250.3	909.1
1965		141.8	443.8	72.6	246.0	218.4	1122.6
1966		115.8	433.2	62.8	242.0	212.4	1066.3
1967		129.0	503.3	70.1	182.7	234.9	1120.0
1968		39.8	153.9	27.4	46.3	67.9	335.3
1969		59.6	153.1	36.8	126.3	87.3	463.1
1970		79.4	368.2	63.1	262.2	262.2	1035.2
1971		69.9	239.9	60.5	200.7	183.5	754.6
1972		103.8	431.5	48.1	180.4	250.0	1013.7
1973		82.6	137.6	33.6	97.7	82.4	433.9
1974		141.7	559.5	67.2	324.6	356.2	1449.1
1975		59.7	264.2	53.3	296.2	264.1	937.6
1976		75.5	444.0	61.7	376.4	231.0	1188.7
1977		35.6	208.2	39.2	67.0	90.0	439.9
1978		129.9	312.5	31.7	114.9	191.3	780.3
1979		67.6	268.5	42.1	202.5	211.7	792.4
1980		32.4	103.2	31.6	58.5	60.9	286.7
1981		30.4	107.8	23.1	47.5	54.0	262.8
1982		27.0	131.1	25.3	88.2	87.4	359.0
1983		89.2	271.7	34.3	163.3	153.9	712.4
1984		69.3	159.1	36.5	86.3	58.2	409.4
1985		45.4	234.6	29.0	83.7	103.6	496.3
1986		94.3	383.8	70.2	197.1	202.2	947.5
1987		42.1	165.2	37.6	119.4	133.8	498.1
1988		108.2	318.5	43.4	48.8	113.6	632.5
1989		36.6	99.1	38.2	63.5	46.8	284.2
1990		80.7	348.5	35.7	52.4	145.2	662.4
1991		28.8	147.1	32.4	70.8	114.0	393.1
1992		61.9	261.9	54.0	150.3	136.6	664.8
1993		48.3	216.8	55.7	63.4	99.2	483.4
1994		45.8	157.9	37.0	89.4	65.6	395.7
1995		79.7	332.1	65.2	239.5	172.9	889.4
1996		76.9	371.2	54.5	177.2	150.1	829.8
1997		99.9	467.5	84.5	157.4	159.2	968.5
1998		43.0	194.9	44.3	124.1	85.7	492.1
1999		36.8	185.6	32.6	204.6	151.1	610.7
2000		45.6	184.0	27.5	91.3	117.3	465.7
2001		31.1	324.7	122.9	144.0	163.1	785.8
2002		64.4	77.8	45.8	52.0	87.2	327.2
2003		44.0	143.1	59.6	140.3	103.9	490.9
2004		47.0	219.9	32.3	126.8	114.5	540.6
2005		56.8	312.4	38.4	139.3	208.3	755.2
2006		77.0	262.5	59.1	185.9	150.3	734.8
10-year Mean		54.5	248.1	54.3	135.7	134.0	626.6
Long-term Mean		66.2	266.3	47.2	145.6	147.7	673.0
Percent Change:							
From 2005		35.6%	-16.0%	53.8%	33.5%	-27.8%	-2.7%
From 10-year Mean		41.2%	5.8%	8.9%	37.0%	12.1%	17.3%
From Long-term Mean		16.3%	-1.4%	25.3%	27.7%	1.7%	9.2%

Appendix 1. Long-term trend in adjusted waterfowl breeding population estimates (thousands).

Species/Ponds	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Ducks										
Dabblers										
Mallard	549.9	811.4	852.4	1116.6	702.5	647.2	442.6	292.5	428.6	534.7
Am. black duck	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.5	2.1	0.5
Gadwall	31.4	18.9	23.6	34.1	35.5	28.0	62.2	41.2	84.3	70.7
Am. wigeon	162.3	140.2	120.8	392.7	292.2	106.4	130.4	100.1	118.4	166.3
Am. green-winged teal	36.9	17.8	29.6	74.7	57.1	21.7	67.3	21.0	69.3	10.7
Blue-winged teal	514.8	313.3	399.1	1198.2	1302.2	729.2	543.5	439.2	538.4	490.9
N. shoveler	57.4	66.5	93.4	84.3	198.3	158.0	138.1	75.9	159.9	167.8
N. pintail	335.1	296.2	210.4	208.6	149.0	256.7	115.3	122.5	196.4	141.6
Subtotal	1687.9	1665.1	1729.1	3109.1	2736.7	1947.1	1499.4	1093.0	1597.3	1583.2
Divers										
Redhead	66.3	69.9	55.2	99.1	123.7	88.6	77.7	50.6	105.7	117.9
Canvasback	80.5	79.6	54.4	138.3	109.0	131.3	123.1	58.3	100.6	101.3
Scaups	225.3	235.3	281.6	598.0	416.6	289.1	271.1	184.3	269.5	218.6
Ring-necked duck	27.2	25.3	7.0	18.4	55.7	13.0	17.7	21.2	46.2	24.1
Goldeneyes	17.8	13.3	17.5	34.6	87.7	53.9	25.4	29.0	16.4	10.6
Bufflehead	16.3	7.5	2.9	10.9	14.7	9.6	23.1	7.8	20.6	14.3
Ruddy Duck	28.9	28.6	24.9	24.6	81.3	62.5	95.3	55.0	106.2	74.9
Subtotal	462.3	459.7	443.4	923.9	888.8	648.0	633.4	406.2	665.3	561.7
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	3.4	7.5	0.9	10.3	10.1	0.0	1.6	0.5	1.4	2.2
Mergansers	14.2	2.6	0.6	1.2	1.6	5.0	1.9	4.7	8.7	19.3
Subtotal	17.6	10.1	1.6	11.4	11.7	5.0	3.5	5.3	10.1	21.6
Total Ducks	2167.8	2134.9	2174.1	4044.4	3637.1	2600.2	2136.3	1504.5	2272.7	2166.4
Canada Goose	5.6	31.5	0.0	8.8	3.5	9.5	7.4	11.0	9.0	8.4
Am. coot	18.8	45.7	27.8	77.0	286.6	121.5	239.7	52.0	112.5	117.2
Ponds							586.6	533.6	679.9	909.1
<hr/>										
Species/Ponds	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Ducks										
Dabblers										
Mallard	372.0	431.5	468.3	435.1	659.7	757.2	458.3	576.6	370.1	421.0
Am. black duck	0.1	0.4	1.1	1.6	0.2	0.2	0.3	0.0	0.0	0.0
Gadwall	54.5	86.6	98.0	71.0	58.5	59.8	51.8	86.5	86.9	58.1
Am. wigeon	177.0	130.4	96.3	144.5	173.5	155.3	112.6	150.9	163.6	108.3
Am. green-winged teal	39.4	60.9	83.2	58.5	174.8	92.3	135.1	125.7	134.1	112.9
Blue-winged teal	360.5	285.1	679.3	496.9	575.5	819.4	450.0	533.6	478.7	703.6
N. shoveler	141.0	135.7	202.1	99.1	172.7	147.0	93.1	146.3	76.8	106.1
N. pintail	145.5	110.0	180.5	82.5	311.3	276.2	169.0	227.8	95.6	310.5
Subtotal	1290.0	1240.6	1808.8	1389.2	2126.2	2307.4	1470.1	1847.4	1405.8	1820.5
Divers										
Redhead	175.4	106.2	113.2	72.9	85.9	101.0	82.7	75.8	76.7	91.8
Canvasback	126.7	93.3	109.4	80.2	73.8	71.2	80.2	42.8	68.4	40.7
Scaups	205.4	183.1	246.9	188.3	158.9	227.1	188.2	191.3	138.2	348.4
Ring-necked duck	31.6	35.8	53.9	97.3	35.5	53.5	72.3	47.4	29.8	54.6
Goldeneyes	16.9	7.6	19.6	9.5	17.5	23.6	39.2	16.0	15.6	34.7
Bufflehead	21.3	19.2	49.1	25.7	34.5	21.4	31.2	28.6	11.3	27.6
Ruddy Duck	76.2	102.3	82.5	131.2	58.0	69.5	59.8	34.5	49.7	62.8
Subtotal	653.4	547.5	674.6	605.1	464.2	567.4	553.5	436.4	389.7	660.6
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	2.2	5.7	3.0	9.1	1.3	5.3	6.1	1.7	5.6	17.4
Mergansers	15.0	22.9	7.0	12.4	15.0	11.2	7.4	16.6	13.0	27.3
Subtotal	17.2	28.7	10.0	21.7	16.4	16.5	13.5	18.3	18.5	44.7
Total Ducks	1960.6	1816.7	2493.4	2016.0	2606.7	2891.4	2037.1	2302.0	1814.1	2525.7
Canada Goose	8.1	9.7	4.4	21.0	17.1	21.0	25.1	22.2	30.4	22.3
Am. coot	121.0	62.5	150.3	433.8	139.3	184.2	148.0	172.8	127.3	242.4
Ponds	1122.6	1066.3	1120.0	335.3	463.1	1035.2	754.6	1013.7	433.9	1449.1

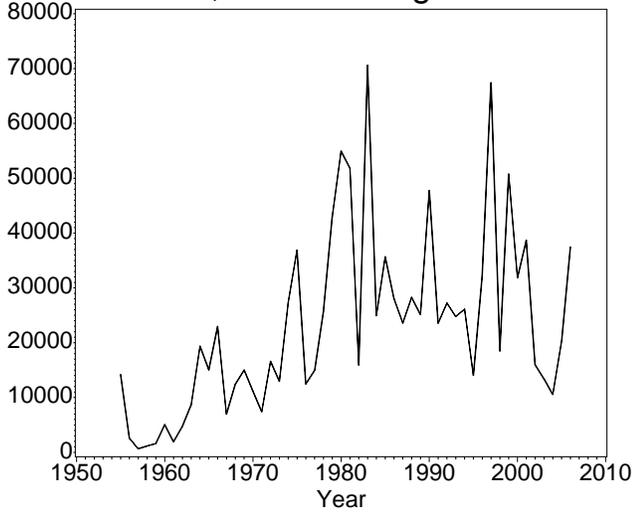
Appendix 1 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands).

Species/Ponds	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Ducks										
Dabblers										
Mallard	476.5	679.8	482.8	429.9	417.1	596.2	467.5	521.2	427.7	233.4
Am. black duck	0.5	0.5	0.9	0.4	0.6	1.2	0.0	0.0	0.0	0.0
Gadwall	52.5	62.2	81.8	61.7	81.0	144.5	70.7	58.3	52.6	17.3
Am. wigeon	77.6	78.6	41.7	73.2	82.4	121.1	103.9	67.0	48.4	38.5
Am. green-winged teal	66.0	122.5	70.3	141.2	40.1	35.9	40.7	36.2	52.9	43.2
Blue-winged teal	410.2	722.5	435.8	383.6	536.8	528.0	386.0	496.2	314.3	201.6
N. shoveler	69.3	166.3	62.1	89.6	95.2	75.8	116.1	157.8	135.5	65.3
N. pintail	225.9	263.5	43.1	107.1	201.2	73.6	71.6	110.5	106.2	31.8
Subtotal	1378.5	2095.9	1218.6	1286.6	1454.5	1576.2	1256.6	1447.1	1137.7	631.1
Divers										
Redhead	82.7	86.2	108.8	80.6	76.5	65.4	150.9	94.8	60.5	20.1
Canvasback	90.9	127.4	74.3	57.7	60.9	75.9	101.1	65.5	48.0	56.2
Scaups	312.0	267.9	164.6	307.2	149.8	222.0	249.1	169.3	243.5	120.2
Ring-necked duck	59.7	21.8	14.6	35.8	44.6	88.3	87.8	47.6	50.0	17.5
Goldeneyes	43.7	42.5	14.4	78.2	39.9	33.2	85.9	41.9	42.8	7.4
Bufflehead	29.6	42.8	32.5	45.9	20.3	33.0	35.6	30.3	32.8	26.5
Ruddy Duck	52.6	45.7	40.2	56.3	23.3	104.7	117.0	161.8	60.6	38.9
Subtotal	671.2	634.3	449.4	661.6	415.4	622.6	827.3	611.0	538.2	286.8
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	12.1	6.1	4.2	4.1	9.0	0.8	1.0	1.5	6.0	1.5
Mergansers	36.8	12.5	15.0	25.7	43.0	54.9	51.9	15.9	70.6	24.9
Subtotal	49.0	18.6	19.1	29.8	52.0	55.8	52.9	17.5	76.6	26.4
Total Ducks	2098.7	2748.8	1687.1	1978.1	1921.8	2254.5	2136.8	2075.7	1752.4	944.3
Canada Goose	20.9	9.3	24.3	27.5	25.7	39.5	35.8	31.9	47.1	40.2
Am. coot	312.5	485.5	267.4	128.0	196.3	499.7	404.2	197.7	135.2	55.6
Ponds	937.6	1188.7	439.9	780.3	792.4	286.7	262.8	359.0	712.4	409.4
<hr/>										
Species/Ponds	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Ducks										
Dabblers										
Mallard	329.2	431.8	332.0	340.4	315.3	363.1	340.6	389.4	354.7	436.5
Am. black duck	0.6	0.8	0.7	0.2	0.2	0.2	0.4	1.1	0.0	0.3
Gadwall	64.3	105.7	71.2	70.3	69.6	120.1	79.7	111.9	94.4	57.6
Am. wigeon	53.5	63.4	39.5	43.6	56.1	58.1	55.0	52.5	31.9	47.3
Am. green-winged teal	24.2	55.4	46.2	38.3	40.4	41.2	39.3	138.5	24.5	32.1
Blue-winged teal	225.2	386.0	291.5	369.0	314.5	343.1	272.2	430.4	355.6	172.2
N. shoveler	99.9	165.5	115.6	122.8	79.2	95.2	88.9	151.3	79.5	64.8
N. pintail	45.8	124.0	77.9	36.4	19.6	57.4	26.6	100.2	40.5	52.5
Subtotal	842.6	1332.5	974.5	1021.0	894.9	1078.4	902.6	1375.3	981.1	863.3
Divers										
Redhead	51.3	38.3	52.2	53.6	33.5	85.0	99.9	116.3	44.2	51.2
Canvasback	60.4	57.1	42.5	56.0	53.4	68.5	65.3	80.0	69.5	100.2
Scaups	155.6	309.1	169.5	151.1	101.9	152.9	101.4	221.2	123.0	154.7
Ring-necked duck	42.7	34.5	55.5	57.2	33.8	49.3	47.4	113.8	52.6	42.2
Goldeneyes	66.7	22.8	33.8	34.5	21.1	40.6	15.0	36.1	24.8	6.5
Bufflehead	41.7	31.9	40.3	33.1	33.8	35.6	48.2	67.2	28.0	49.1
Ruddy Duck	44.5	69.9	81.0	68.1	57.9	72.7	80.5	60.8	74.6	15.1
Subtotal	462.8	563.7	474.8	453.7	335.4	504.6	457.6	695.5	416.5	419.0
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.3
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scoters	3.6	0.3	1.6	3.4	0.2	0.3	1.8	4.8	3.0	1.5
Mergansers	35.6	28.0	23.6	28.3	25.1	47.8	23.6	27.2	24.8	26.1
Subtotal	39.2	28.3	25.2	31.6	25.3	48.1	25.3	32.0	28.3	28.8
Total Ducks	1344.7	1924.5	1474.5	1506.3	1255.6	1631.2	1385.6	2102.8	1426.0	1311.1
Canada Goose	43.2	45.2	38.5	74.6	97.0	52.9	61.1	67.2	74.4	52.6
Am. coot	78.7	217.9	163.2	773.9	129.8	180.3	129.1	266.0	173.5	44.6
Ponds	496.3	947.5	498.1	632.5	284.2	662.4	393.1	664.8	483.4	395.7

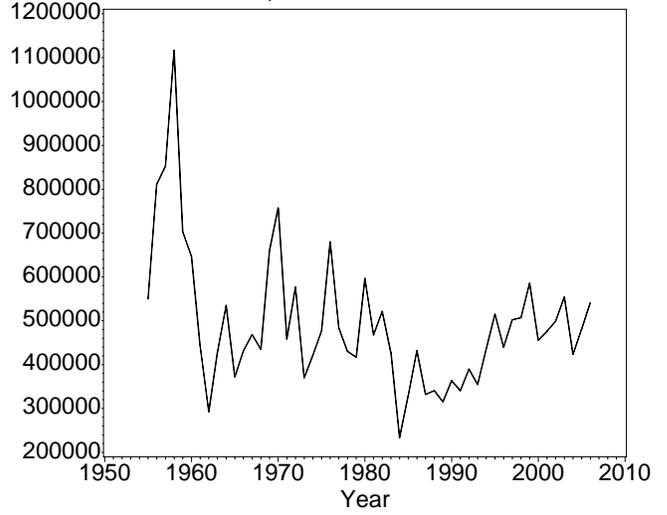
Table 3. Survey design for Southern Manitoba and the Saskatchewan River Delta, May, 2005.

Survey Design	Stratum						Total
	25	36	37	38	39	40	
Sq. Mi. in stratum	7,644	5,500	16,485	5,655	6,552	4,536	46,372
Sq. Mi. in sample	135	58.5	135.0	54.0	121.5	67.5	571.5
Linear Mi. in sample	540	234	540	216	486	270	2,286
No. of transects in sample	5	3	4	3	5	4	24
No. of segments in sample	28	11	30	12	27	15	124
Expansion factor	58.57	111.11	122.111	104.722	53.93	67.20	

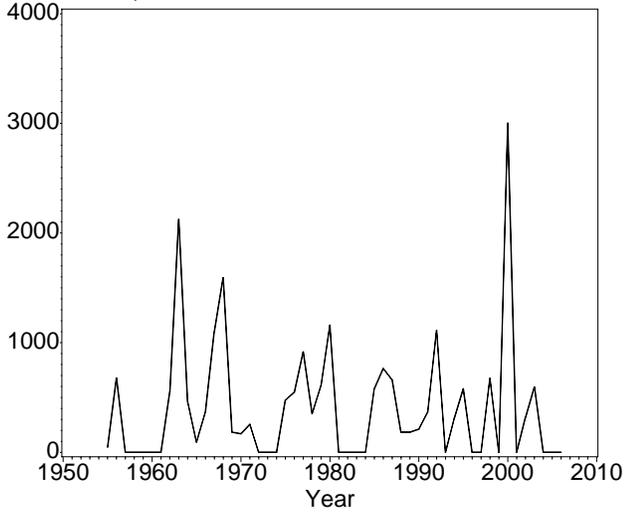
Strata 25, 36-40 Mergansers



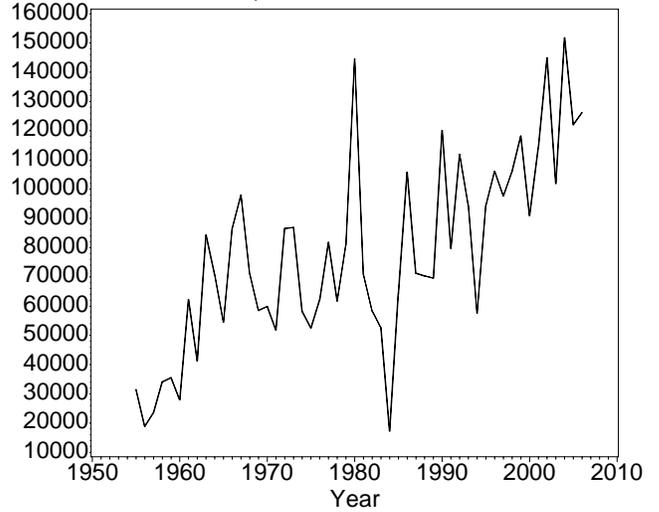
Strata 25, 36-40 Mallard



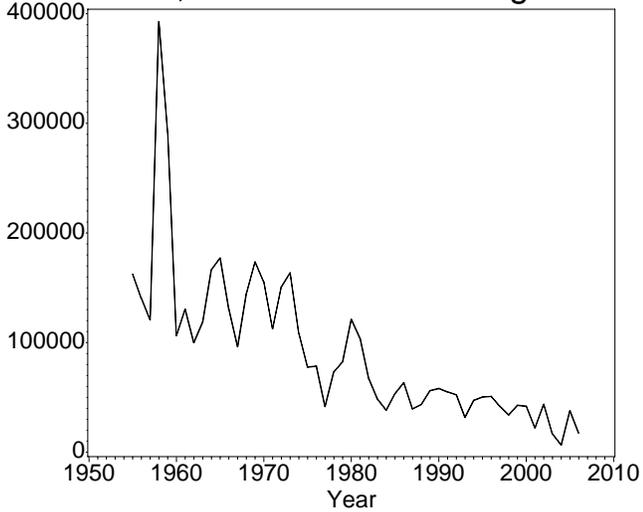
Strata 25, 36-40 American black duck



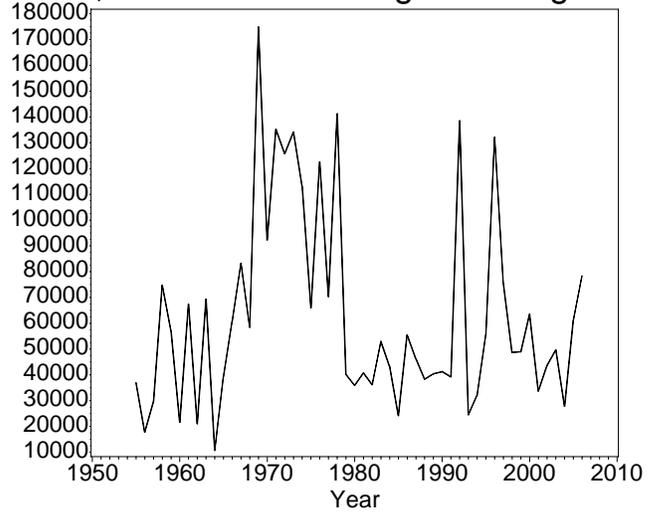
Strata 25, 36-40 Gadwall



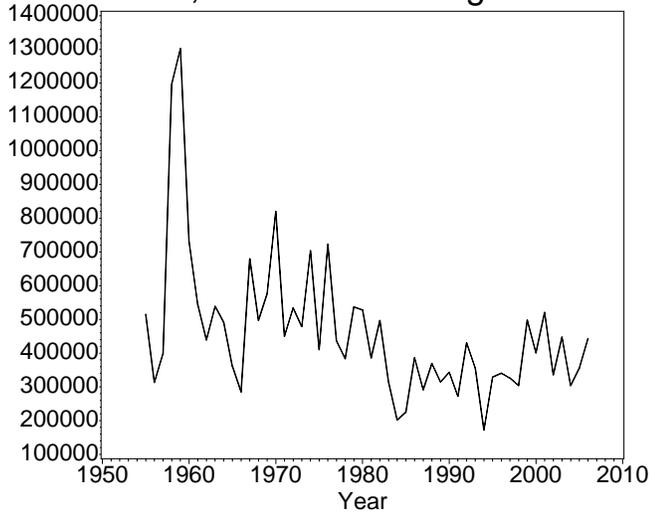
Strata 25, 36-40 American wigeon



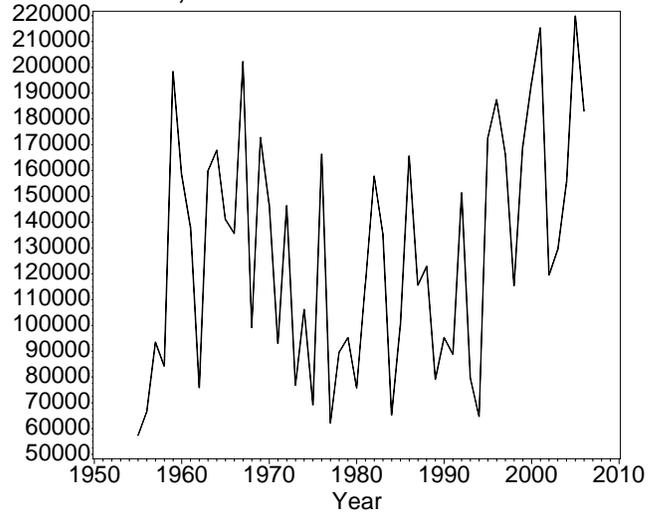
Strata 25, 36-40 American green-winged teal



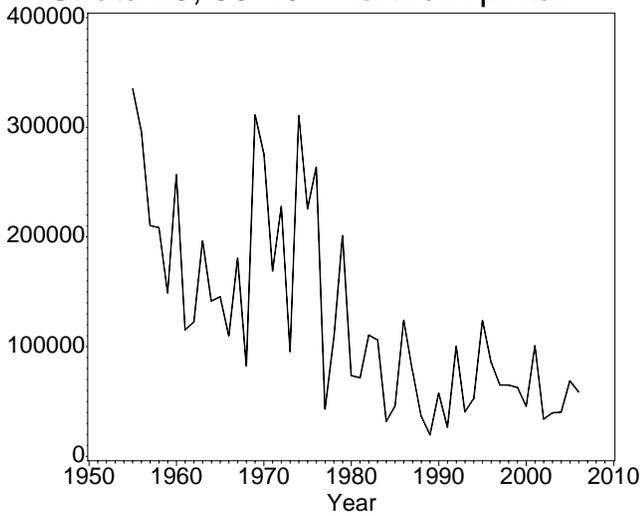
Strata 25, 36-40 Blue-winged teal



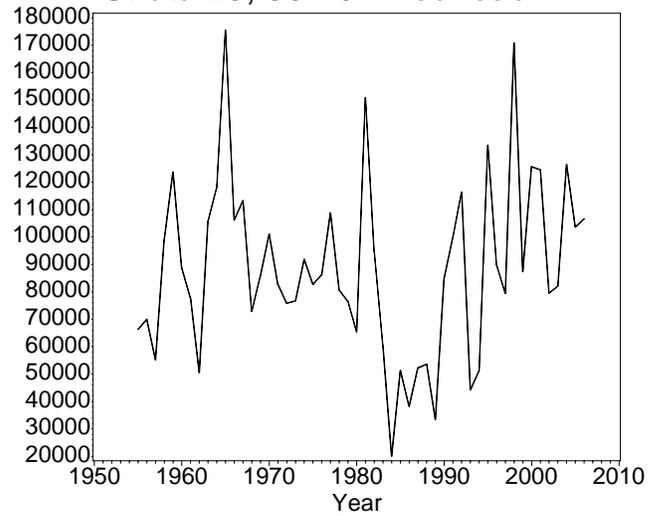
Strata 25, 36-40 Northern shoveler



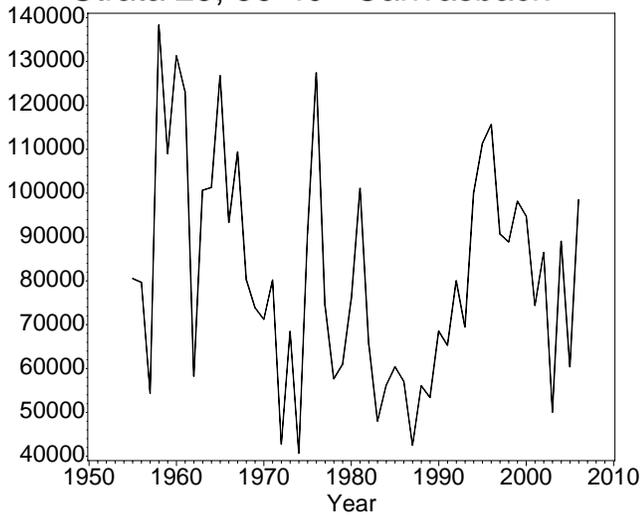
Strata 25, 36-40 Northern pintail



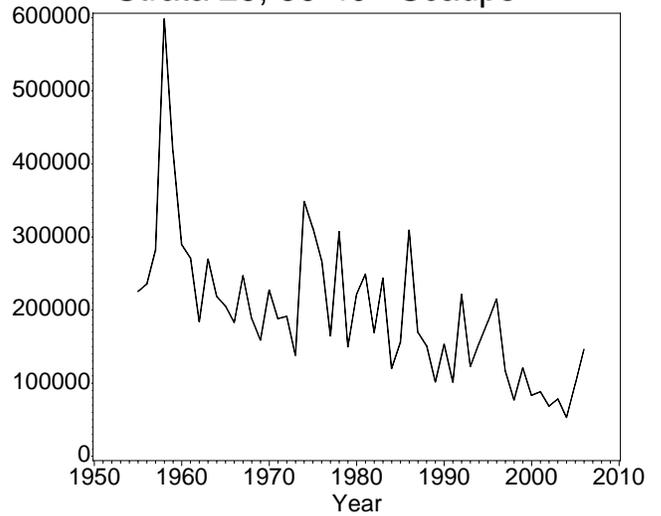
Strata 25, 36-40 Redhead



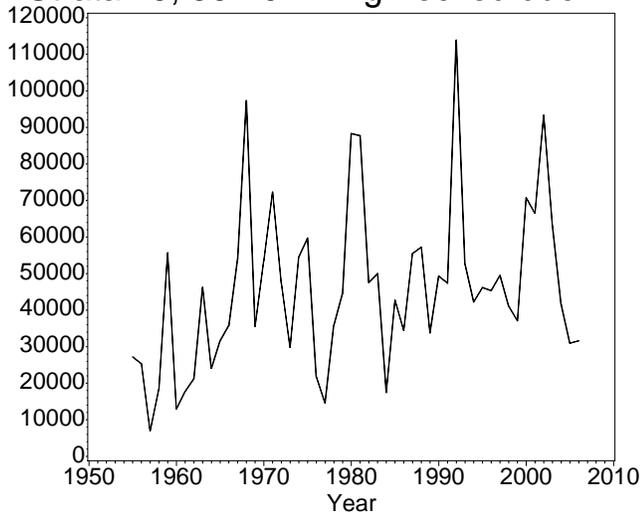
Strata 25, 36-40 Canvasback



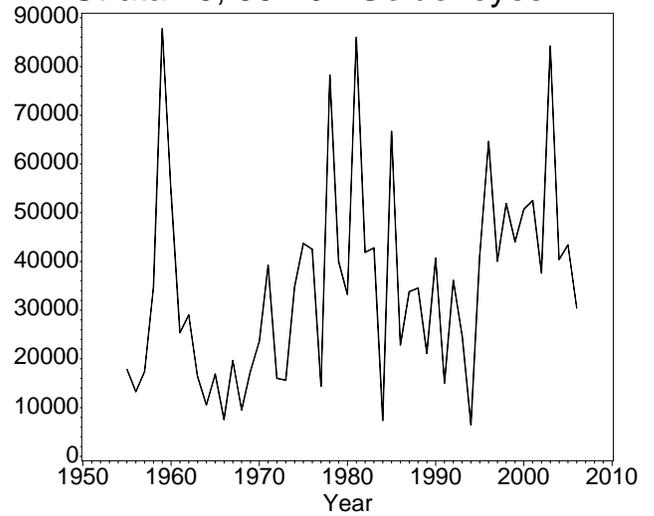
Strata 25, 36-40 Scaups



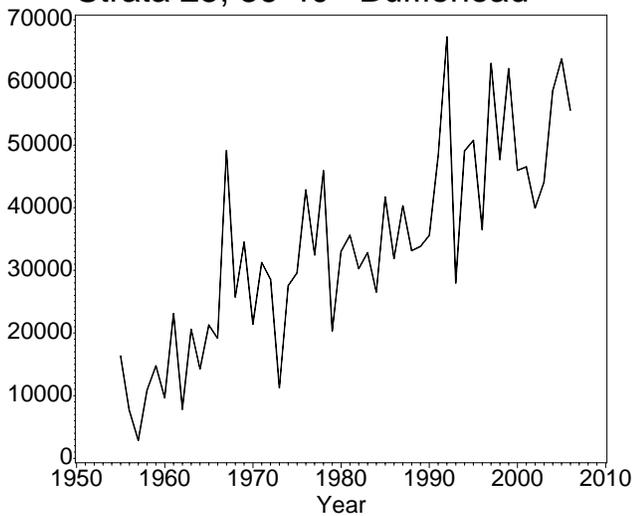
Strata 25, 36-40 Ring-necked duck



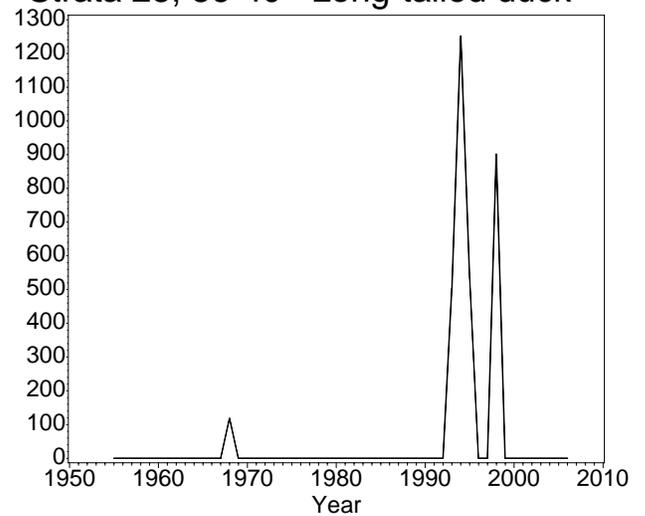
Strata 25, 36-40 Goldeneyes



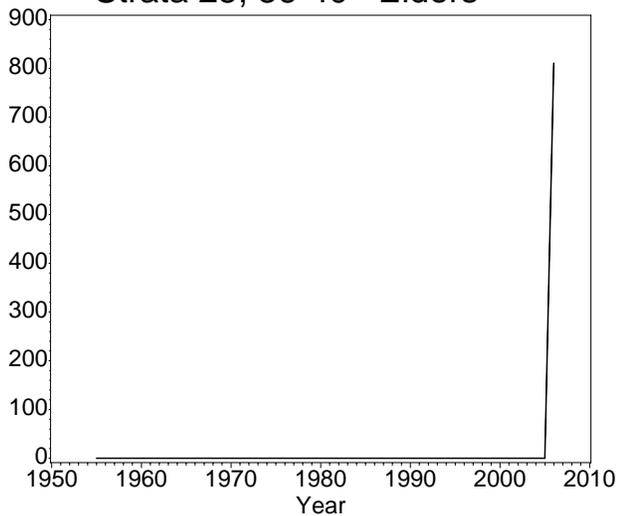
Strata 25, 36-40 Bufflehead



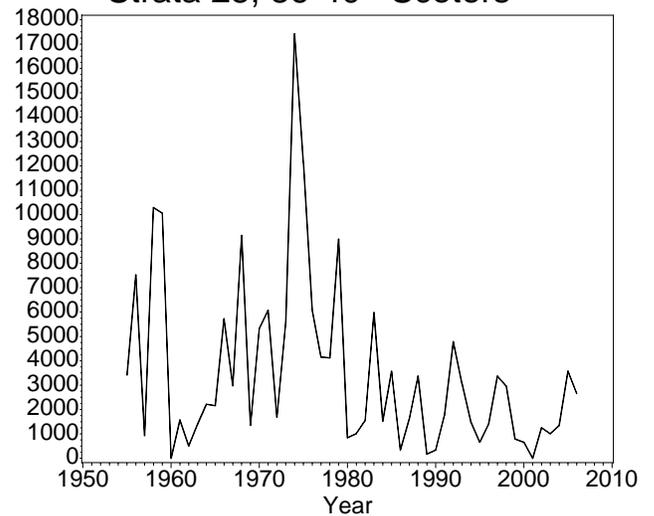
Strata 25, 36-40 Long-tailed duck



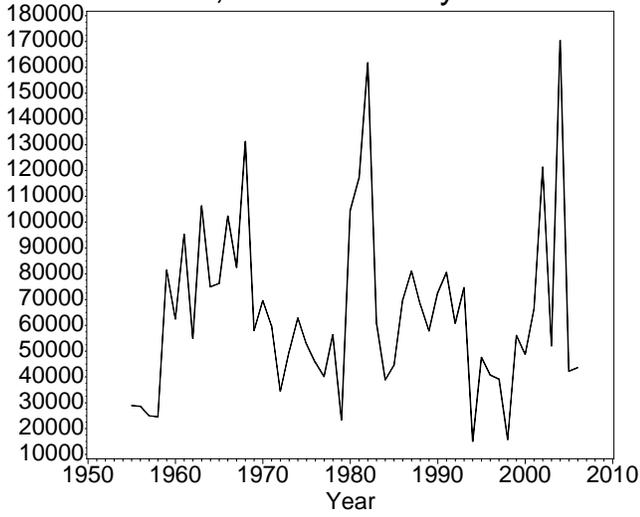
Strata 25, 36-40 Eiders



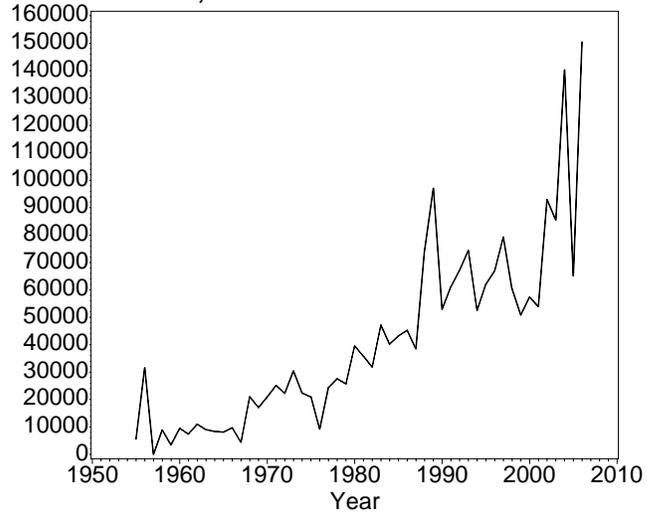
Strata 25, 36-40 Scoters



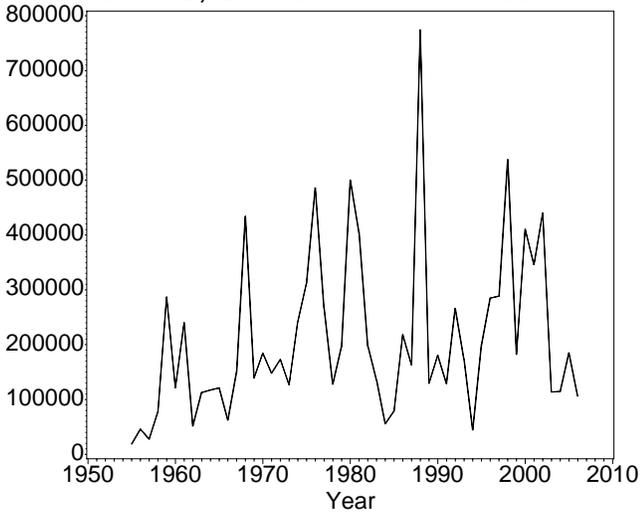
Strata 25, 36-40 Ruddy Duck



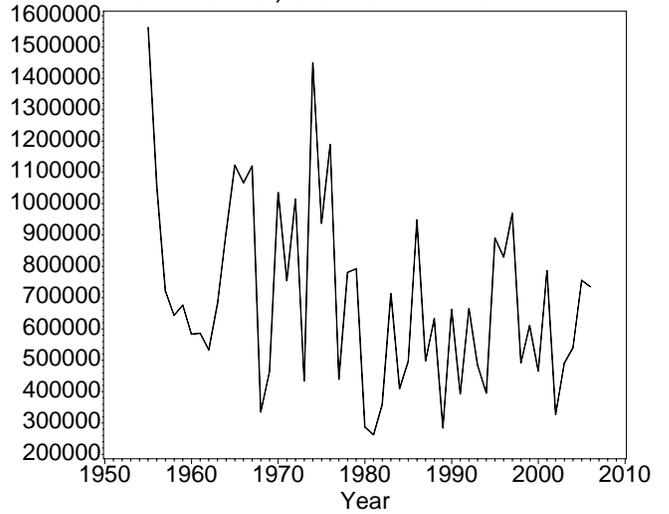
Strata 25, 36-40 Canada Goose



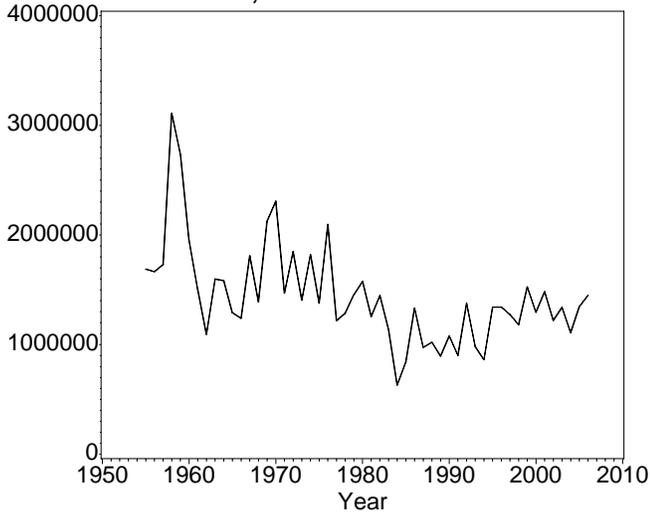
Strata 25, 36-40 American coot



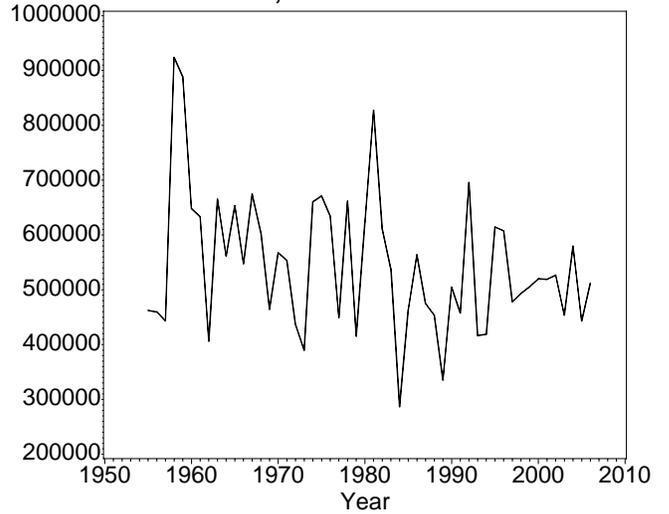
Strata 25, 36-40 Ponds



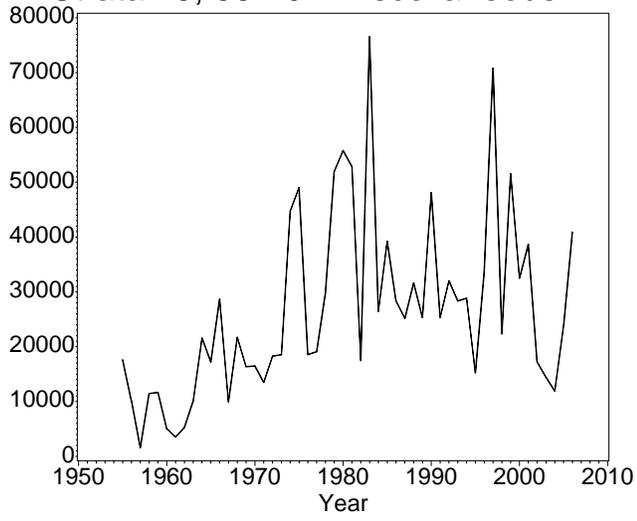
Strata 25, 36-40 Dabblers



Strata 25, 36-40 Divers



Strata 25, 36-40 Miscellaneous



Strata 25, 36-40 Total Ducks

