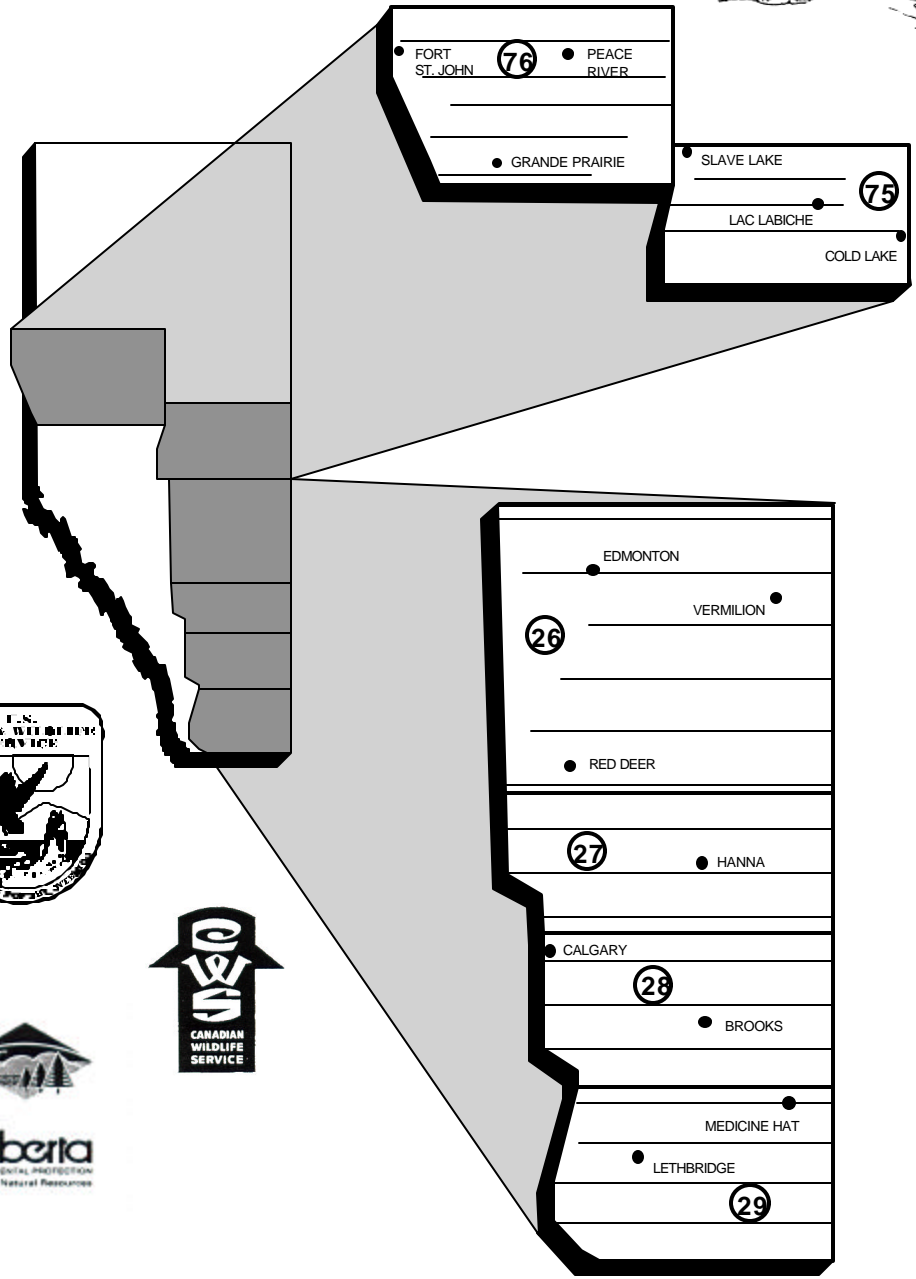


WATERFOWL BREEDING POPULATION SURVEY

SOUTHERN AND CENTRAL ALBERTA

MAY 2008



Alberta
ENVIRONMENTAL PROTECTION
Natural Resources

TITLE Waterfowl Breeding Population and Habitat Survey for Southern and Central Alberta

STRATA SURVEYED 26, 27, 28, 29, 75, 76

DATES May 7-25, 2008

DATA SUPPLIED BY United States Fish and Wildlife Service (USFWS)
Canadian Wildlife Service (CWS)
Alberta Environmental Protection/Wildlife
Management Division (AEP)
Ducks Unlimited, Canada (DUC)

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ABSTRACT

The 2008 Waterfowl Breeding Population and Habitat Survey of Southern and Central Alberta was conducted from 7-25 May and was consistent in design and coverage to previous surveys. Overall, habitat conditions for breeding waterfowl in 2008 were generally worse than conditions in 2007 in Prairie Alberta and similar to last year in the Parklands. The total pond estimate was 848,700 ponds in Southern Alberta. This was decline of 30.7% below last year's estimate of 1,225,400 ponds but remained 14.9% above the long- term average. The total pond estimate for Central Alberta was 584,500 ponds. This was a decline of 10% from last year's estimate of 649,100 ponds and an increase of 17.1% from the long- term average. The estimate of total ducks from the 2008 Waterfowl Breeding Population and Habitat Survey for strata 26-29 (Southern Alberta) was 4,207,200, which is a 2.1% decline from last year's estimate of 4,295,900 , a 30.7% increase from the 10- year mean and a 2.3 % decline from the 1955-2007 average. Mallard (*Anas platyrhynchos*) abundance was 875,200 birds which was 5.4% above last years estimate of 830,200, 9.7% above the 10- year mean and 19.7% below the long- term mean. Blue-winged teal (*A. discors*) estimated abundance was 817,700 birds which were the 4th highest since 1955, 22.3% greater than last years estimate of 668,500,

64.6% above the 10- year mean and 33.1% above the long- term mean. Estimates for northern pintails (*Anas acuta*) were 240,000 birds which is a 26% decline from last year, a 7.2% increase from the 10-year mean and a 66.3% decline from the long- term mean. The estimate of total ducks from the 2008 Waterfowl Breeding Population and Habitat Survey for strata 75-76 (Central Alberta) was 1,565,700 which is an 8.9% decline from last year's estimate of 1,719,200, a 3.6% decline from the long- term mean and a 4.3 % increase from the 1955-2007 average. Mallard (*Anas platyrhynchos*) abundance was 359,400 birds which was 10.6% above last years estimate of 324,900, a decline of 15.1% from the 10- year mean and 11.6% below the long- term mean. Blue-winged teal (*A. discors*) estimated abundance was 198,600 birds which was 25.5% below last years estimate of 266,600 birds, 5.2% above the 10- year mean and 25.7% above the long- term mean. Estimates for northern pintails (*anas acuta*) was 18,800 birds which was a 66.6% decline from last year, a 9.5% decline from the 10- year mean and a 11.6% decline from the long-term mean. Poor to fair production is expected in the Prairies and fair production is expected in the Parklands of Alberta this year.

METHODS

The procedures followed in conducting the survey are contained in the Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys, Section III, revised April 1987. The analytical and procedural changes, initiated and described in the 1991 and 1992 reports, continued through 2008. As a result, measures of precision are now available with the population estimates. Reports generated during the most recent ten years reports reflect major changes in the historical (1955-1995) database of breeding waterfowl and habitat estimates. Nonparametric regression methods were used to predict population values for years in which there were no surveys conducted within a stratum. An internal report (Office of Migratory Bird Management, Laurel, MD) describes how, and for which cases, predictions were calculated.

A survey program written by John I. Hodges, USFWS-Alaska (Retired) provided the basis for recording observations and transcribing into electronic form using two Sony Vaio computers installed in the aircraft. All areas in the current survey design (Tables 3 and 6) were flown. Air-ground comparison segments were used to provide visibility correction factors for waterfowl and pond numbers. This was the 20th year of participation in waterfowl surveys for the pilot/observer and aircraft, a Cessna 206, and the 14th year conducting waterfowl surveys in strata 26-29, 75 and 76,. This was the first year of participation for the aerial observer in Alberta but his 7th year of aerial surveys in Canada. All air and ground crew members participated in pre-survey training.

The Alberta ground crew did reconnaissance of the survey area and concluded that most species observed were paired by 7 May . The aerial crew did reconnaissance and training flights on 5 May and 6 May to determine the survey starting time also. The survey was initiated on 7 May for Southern Alberta and completed on 20 May. The Central Alberta survey commenced on 23 May and concluded on 25 May. Four flight days were lost to poor weather. A total of 65 flight hours were required to complete the survey.

WEATHER AND HABITAT CONDITIONS

The winter of 2007/2008 and the spring of 2008 in Alberta was colder than normal and saw below normal precipitation. Spring was delay at least 7 to 10 days later than normal. Most deciduous tree species were not leafed out until the end of May. Winter precipitation was 40% below normal for much of Prairie Alberta but 90% to 125% above normal in the western mountains. With the cold spring, the mountain run-off was the 10th lowest observed in the past

90 years. (Water Supply Outlook for Alberta, May 2008) The majority of the prairies in May 2008 were in poor condition compared to fair to good condition in 2007. Areas around Calgary, Red Deer, Edmonton and Lloydminster saw above normal precipitation and good waterfowl nesting conditions in 2008. The total 2008 pond estimate was 848,700 ponds in Southern Alberta. This was a decline of 30.7% below last year's estimate of 1,225,400 ponds, was 19.5% above the 10 year- mean, and remained 14.9% above the long- term mean.

The Aspen Parklands of Stratum 75 which received 90% of normal precipitation and hold more permanent type wetlands were in fair condition which is similar to last year. The eastern Peace Parklands of stratum 76 were generally in fair condition having received 97% of normal precipitation. The western portions of Stratum 76 were in poor condition with only 69% of normal precipitation (Water Supply Outlook for Alberta, May 2008). This area was in good condition in May 2007. The total 2008 pond estimate for Central Alberta was 584,500 ponds. This was a decline of 10% from last year's estimate of 649,100 ponds, a 14.9% increase from the 10- year mean and an increase of 17.1% from the long -term average. This year's pond count in strata 75-76 was the third highest on record since 1989.

A storm event happened from 19 May to 25 May 2008. The prairies and mountains of Alberta received 60-120 mm of rain. This will help to fill dry basins and recharge existing wetlands. June precipitation has been 85-120% of normal in Prairie Alberta and 40-60% of normal in the Parklands (Agriculture and Agri-food Canada. 2008).

BREEDING POPULATION INDICES

A listing of all birds and the respective comparisons can be found in Tables 1 and 4, the Trend Graphs, and Appendices 1 and 2.

SOUTHERN ALBERTA

The 2008 waterfowl breeding population estimate for strata 26-29 (Southern Alberta) is 4,207,200 total ducks (Table 1). This is a decrease of 2.1% from 2007, an increase of 30.7% from the recent 10-year mean (1998-2007), and a decrease of 2.3% from the long-term mean (1955-2007). Total gadwall estimates increased 22.4% from last year, increased 28.9% from the 10- year mean and increased 34.7% from the long- term mean. Estimated abundance of American wigeon and Green winged teal were similar to last year. Northern shoveler estimates were the highest on record in 2007. This year they were the second highest on record and declined 36.8% from last year, increased 30.9% from the 10- year mean and were 63.3% above the long- term mean. Total dabblers declined 4.2% from 2007, increased 30.1% from the 10- year mean and declined 4.1% from the long- term average.

Redhead estimates were the highest on record since 1955. They were 86% higher than last year, 196.7% above the 10- year mean and 181.5% above the long- term mean while canvasback numbers were the 5th highest count since 1955. They declined 38% from last year, increased 29.3% from the 10- year mean and increased 21.3% from the long- term mean.. Total divers increased 8.1% from 2007, increased 33.5% from the 10 -year mean and increased 8.2% from the long- term mean (Table 1).

The Canada goose and coot estimates were the highest on record and were well above the long-term mean.

CENTRAL ALBERTA

The 2008 waterfowl breeding population estimate for strata 75-76 (Central Alberta) was 1,565,700 which is an 8.9% decline from last year's estimate of 1,719,200, a 3.6% decline from the long term mean and a 4.3 % increase from the 1955-2007 average. Total gadwall estimates decreased 17.3% from last year, declined 20.4% from the 10 year- mean, and remained unchanged from the long-term mean. Total dabblers declined 14.4% from 2007, declined 6.0% from the 10- year mean and increased 1.9% from the long- term average.

Redheads which seem to respond better to the more permanent type wetlands found in the Parklands increased 18.8% from last year, increased 101.2% from the 10-year mean and increased 137.8% from the long term mean. This is the highest estimate of redheads on record since 1989. Canvasbacks declined 25.2% from last year, increased 22.1% from the 10-year mean and increased 20.5% from the long-term mean. Total divers decreased 1.6% from 2007, had no change from the 10 year mean and increased 7.8% from the long term mean.

The Canada goose estimates were the highest on record since 1989 and were well above the long-term mean.

CONCLUSIONS

In Prairie Canada , population estimates of many species declined; while populations increased in the boreal forest to the north, likely reflecting in part those birds that over flew the prairies because of drier habitat conditions there. (USFWS , May 2008 news release)

- 1) Eight of the past 11 years in Southern Alberta have seen drought conditions. Last year we observed a wet fall, mild winter and normal spring conditions which improved habitat conditions for the third consecutive year in the historically important Northern pintail breeding region of the Prairies and Aspen Parklands. Unfortunately, this year we are seeing drought coming back to Prairie Alberta. The May 2006 survey saw an impressive 116.5% increase in northern pintail counts from 2005. Unfortunately, the 2007 population estimate was 46.9% below the 2006 survey, and even with improved northern pintail habitat, long term means remain below average (54.9%). In 2008 we saw northern pintail numbers continue a downward trend and decreased 26.0% from 2007 and decreased 66.3% from the long term mean.
- 2) Mallard, American wigeon and northern pintail population estimates have been declining in Alberta for the past 20 years.
- 3) Habitat conditions in the Aspen Parklands of stratum 75 improved from last year and conditions declined from last year in stratum 76.
- 4) I believe we are starting to see the tip of the (melting) ice burg of the effect of global warming on waterfowl population re-distribution and climate change in Canada.

Submitted by: Elizabeth Huggins-Flyway Biologist

Date: July 11, 2008

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

Species/Ponds	Stratum 2008				2008 Total	2007 Total	10-Year Mean	Long-term Mean	% Change From		
	26	27	28	29					2007	10-Year Mean	Long-term Mean
Ducks											
Dabblers											
Mallard	488.1	170.4	123.7	93.0	875.2	830.2	798.2	1089.9	5.4	9.7	-19.7
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	-100.0
Gadwall	267.4	68.5	49.7	34.7	420.3	343.4	326.1	312.1	22.4	28.9	34.7
American wigeon	90.6	44.8	26.4	17.9	179.8	170.5	155.2	292.0	5.5	15.8	-38.4
American Green-winged teal	227.3	36.3	13.1	19.8	296.5	283.2	177.8	195.2	4.7	66.8	51.9
Blue-winged teal	555.3	143.7	93.3	25.3	817.7	668.5	496.8	614.5	22.3	64.6	33.1
Northern shoveler	353.0	123.3	89.9	51.4	617.6	977.2	471.8	378.1	-36.8	30.9	63.3
Northern pintail	120.4	44.5	47.6	27.6	240.0	324.1	224.0	711.8	-26.0	7.2	-66.3
Subtotal	2102.2	631.5	443.8	269.7	3447.1	3597.0	2649.9	3593.6	-4.2	30.1	-4.1
Divers											
Redhead	271.3	32.3	23.1	6.3	332.9	179.0	112.2	118.2	86.0	196.7	181.5
Canvasback	59.8	10.1	7.0	2.0	78.9	127.3	61.0	65.1	-38.0	29.3	21.3
Scaups	107.7	26.9	18.5	22.4	175.5	182.3	193.1	347.4	-3.7	-9.1	-49.5
Ring-necked duck	11.4	5.3	3.4	1.3	21.4	32.0	24.9	18.1	-33.1	-14.2	18.2
Goldeneye's	26.7	0.8	7.8	2.3	37.6	28.2	25.6	15.6	33.4	47.1	140.9
Bufflehead	52.9	1.6	3.9	1.8	60.1	98.2	75.9	51.3	-38.7	-20.8	17.2
Ruddy Duck	31.8	4.2	0.0	9.8	45.8	49.2	70.8	79.6	-6.9	-35.3	-42.4
Subtotal	561.5	81.1	63.7	46.0	752.3	696.1	563.5	695.3	8.1	33.5	8.2
Miscellaneous											
Mergansers	5.0	0.9	0.5	1.3	7.7	2.9	5.1	6.4	167.5	52.2	19.8
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	-100.0
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Scoters	0.0	0.0	0.0	0.0	0.0	0.0	0.8	12.2	--	-100.0	-100.0
Subtotal	5.0	0.9	0.5	1.3	7.7	2.9	5.9	18.7	167.5	31.6	-58.7
Total Ducks	2668.7	713.5	508.0	317.0	4207.2	4295.9	3219.3	4307.6	-2.1	30.7	-2.3
Canada Goose	198.3	39.1	47.6	45.9	330.8	219.8	204.5	79.7	50.5	61.8	314.9
American coot	474.2	69.3	68.4	56.0	667.9	444.4	317.1	239.1	50.3	110.6	179.3
Ponds	525.6	123.8	87.3	112.0	848.7	1225.4	710.2	738.6	-30.7	19.5	14.9

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 Alberta. Estimates Prior to 1974 were not adjusted for visibility bias, if applicable.

Year	Stratum 2008				Total
	26	27	28	29	
1961	358.2	105.8	82.0	49.8	595.7
1962	395.5	84.9	73.2	52.5	606.2
1963	543.0	127.9	49.1	57.6	777.6
1964	366.7	97.1	62.1	118.6	644.5
1965	601.7	197.5	95.5	104.2	998.8
1966	490.2	162.6	134.9	76.2	863.9
1967	377.5	155.9	215.8	169.9	919.1
1968	266.1	43.6	47.3	80.9	438.0
1969	483.2	156.4	125.3	94.5	859.5
1970	531.2	187.1	86.5	77.8	882.7
1971	585.4	196.6	121.4	78.0	981.4
1972	517.1	92.7	60.1	61.2	731.1
1973	683.9	136.4	121.3	83.6	1025.2
1974	947.3	259.1	124.1	64.1	1394.6
1975	428.2	205.8	178.3	145.6	957.9
1976	459.6	144.2	104.1	123.7	831.6
1977	433.8	53.0	45.4	55.8	588.0
1978	295.8	89.8	88.6	145.6	619.9
1979	617.2	124.9	100.7	153.7	996.4
1980	281.2	68.1	59.1	52.1	460.6
1981	365.2	80.5	58.9	64.7	569.3
1982	374.6	86.4	66.8	103.3	631.1
1983	318.7	56.0	58.0	64.3	497.1
1984	386.4	69.8	42.9	38.8	537.9
1985	493.5	170.2	89.2	75.3	828.3
1986	514.5	70.7	46.4	96.0	727.5
1987	325.0	151.5	58.1	72.1	606.8
1988	229.3	61.6	52.7	74.3	417.9
1989	274.0	111.2	57.8	105.9	548.9
1990	467.9	116.4	66.2	121.7	772.1
1991	445.7	83.1	73.5	93.4	695.7
1992	328.1	78.3	48.0	48.8	503.2
1993	344.0	139.1	90.7	115.9	689.8
1994	406.1	122.5	69.8	122.0	720.4
1995	417.9	93.2	58.8	118.8	688.7
1996	522.1	138.4	130.5	112.9	903.9
1997	653.6	199.0	143.2	104.6	1100.4
1998	358.1	78.7	66.3	56.2	559.3
1999	469.5	104.6	67.2	74.7	716.0
2000	345.9	89.3	63.1	54.8	553.1
2001	226.4	67.6	56.6	75.1	425.7
2002	249.4	80.1	59.9	87.5	476.9
2003	384.1	167.2	159.5	177.7	888.4
2004	271.0	61.8	97.6	80.3	510.7
2005	539.6	98.2	53.0	59.6	750.4
2006	539.8	165.2	170.6	120.2	995.8
2007	524.9	323.4	253.1	124.0	1225.4
2008	525.6	123.8	87.3	112.0	848.7
10-year Mean	390.9	123.6	104.7	91.0	710.2
Long-term Mean	434.8	122.4	90.1	91.2	738.6
Percent Change:					
From 2007	0.1	-61.7	-65.5	-9.7	-30.7
From 10-year Mean	34.5	0.2	-16.6	23.0	19.5
From Long-term Mean	20.9	1.2	-3.0	22.7	14.9

Table 3. Survey design for Southern Alberta, May 2008.

	<u>STRATUM</u>				Total
	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	
<u>Survey design</u>					
Square miles in stratum	26,448	11,724	12,890	13,235	64,297
Square miles in sample-waterfowl	544.5	288.0	310.5	171.0	1,314
Square miles in sample-ponds	272.3	144.0	155.25	85.5	657
Lineal miles in sample	2,178	1,152	1,242	684	5,256
Number of transects in sample	11	6	7	4	28
Number of segments in sample	121	64	69	38	292
Expansion factor	48.5730	40.7083	41.5137	77.3977	---
<u>Current year coverage</u>					
Square miles in sample-waterfowl	256.5	144.0	130.5	171.0	697.5
Square miles in sample-ponds	126.0	72.0	65.25	85.5	348.75
Lineal miles in sample	1,008	576	522	684	2,790
Number of transects in sample	6	3	3	4	16
Number of segments in sample	57	32	29	38	155
Expansion factor	103.11	81.42	98.77	77.40	c

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	1907.0	1757.6	1986.7	2072.2	1753.0	1502.4	1330.9	983.1	1227.9	1119.4
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	200.3	269.9	187.1	219.6	275.7	369.2	279.6	207.8	198.8	256.6
American wigeon	582.3	535.5	535.8	548.9	616.0	539.9	502.3	380.1	315.2	346.3
American Green-winged teal	351.3	182.2	186.2	205.1	324.4	262.3	320.6	63.4	72.8	114.6
Blue-winged teal	1550.2	903.8	908.6	1078.5	903.6	877.8	897.1	346.7	426.8	634.6
Northern shoveler	397.2	405.0	349.8	442.3	321.1	431.9	303.5	196.8	378.0	342.0
Northern pintail	1591.5	1521.5	1250.6	1223.9	832.6	1087.5	513.3	328.6	811.9	417.6
Subtotal	6579.8	5575.5	5404.8	5790.4	5026.5	5071.0	4147.3	2506.6	3431.5	3231.1
Divers										
Redhead	140.5	145.7	105.9	127.2	113.2	71.3	78.1	44.3	79.6	88.6
Canvasback	96.2	98.7	100.6	168.7	78.1	58.3	63.9	54.6	77.6	83.8
Scaups	427.2	483.2	515.1	490.6	400.2	325.8	393.6	231.9	358.5	400.5
Ring-necked duck	1.4	8.8	1.5	4.5	9.4	2.9	10.1	2.1	1.7	3.4
Goldeneye's	16.0	21.1	15.5	9.1	8.7	11.4	11.2	7.9	2.4	5.9
Bufflehead	26.1	36.6	33.8	39.5	44.6	32.9	53.2	22.1	26.5	24.4
Ruddy Duck	76.2	78.3	43.4	51.6	79.2	97.9	49.8	21.9	37.4	93.0
Subtotal	783.7	872.4	815.8	891.1	733.5	600.4	660.0	384.9	583.8	699.5
Miscellaneous										
Mergansers	0.0	0.0	0.0	5.9	4.0	1.2	0.4	0.0	0.0	1.6
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	0.0	28.0	21.6	20.6	26.9	18.9	25.6	25.2	16.4	17.1
Subtotal	0.0	28.0	21.6	26.5	30.9	20.1	26.0	25.2	16.4	18.7
Total Ducks	7363.6	6475.9	6242.1	6708.1	5790.9	5691.5	4833.3	2916.7	4031.7	3949.3
Canada Goose	0.0	0.7	17.2	35.4	31.2	50.6	37.9	24.7	34.1	38.0
American coot	141.3	108.0	56.6	98.1	169.8	120.1	92.9	19.7	82.2	40.0
Ponds	1266.8	1038.1	688.5	781.1	517.2	962.6	595.7	606.2	777.6	644.5

Species/Ponds	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Ducks										
Dabblers										
Mallard	893.9	1546.7	1502.4	912.0	1121.4	1594.6	1871.3	1825.3	1729.5	1576.2
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	200.3	479.6	415.8	491.6	339.0	343.3	362.8	444.9	281.0	495.6
American wigeon	320.9	385.5	485.3	467.5	403.8	434.3	502.0	448.4	394.1	514.5
American Green-winged teal	117.2	176.1	175.0	121.5	204.5	203.6	263.3	288.1	311.9	404.8
Blue-winged teal	494.1	533.2	712.9	325.3	363.2	440.9	714.3	494.9	459.2	1209.7
Northern shoveler	276.2	470.8	538.5	394.6	433.3	329.1	423.6	435.7	466.1	588.0
Northern pintail	777.1	1265.2	1559.5	501.6	1584.5	1366.4	1763.1	1716.4	1025.1	2123.1
Subtotal	3079.8	4857.2	5389.4	3214.1	4449.8	4712.1	5900.4	5653.8	4666.9	6911.9
Divers										
Redhead	93.3	190.1	194.4	85.0	117.8	74.7	68.7	118.1	89.1	155.3
Canvasback	100.5	68.5	97.9	57.9	26.7	49.4	39.0	65.5	54.0	100.2
Scaups	306.5	238.7	346.8	234.0	350.9	367.9	299.5	426.8	588.9	368.6
Ring-necked duck	11.0	4.3	34.8	11.0	8.7	14.2	36.2	30.6	2.0	15.1
Goldeneye's	1.5	4.9	0.0	5.6	8.9	3.6	20.4	15.6	19.7	17.7
Bufflehead	71.1	33.4	48.6	32.4	44.1	40.4	33.8	53.3	30.6	26.0
Ruddy Duck	93.4	83.0	111.9	96.7	47.9	66.9	56.7	102.0	38.2	93.3
Subtotal	677.3	623.0	834.4	522.7	605.0	617.1	554.4	811.9	822.5	776.3
Miscellaneous										
Mergansers	9.3	7.7	1.8	1.1	1.7	9.4	4.1	4.2	2.1	0.0
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	16.9	20.0	23.6	17.5	21.6	23.2	12.1	13.2	16.0	8.0
Subtotal	26.1	27.7	25.4	18.6	23.3	32.7	16.1	17.4	18.1	8.0
Total Ducks	3783.3	5507.9	6249.2	3755.4	5078.0	5361.9	6470.9	6483.0	5507.5	7696.2
Canada Goose	24.0	19.0	34.6	15.0	23.5	28.4	50.0	30.5	35.7	29.2
American coot	65.1	48.1	202.5	98.8	144.8	169.8	99.7	122.6	145.4	267.0
Ponds	998.8	863.9	919.1	438.0	859.5	882.7	981.4	731.1	1025.2	1394.6

Appendix. 1: Continued.

Species/Ponds	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Ducks										
Dabblers										
Mallard	1398.3	1453.6	853.3	823.5	983.1	975.2	947.1	765.8	845.6	713.0
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Gadwall	303.7	308.7	392.2	279.7	346.4	319.6	309.4	215.5	142.3	204.4
American wigeon	384.3	344.5	194.9	303.5	402.5	403.9	179.8	200.0	170.9	158.4
American Green-winged teal	230.8	345.6	151.9	222.3	256.8	224.0	180.1	127.5	136.2	117.7
Blue-winged teal	1108.2	820.3	751.0	393.2	592.9	834.6	1148.1	498.1	419.1	429.2
Northern shoveler	550.3	325.0	220.8	259.0	391.4	388.8	503.9	320.4	200.3	187.3
Northern pintail	1553.1	956.5	345.8	1087.6	1456.4	842.3	657.3	576.8	380.8	299.8
Subtotal	5528.7	4554.3	2909.8	3368.7	4429.5	3988.3	3926.1	2704.1	2295.1	2109.9
Divers										
Redhead	181.7	173.4	202.1	133.8	100.7	268.4	111.1	57.8	60.4	98.3
Canvasback	78.9	52.1	64.6	51.2	53.5	62.1	49.4	73.8	49.7	26.6
Scaups	382.7	625.9	477.7	463.0	687.5	473.0	469.3	522.1	491.9	367.5
Ring-necked duck	26.0	13.5	23.9	50.9	21.3	8.9	29.5	23.7	12.7	33.6
Goldeneye's	15.5	28.3	3.9	33.2	7.6	29.6	4.6	6.8	6.8	1.7
Bufflehead	56.1	47.3	35.2	60.6	67.2	32.3	55.5	42.2	57.4	25.8
Ruddy Duck	184.7	33.6	101.5	75.5	42.0	33.9	63.0	116.0	72.9	62.3
Subtotal	925.7	974.1	908.9	868.3	979.7	908.2	782.5	842.4	751.8	615.8
Miscellaneous										
Mergansers										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	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	7.3	24.1	13.5	26.0	36.2	20.4	7.7	11.8	6.4	17.3
Subtotal	23.8	24.1	18.3	42.1	41.9	38.3	21.2	27.9	21.7	22.2
Total Ducks	6478.2	5552.5	3837.0	4279.1	5451.1	4934.9	4729.8	3574.4	3068.6	2748.0
Canada Goose	30.2	19.8	23.8	30.2	35.5	21.1	45.6	40.3	41.7	46.8
American coot	483.3	83.5	285.4	168.4	418.0	501.1	405.0	371.7	253.2	542.7
Ponds	957.9	831.6	588.0	619.9	996.4	460.6	569.3	631.1	497.1	537.9

Species/Ponds	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Ducks										
Dabblers										
Mallard	803.0	698.8	753.9	627.4	585.9	778.7	769.2	733.5	753.8	848.8
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	164.9	226.4	127.1	256.4	250.2	414.4	292.7	358.0	414.3	511.7
American wigeon	177.3	90.2	110.4	85.5	95.9	123.2	117.9	170.3	198.5	193.2
American Green-winged teal	106.7	78.7	120.3	162.0	106.0	132.5	131.1	174.4	175.9	152.6
Blue-winged teal	295.3	361.9	596.6	552.9	418.2	521.2	580.2	716.1	526.6	466.6
Northern shoveler	321.2	220.7	330.7	165.6	227.9	322.5	294.5	241.4	421.1	421.4
Northern pintail	593.4	242.6	447.4	171.4	313.6	317.7	116.3	103.9	372.5	383.4
Subtotal	2461.7	1919.3	2486.4	2021.3	1997.7	2610.3	2301.9	2497.7	2862.8	2977.7
Divers										
Redhead	133.9	123.3	143.5	85.7	96.6	162.8	110.8	112.0	110.3	110.3
Canvasback	56.6	59.2	53.5	54.8	36.7	78.1	58.4	32.8	45.9	64.0
Scaups	363.2	322.7	256.2	345.2	158.0	307.3	299.8	288.0	268.4	265.0
Ring-necked duck	18.7	11.7	18.6	35.3	46.5	12.4	14.9	15.4	9.6	12.6
Goldeneye's	16.2	29.9	24.2	31.6	16.1	19.3	10.6	10.1	9.5	15.1
Bufflehead	17.0	33.8	22.7	50.8	32.5	36.5	80.0	67.6	79.6	43.1
Ruddy Duck	43.8	32.9	35.8	77.9	65.6	129.9	193.8	85.2	57.1	65.5
Subtotal	649.4	613.5	554.4	681.3	451.9	746.4	768.3	611.1	580.3	575.5
Miscellaneous										
Mergansers										
Long-tailed duck	0.0	0.0	0.0	0.0	0.0	0.0	0.4	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	18.6	17.2	1.1	7.2	5.6	9.9	15.5	4.4	0.8	5.2
Subtotal	27.5	25.8	11.1	28.8	14.2	14.9	31.1	13.1	7.1	12.1
Total Ducks	3138.6	2558.7	3052.0	2731.3	2463.9	3371.6	3101.3	3121.9	3450.1	3565.3
Canada Goose	49.6	79.6	59.0	95.5	79.3	113.8	66.8	100.1	85.1	129.0
American coot	327.3	282.2	137.9	166.1	349.5	485.7	279.7	307.4	282.1	234.7
Ponds	828.3	727.5	606.8	417.9	548.9	772.1	695.7	503.2	689.8	720.4

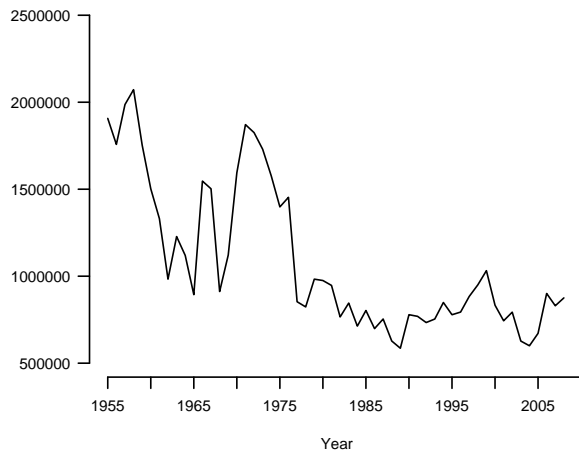
Appendix. 1: Continued.

Species/Ponds	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Ducks										
Dabblers										
Mallard	778.5	793.8	883.6	950.1	1031.8	833.2	743.8	793.3	627.1	600.1
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	410.6	404.2	308.3	360.2	332.5	310.9	256.8	333.4	240.9	289.9
American wigeon	179.8	191.1	190.5	150.3	179.6	225.2	186.8	77.5	131.6	116.6
American Green-winged teal	245.3	314.5	324.4	92.2	190.5	308.1	190.5	147.0	131.8	98.4
Blue-winged teal	430.8	505.9	358.5	521.9	391.5	577.8	367.8	244.2	322.6	360.2
Northern shoveler	267.6	373.8	443.2	329.4	408.2	380.4	267.8	273.9	448.4	384.6
Northern pintail	198.2	333.5	472.8	166.3	115.0	188.8	66.1	73.0	251.9	161.3
Subtotal	2510.7	2916.8	2981.3	2570.5	2649.2	2824.4	2079.5	1942.3	2154.3	2011.2
Divers										
Redhead	95.2	102.7	188.9	67.5	180.7	106.8	53.9	112.5	96.9	78.9
Canvasback	60.5	67.0	68.5	68.6	56.1	73.2	31.9	14.5	69.7	50.2
Scaups	366.5	376.3	347.7	243.1	228.2	292.3	201.9	146.5	172.1	124.1
Ring-necked duck	9.0	10.1	37.4	11.9	52.0	16.2	20.2	7.5	31.1	44.1
Goldeneye's	31.4	6.1	6.9	44.7	5.8	26.5	22.6	6.6	34.2	26.3
Bufflehead	68.3	103.5	91.3	73.9	69.5	70.9	59.2	47.2	82.9	70.6
Ruddy Duck	128.5	302.2	87.1	123.6	73.4	74.3	51.6	86.5	54.9	93.5
Subtotal	759.4	967.8	827.9	633.3	665.8	660.3	441.3	421.3	541.7	487.6
Miscellaneous										
Mergansers										
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	10.9	0.3	1.3	0.0	0.3	0.0	1.8	0.5	0.0	0.8
Subtotal	21.3	6.2	11.1	5.4	8.4	5.1	10.3	11.0	2.6	5.0
Total Ducks	3291.4	3890.9	3820.2	3209.2	3323.4	3489.7	2531.1	2374.5	2698.6	2503.8
Canada Goose	158.0	160.2	109.8	191.6	151.8	269.5	213.5	196.9	193.3	214.6
American coot	232.9	234.4	377.5	260.0	342.3	418.8	207.4	376.1	222.3	240.2
Ponds	688.7	903.9	1100.4	559.3	716.0	553.1	425.7	476.9	888.4	510.7

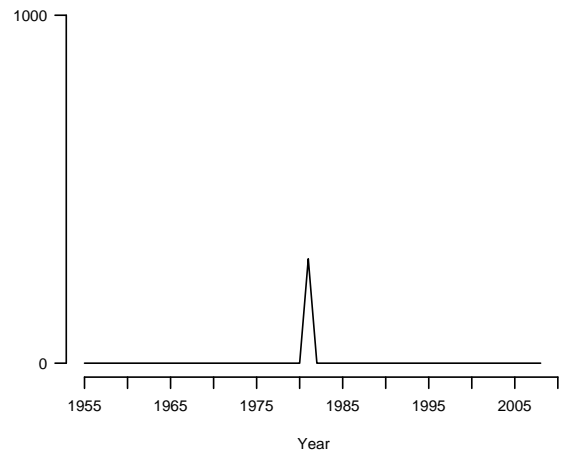
Species/Ponds	2005	2006	2007	2008
Ducks				
Dabblers				
Mallard	671.4	900.7	830.2	875.2
American Black Duck	0.0	0.0	0.0	0.0
Gadwall	338.2	455.2	343.4	420.3
American wigeon	125.5	188.6	170.5	179.8
American Green-winged teal	158.5	177.9	283.2	296.5
Blue-winged teal	649.2	864.3	668.5	817.7
Northern shoveler	547.6	700.8	977.2	617.6
Northern pintail	282.3	611.0	324.1	240.0
Subtotal	2772.6	3898.5	3597.0	3447.1
Divers				
Redhead	91.3	154.3	179.0	332.9
Canvasback	42.7	76.3	127.3	78.9
Scaups	126.5	213.9	182.3	175.5
Ring-necked duck	12.9	21.5	32.0	21.4
Goldeneye's	10.6	50.4	28.2	37.6
Bufflehead	78.9	107.6	98.2	60.1
Ruddy Duck	42.7	58.3	49.2	45.8
Subtotal	405.6	682.2	696.1	752.3
Miscellaneous				
Mergansers				
Long-tailed duck	0.0	0.0	0.0	0.0
Eiders	0.0	0.0	0.0	0.0
Scoters	0.3	4.3	0.0	0.0
Subtotal	2.2	5.9	2.9	7.7
Total Ducks	3180.4	4586.6	4295.9	4207.2
Canada Goose	212.2	181.5	219.8	330.8
American coot	240.9	419.0	444.4	667.9
Ponds	750.4	995.8	1225.4	848.7

Appendix 2: Long-term trends in adjusted waterfowl breeding population estimates for Southern Alberta.

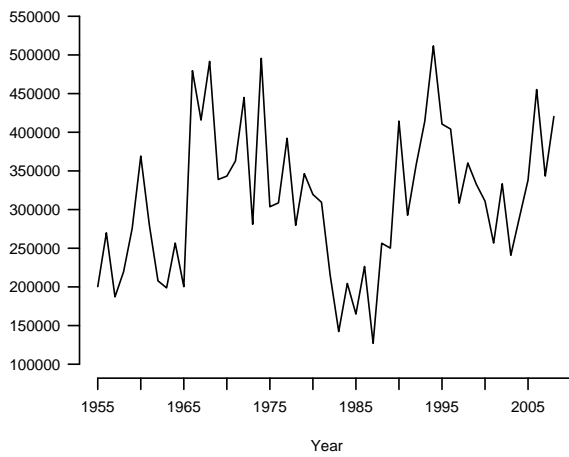
Strata 26,27,28,29 Mallard



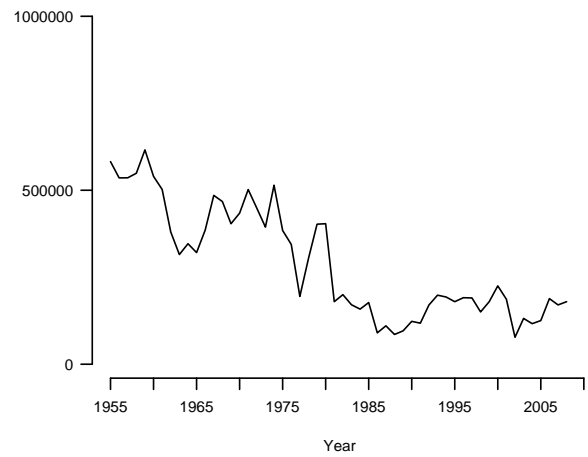
Strata 26,27,28,29 American Black Duck



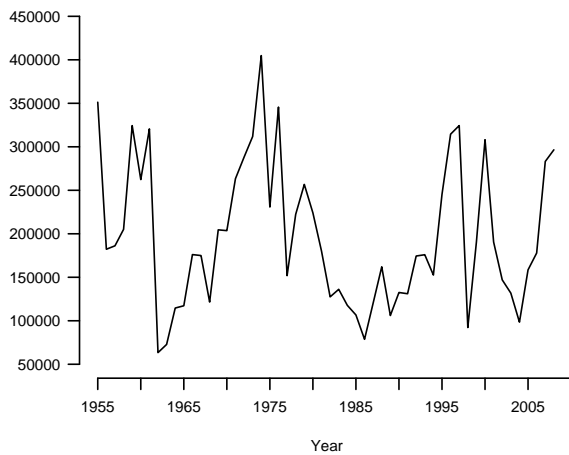
Strata 26,27,28,29 Gadwall



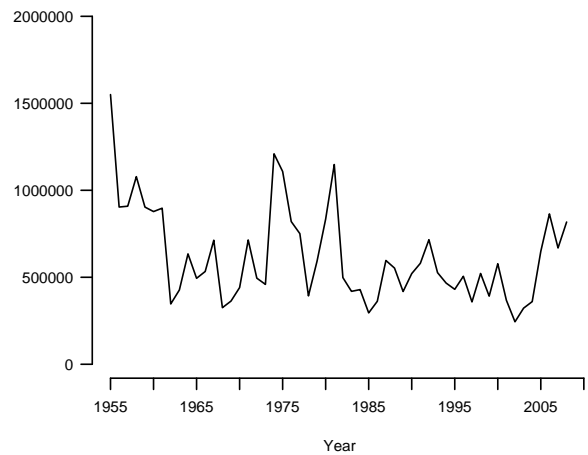
Strata 26,27,28,29 American wigeon



Strata 26,27,28,29 American Green-winged teal

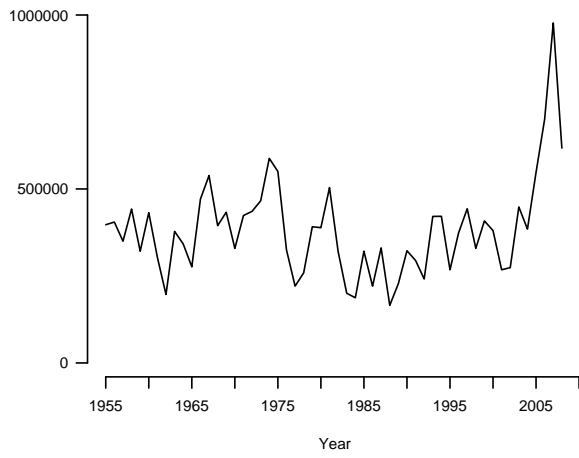


Strata 26,27,28,29 Blue-winged teal

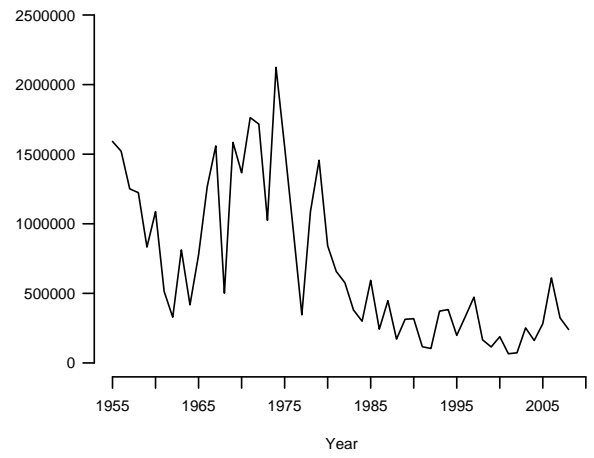


Appendix 2: Continued.

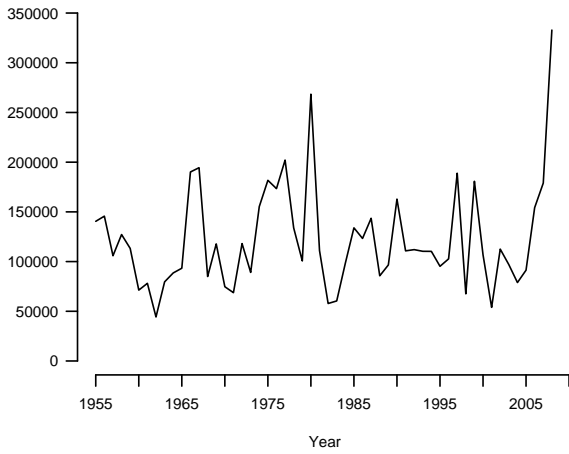
Strata 26,27,28,29 Northern shoveler



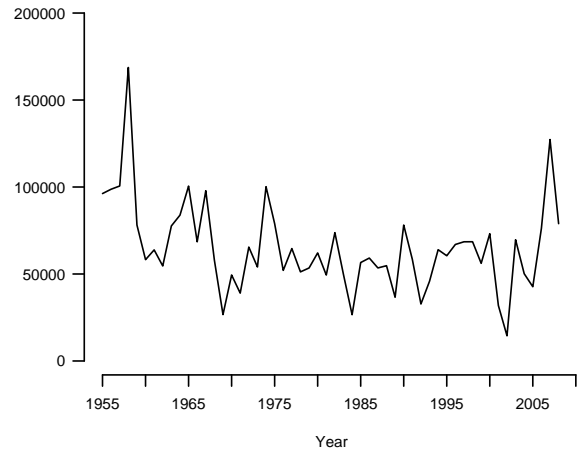
Strata 26,27,28,29 Northern pintail



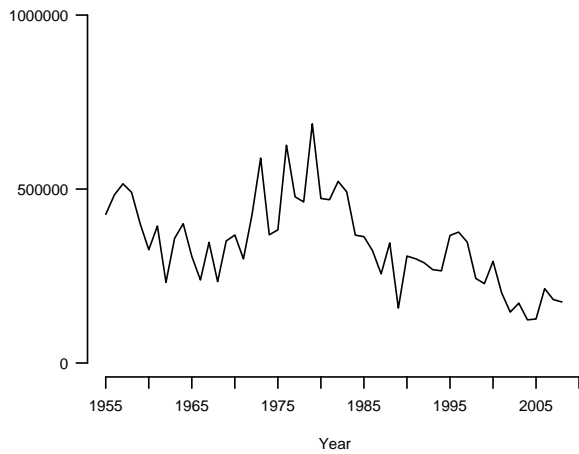
Strata 26,27,28,29 Redhead



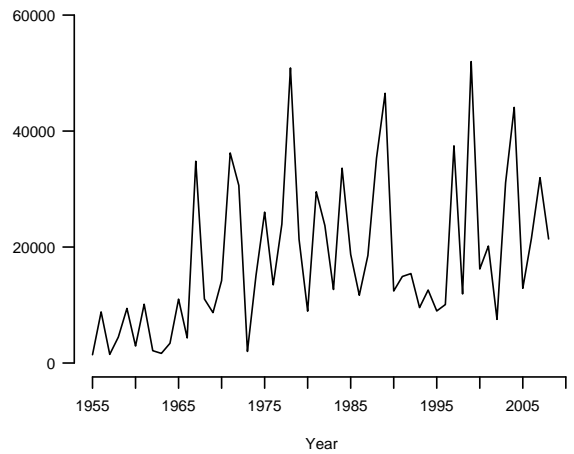
Strata 26,27,28,29 Canvasback



Strata 26,27,28,29 Scaups

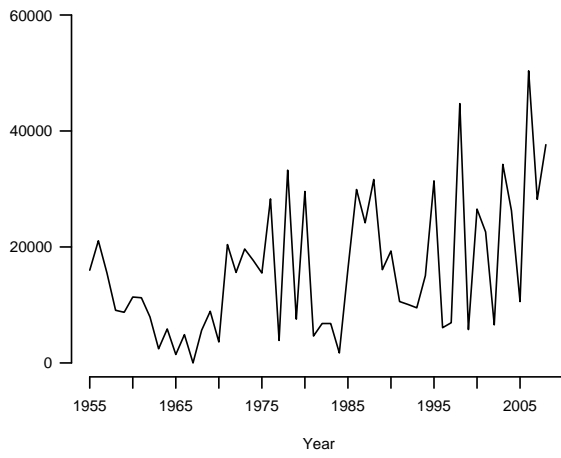


Strata 26,27,28,29 Ring-necked duck

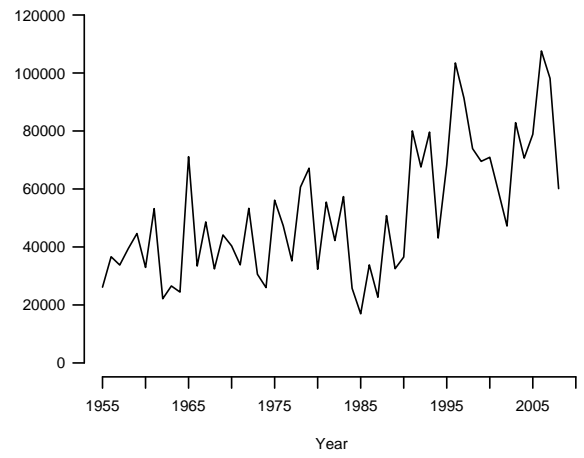


Appendix 2: Continued.

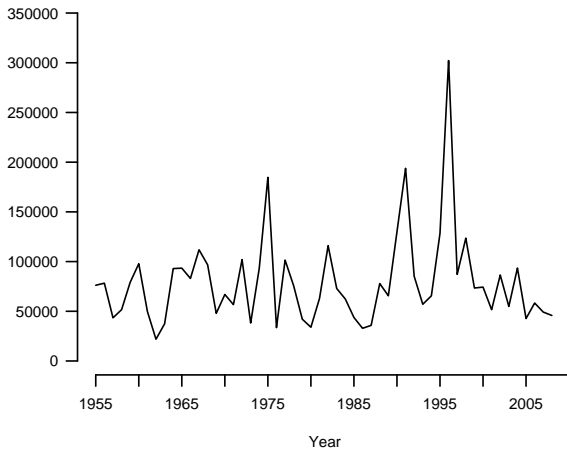
Strata 26,27,28,29 Goldeneye's



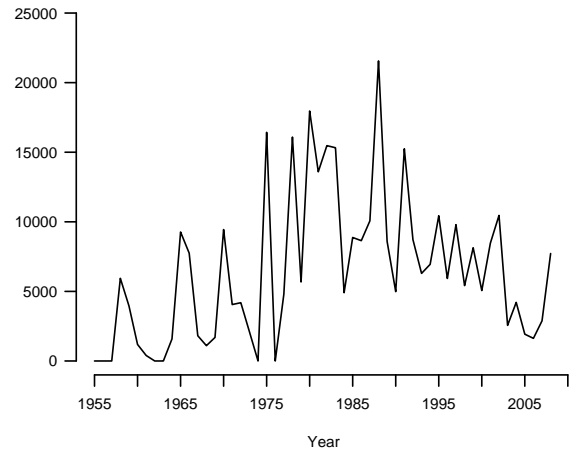
Strata 26,27,28,29 Bufflehead



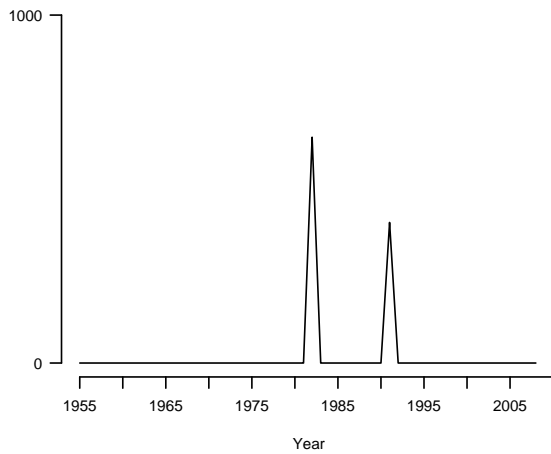
Strata 26,27,28,29 Ruddy Duck



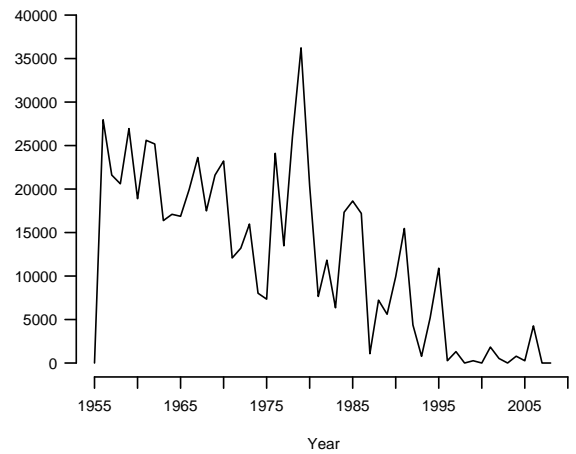
Strata 26,27,28,29 Mergansers



Strata 26,27,28,29 Long-tailed duck

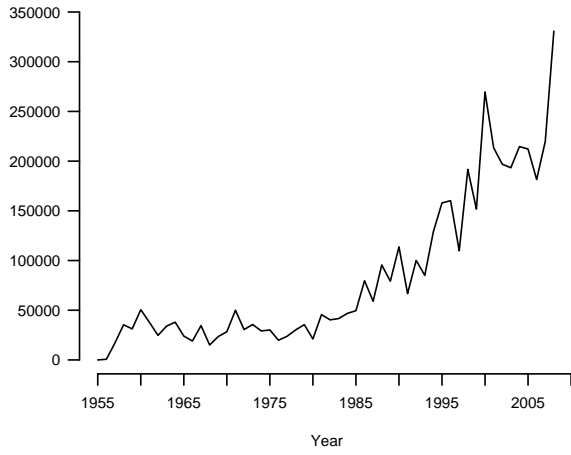


Strata 26,27,28,29 Scoters

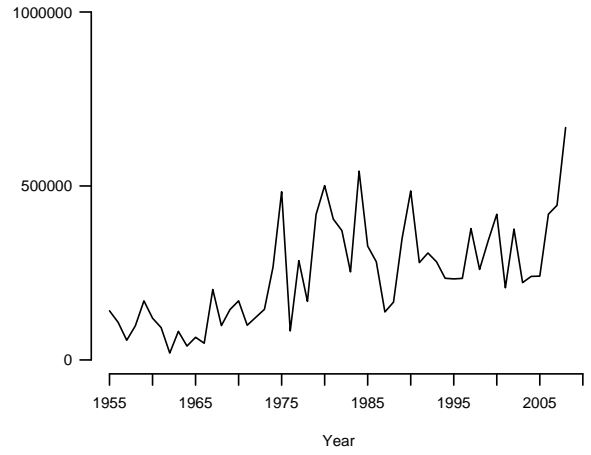


Appendix 2: Continued.

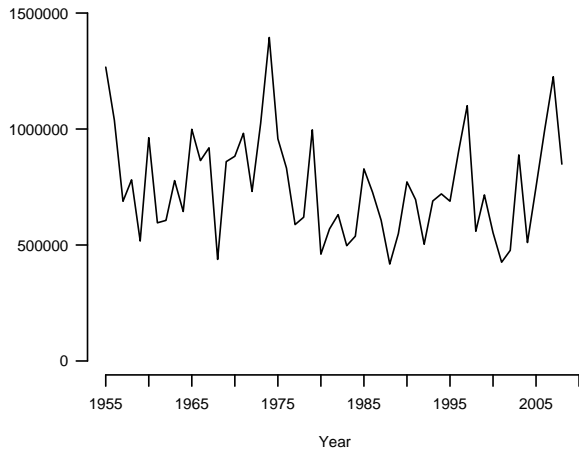
Strata 26,27,28,29 Canada Goose



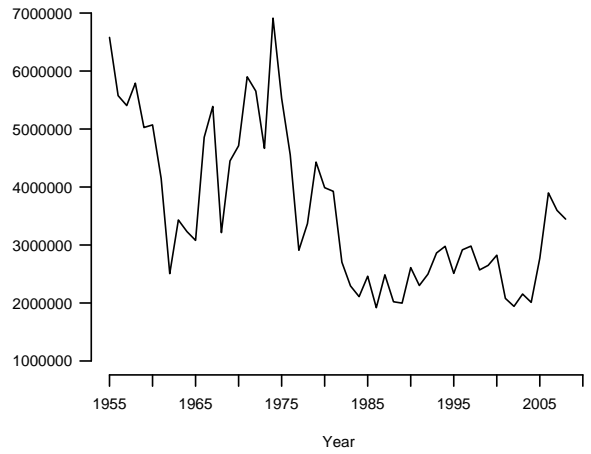
Strata 26,27,28,29 American coot



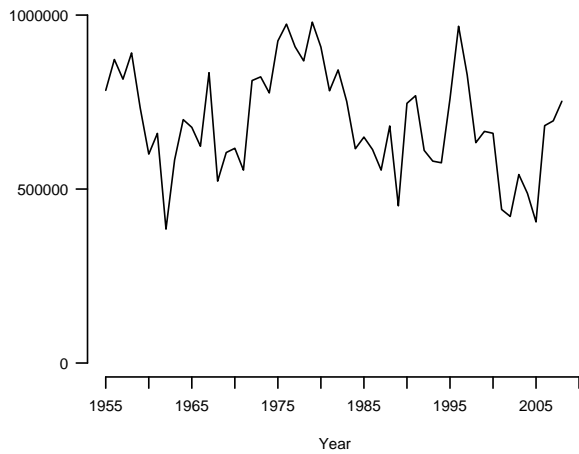
Strata 26,27,28,29 Ponds



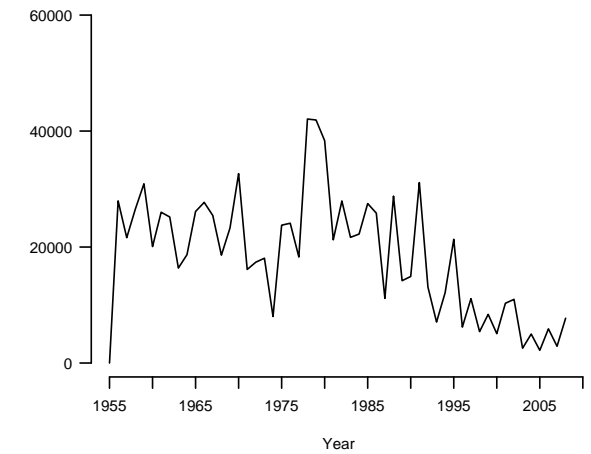
Strata 26,27,28,29 Dabblers



Strata 26,27,28,29 Divers



Strata 26,27,28,29 Miscellaneous



Appendix 2: Continued.

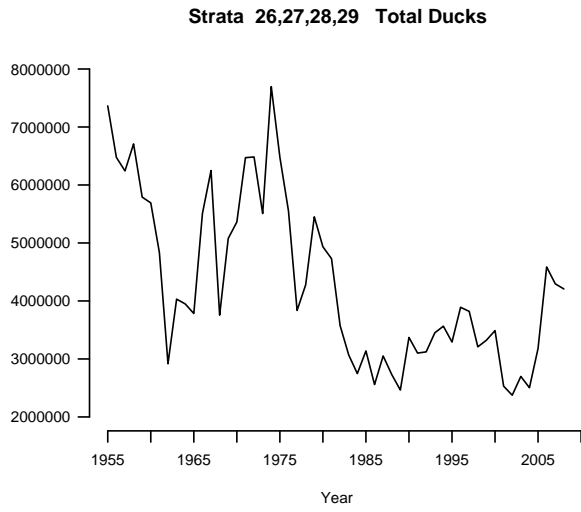


Table 4: Status of waterfowl population estimates (thousands, adjusted for visibility bias), by species and stratum with comparison for the previous year, the previous 10-year mean, and the long-term mean for Central Alberta.

Species/Ponds	Stratum 2008				% Change From				
	75	76	2008 Total	2007 Total	10-Year Mean	Long-Term Mean	2007	10-Year Mean	Long-term Mean
	Ducks								
Dabblers									
Mallard	149.4	210.1	359.4	324.9	423.2	406.4	10.6	-15.1	-11.6
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Gadwall	36.6	31.2	67.8	81.9	85.2	67.5	-17.3	-20.4	0.4
American wigeon	19.0	24.6	43.6	28.9	51.3	73.9	50.8	-15.0	-40.9
American Green-winged teal	51.1	92.0	143.1	161.9	145.6	122.6	-11.6	-1.7	16.7
Blue-winged teal	57.8	140.8	198.6	266.6	188.7	158.0	-25.5	5.2	25.7
Northern shoveler	60.0	71.9	131.9	205.0	109.9	95.4	-35.6	20.0	38.2
Northern pintail	8.1	10.6	18.8	56.1	20.7	21.2	-66.6	-9.5	-11.6
Subtotal	381.9	581.3	963.2	1125.3	1024.6	945.0	-14.4	-6.0	1.9
Divers									
Redhead	43.0	41.2	84.2	70.9	41.9	35.4	18.8	101.2	137.8
Canvasback	34.5	7.2	41.7	55.7	34.1	34.6	-25.2	22.1	20.5
Scaups	60.0	67.8	127.8	207.4	162.2	155.8	-38.4	-21.2	-18.0
Ring-necked duck	44.1	63.5	107.6	23.6	36.5	37.5	356.5	195.2	186.9
Goldeneye's	27.8	13.3	41.1	9.6	43.6	44.0	327.4	-5.7	-6.5
Bufflehead	82.6	74.7	157.3	187.6	193.8	176.0	-16.2	-18.8	-10.7
Ruddy Duck	9.9	11.6	21.4	35.6	72.2	55.7	-39.8	-70.3	-61.5
Subtotal	301.8	279.3	581.1	590.3	584.3	539.0	-1.6	-0.5	7.8
Miscellaneous									
Mergansers	6.6	2.0	8.6	0.0	7.8	8.4	--	9.3	2.5
Long-tailed duck	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	--	--	--
Scoters	0.0	12.8	12.8	3.6	7.5	8.2	254.7	71.4	56.5
Subtotal	6.6	14.8	21.4	3.6	15.3	16.6	491.8	39.6	29.2
Total Ducks	690.3	875.3	1565.7	1719.2	1624.2	1500.5	-8.9	-3.6	4.3
Canada Goose	74.3	74.2	148.5	85.2	84.5	56.4	74.4	75.7	163.2
American coot	173.2	82.1	255.2	84.3	227.7	155.9	202.6	12.1	63.7
Ponds	232.5	352.0	584.5	649.1	508.5	499.2	-10.0	14.9	17.1

Table 5: 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 Central Alberta. Estimates Prior to 1974 were not adjusted for visibility bias, if applicable.

Year	Stratum 2008		
	75	76	Total
1989	160.4	251.5	411.9
1990	174.4	315.5	489.9
1991	166.1	252.1	418.2
1992	137.2	282.0	419.2
1993	156.2	245.3	401.5
1994	147.2	238.2	385.4
1995	175.1	330.9	505.9
1996	239.3	329.6	569.0
1997	394.1	405.4	799.5
1998	170.5	225.5	395.9
1999	209.0	337.2	546.2
2000	129.0	298.2	427.2
2001	139.6	266.4	406.0
2002	184.8	387.8	572.5
2003	181.0	336.0	517.0
2004	172.7	329.3	502.1
2005	278.7	301.8	580.5
2006	216.1	272.4	488.4
2007	237.3	411.8	649.1
2008	232.5	352.0	584.5
10-year Mean	191.9	316.6	508.5
Long-term Mean	193.1	306.1	499.2
Percent Change:			
From 2007	-2.0	-14.5	-10.0
From 10-year Mean	21.2	11.2	14.9
From Long-term Mean	20.4	15.0	17.1

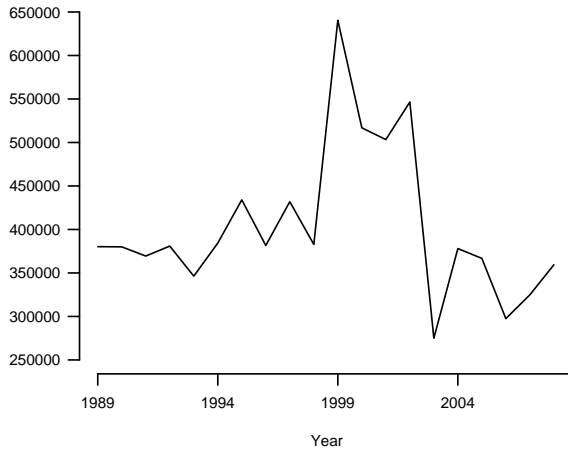
Appendix. 3: Long-term trend in adjusted waterfowl breeding population estimates (thousands).

Species/Ponds	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Ducks										
Dabblers										
Mallard	380.2	380.0	369.4	380.9	346.4	384.4	434.0	381.6	431.9	382.8
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	59.3	62.6	32.1	41.3	31.7	41.1	29.4	64.6	68.3	99.2
American wigeon	62.0	84.2	101.6	82.4	97.7	97.2	139.0	115.6	110.8	57.6
American Green-winged teal	50.6	41.1	57.5	62.7	82.4	121.9	144.0	146.1	167.9	41.4
Blue-winged teal	161.3	160.2	127.2	158.2	55.6	95.1	76.1	163.6	117.0	183.4
Northern shoveler	87.4	101.4	60.7	100.6	46.8	65.0	62.6	76.1	113.5	87.4
Northern pintail	35.2	23.5	7.2	8.4	2.9	12.5	13.8	18.1	74.4	13.3
Subtotal	835.9	852.9	755.8	834.5	663.4	817.3	899.0	965.8	1083.8	865.0
Divers										
Redhead	21.7	26.3	15.0	72.8	31.7	23.1	9.6	18.4	35.7	50.2
Canvasback	28.9	37.6	5.6	13.7	59.0	42.8	10.6	90.4	26.7	61.3
Scaups	128.0	194.9	124.6	153.4	136.9	131.9	126.3	182.5	159.2	81.1
Ring-necked duck	24.7	20.2	18.0	15.5	25.1	88.2	86.2	44.2	26.1	32.2
Goldeneye's	28.5	50.6	39.4	25.2	39.4	55.7	71.0	16.4	73.5	47.0
Bufflehead	87.0	135.2	156.1	220.3	116.7	90.8	136.8	232.2	231.8	202.5
Ruddy Duck	64.7	44.2	5.7	62.8	60.7	4.9	27.5	57.6	7.5	194.8
Subtotal	383.6	509.1	364.4	563.8	469.6	437.4	468.1	641.7	560.6	669.1
Miscellaneous										
Mergansers	6.6	39.5	2.4	6.0	9.3	3.3	11.3	1.3	0.6	1.3
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	9.0	11.4	12.6	10.7	3.4	10.1	11.8	0.5	11.5	4.3
Subtotal	15.6	50.8	15.0	16.8	12.7	13.4	23.1	1.9	12.1	5.5
Total Ducks	1235.1	1412.8	1135.1	1415.1	1145.7	1268.1	1390.2	1609.4	1656.5	1539.7
Canada Goose	12.5	19.0	15.4	19.8	18.9	20.7	43.3	48.2	29.1	71.1
American coot	26.4	158.7	21.6	64.0	62.6	39.7	31.9	37.7	243.3	375.3
Ponds	411.9	489.9	418.2	419.2	401.5	385.4	505.9	569.0	799.5	395.9

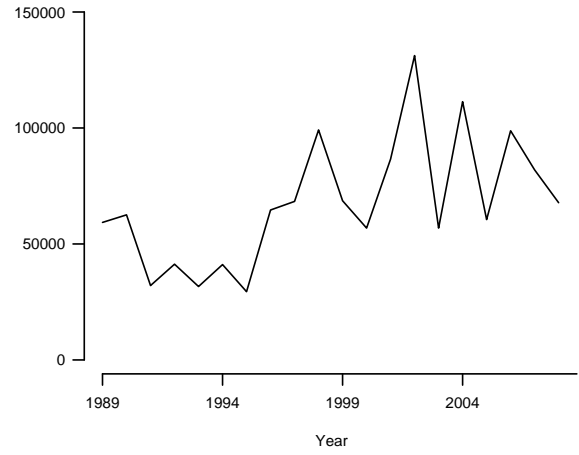
Species/Ponds	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Ducks										
Dabblers										
Mallard	640.5	516.8	503.3	546.5	275.0	378.0	366.8	297.5	324.9	359.4
American Black Duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	68.6	56.8	86.6	131.2	56.8	111.3	60.5	98.8	81.9	67.8
American wigeon	93.0	44.3	61.5	45.4	37.8	47.7	53.0	44.1	28.9	43.6
American Green-winged teal	174.0	327.3	70.6	184.1	40.0	95.7	157.3	203.1	161.9	143.1
Blue-winged teal	150.1	246.8	76.1	204.8	74.9	292.5	217.0	175.3	266.6	198.6
Northern shoveler	78.4	99.1	101.0	157.6	73.7	113.2	112.6	70.9	205.0	131.9
Northern pintail	19.8	10.8	5.9	15.5	18.3	22.0	16.5	29.0	56.1	18.8
Subtotal	1224.5	1301.9	905.1	1285.1	576.5	1060.5	983.6	918.8	1125.3	963.2
Divers										
Redhead	82.9	18.0	20.1	21.9	19.4	57.2	30.8	47.1	70.9	84.2
Canvasback	34.5	10.6	24.9	26.1	43.8	24.8	25.1	34.5	55.7	41.7
Scaups	207.0	181.0	208.7	144.2	138.3	201.7	142.9	110.2	207.4	127.8
Ring-necked duck	61.8	28.5	32.0	6.7	36.7	38.1	46.1	58.8	23.6	107.6
Goldeneye's	9.9	35.1	58.7	31.3	161.4	48.3	8.6	26.1	9.6	41.1
Bufflehead	190.3	133.9	163.9	193.4	171.1	215.3	220.5	259.4	187.6	157.3
Ruddy Duck	27.3	67.8	31.0	82.3	119.4	80.8	49.7	33.1	35.6	21.4
Subtotal	613.7	474.9	539.2	505.8	690.2	666.3	523.7	569.3	590.3	581.1
Miscellaneous										
Mergansers	9.3	15.5	18.9	22.1	2.3	5.4	2.3	1.4	0.0	8.6
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	2.9	8.8	16.2	2.8	1.6	20.8	5.1	8.9	3.6	12.8
Subtotal	12.2	24.3	35.1	24.9	3.9	26.2	7.4	10.3	3.6	21.4
Total Ducks	1850.4	1801.1	1479.4	1815.8	1270.5	1753.0	1514.7	1498.4	1719.2	1565.7
Canada Goose	93.8	114.5	76.7	85.0	69.0	92.0	72.5	85.3	85.2	148.5
American coot	142.4	548.6	48.9	386.8	57.3	228.3	215.4	189.2	84.3	255.2
Ponds	546.2	427.2	406.0	572.5	517.0	502.1	580.5	488.4	649.1	584.5

Appendix 4: Long-term trends in adjusted waterfowl breeding population estimates for Central Alberta.

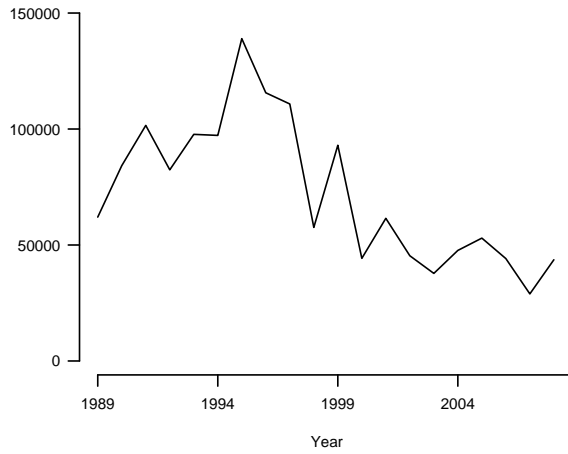
Strata 75,76 Mallard



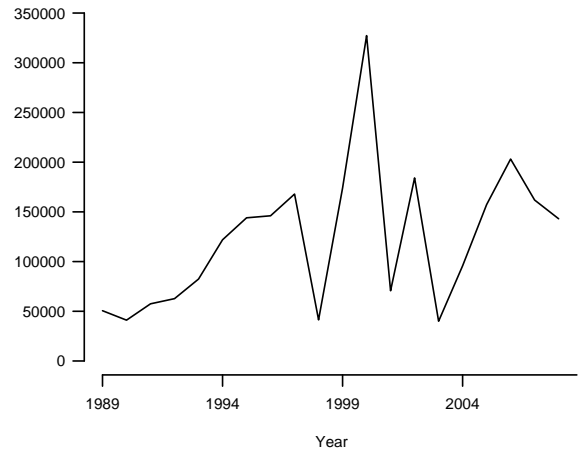
Strata 75,76 Gadwall



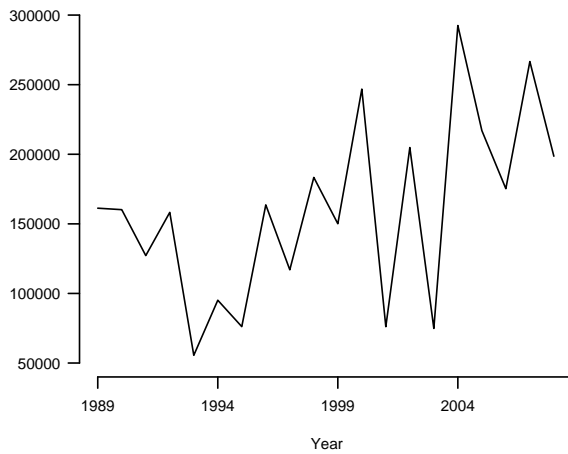
Strata 75,76 American wigeon



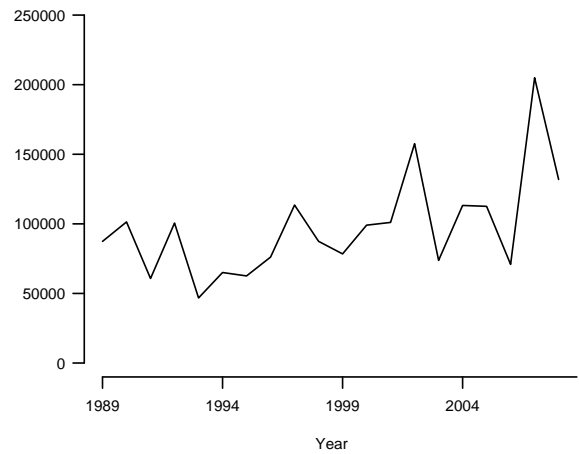
Strata 75,76 American Green-winged teal



Strata 75,76 Blue-winged teal

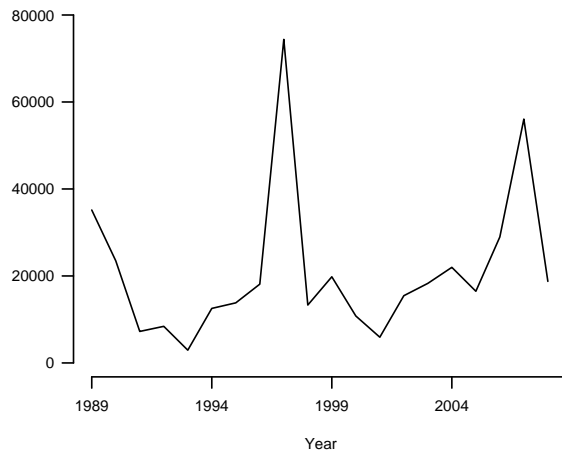


Strata 75,76 Northern shoveler

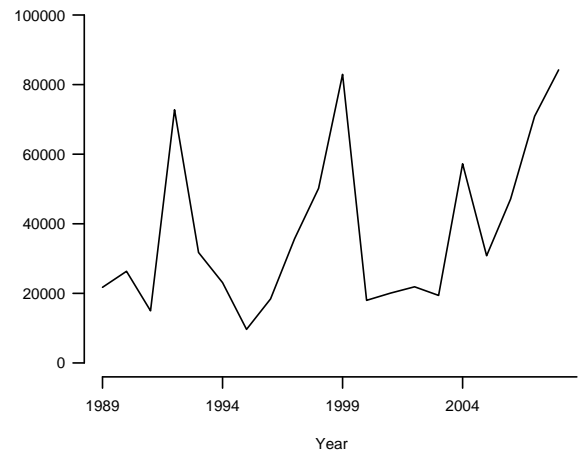


Appendix 4: Continued.

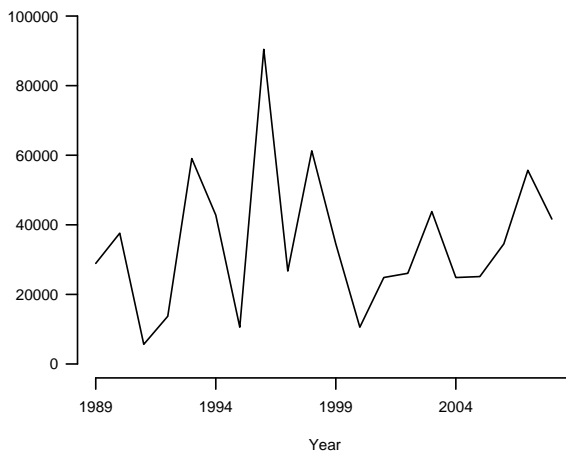
Strata 75,76 Northern pintail



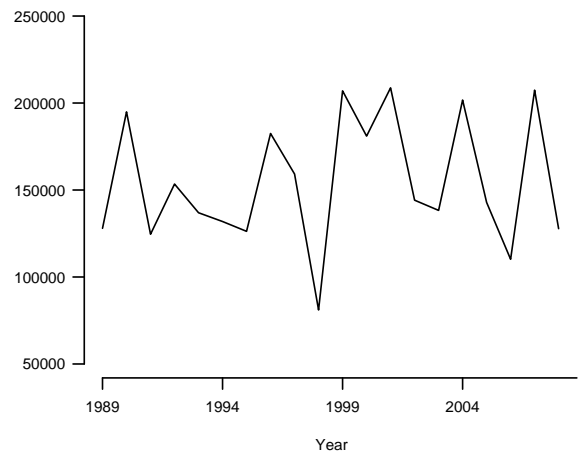
Strata 75,76 Redhead



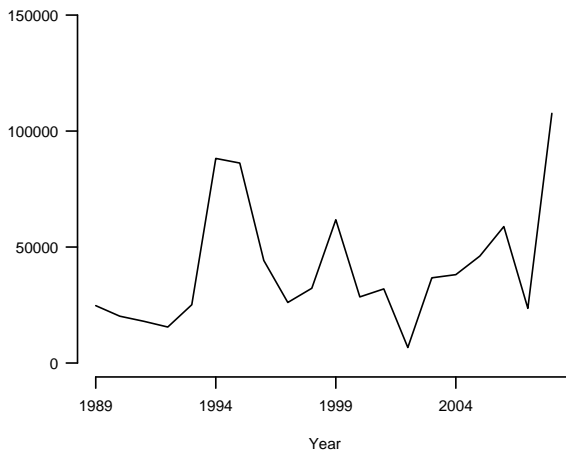
Strata 75,76 Canvasback



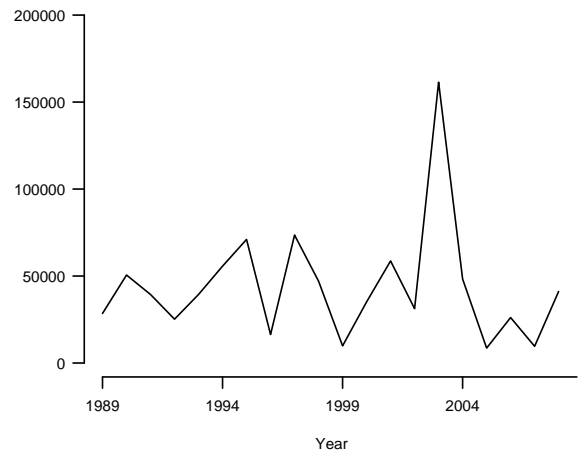
Strata 75,76 Scaups



Strata 75,76 Ring-necked duck

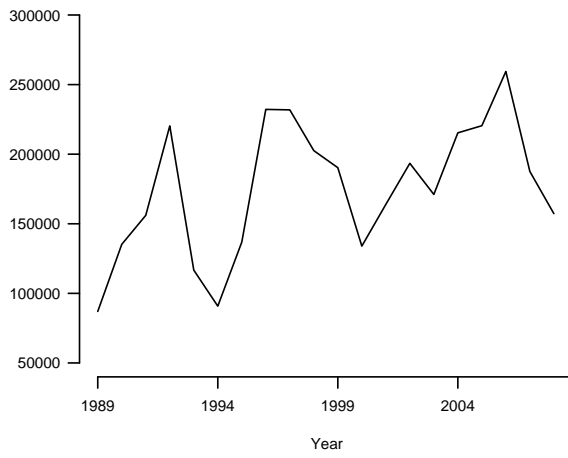


Strata 75,76 Goldeneye's

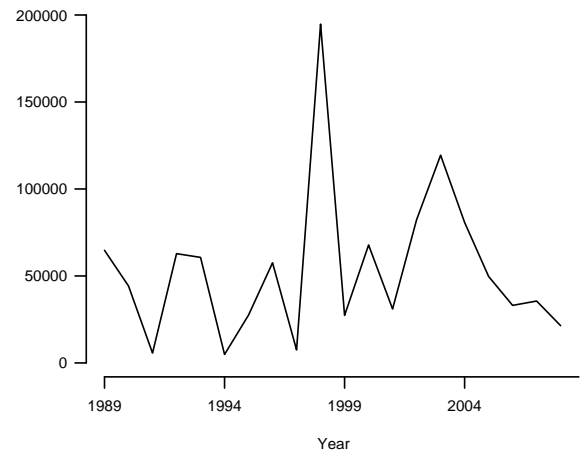


Appendix 4: Continued.

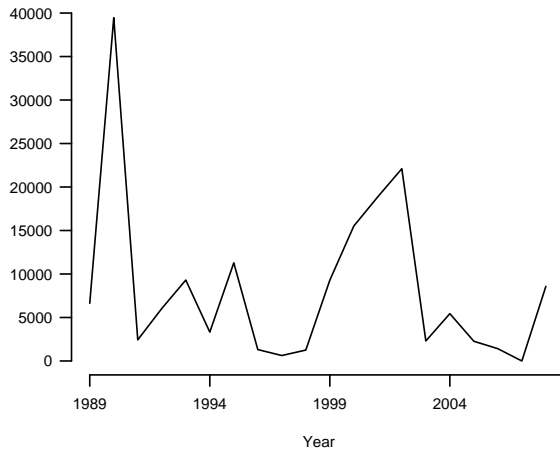
Strata 75,76 Bufflehead



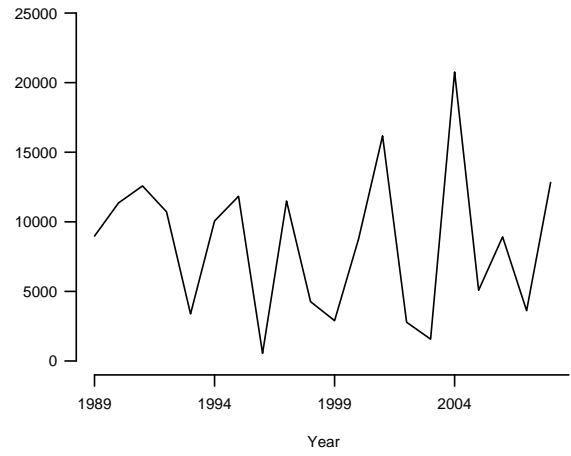
Strata 75,76 Ruddy Duck



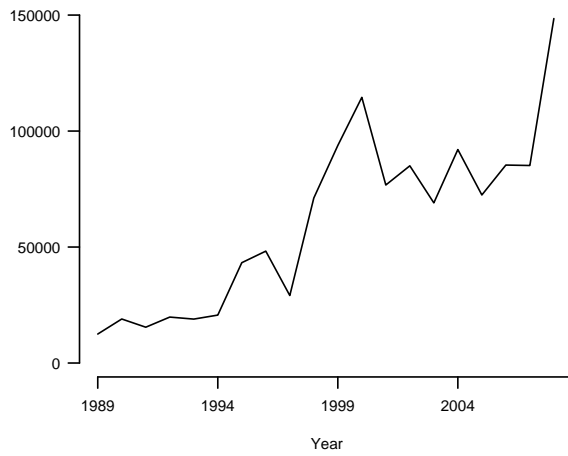
Strata 75,76 Mergansers



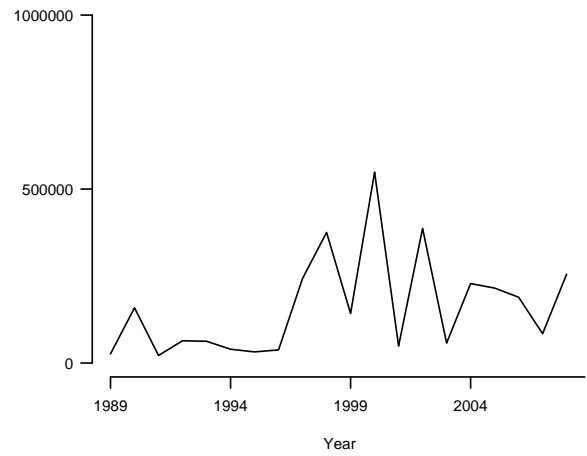
Strata 75,76 Scoters



Strata 75,76 Canada Goose

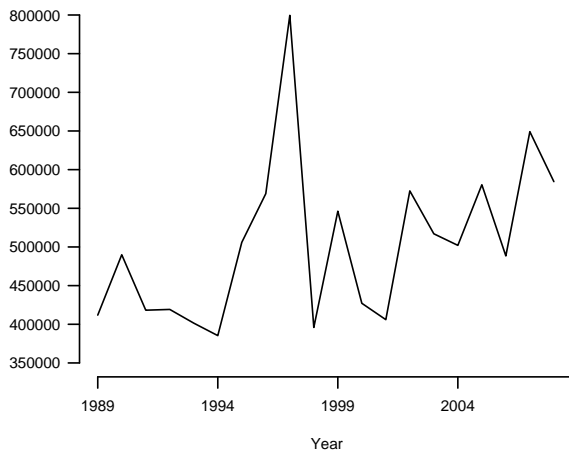


Strata 75,76 American Coot

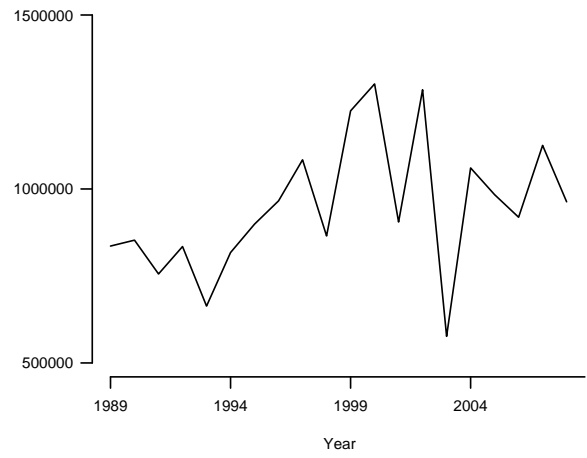


Appendix 4: Continued.

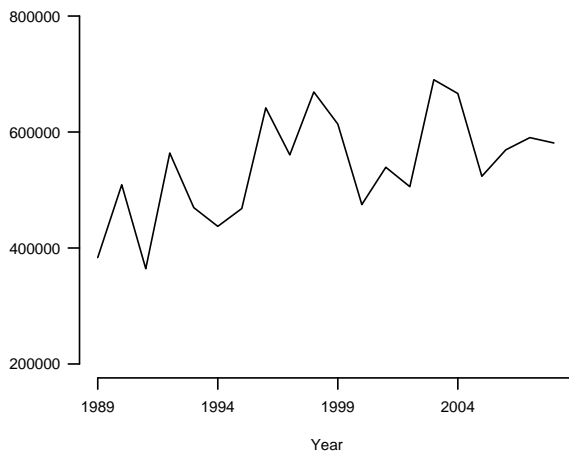
Strata 75,76 Ponds



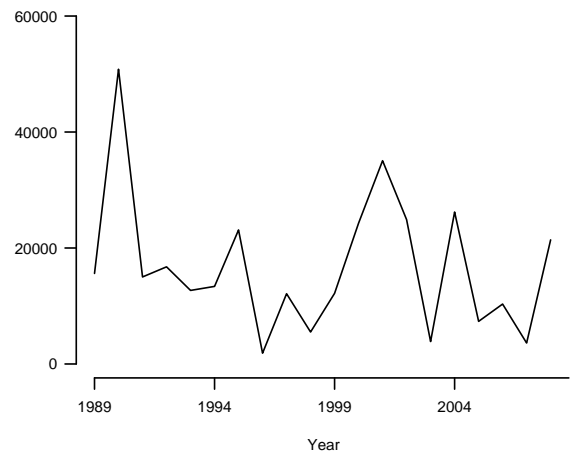
Strata 75,76 Dabblers



Strata 75,76 Divers



Strata 75,76 Miscellaneous



Strata 75,76 Total Ducks

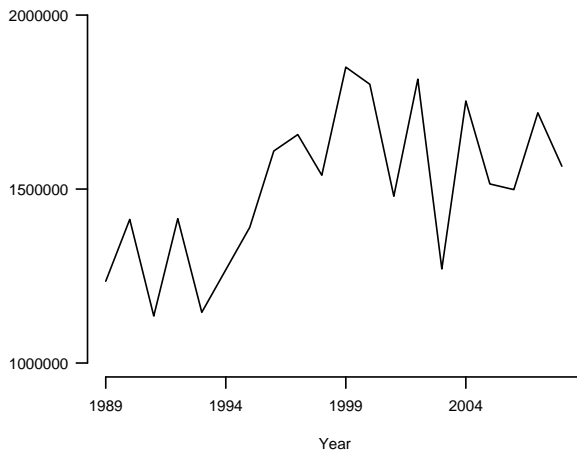


Table 6. Survey design for Central Alberta, May 2006

	<u>STRATUM</u>		
	<u>75</u>	<u>76</u>	<u>Total</u>
<u>Survey design</u>			
Square miles in stratum	19,387	26,483	45,870
Square miles in sample-waterfowl	166.5	220.5	387
Square miles in sample-ponds	83.25	110.25	193.5
Lineal miles in sample	680	882	1,548
Number of transects in sample	4	5	9
Number of segments in sample	37	49	86
Expansion factor	116.4384	120.1043	--
<u>Current year coverage</u>			
Square miles in sample-waterfowl	175.5	220.5	396
Square miles in sample-ponds	87.75	110.25	200.25
Lineal miles in sample	760	882	1584
Number of transects in sample	4	5	9
Number of segments in sample	37	49	89
Expansion factor	110.47	120.10	