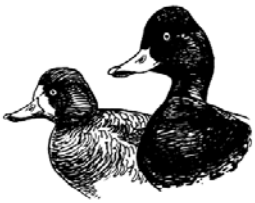
# 2001

## NORTHERN ALBERTA, NORTHEASTERN BRITISH COLUMBIA AND THE NORTHWEST TERRITORIES



The data presented in this report are preliminary. Final estimates are available from the U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Patuxent Wildlife Research Center, Laurel, Maryland 20708-4016.

TITLE: Waterfowl Breeding Population Survey for Northern Alberta, Northeastern British Columbia, and the Northwest Territories (Mackenzie District)

STRATA SURVEYED: 13, 14, 15, 16, 17, 18, 20, 77

DATE: May 25 to June 17, 2001

DATA SUPPLIED: United States Fish and Wildlife Service
Carl Ferguson, Flyway Biologist
Pat Corr, Wildlife Biologist

ABSTRACT:

Spring breeding habitat conditions for waterfowl in the survey unit, overall, were very good. The exceptions were very dry conditions in the southern portion of the unit, the Slave Lake, Peace River, and Fort McMurray areas and the late spring ice-out conditions east of Inuvik in the Northwest Territories. Above average winter precipitation and temperatures prevailed in most of the Northwest Territories surveyed area. Winter precipitation and temperatures were well below normal in the southernmost portion of the survey unit. Water levels in the Athabasca Delta wetlands remain low with the absence of spring flooding in 2001.

Overall, ducks were down 19.8 percent from 2000; dabblers were down 24.0 percent, and divers were down 17.6 percent, and miscellaneous species were down 11.8 percent. Of notable mention for the dabblers, mallards were down -38.3 percent, American wigeon were down -1.6 percent, green-winged teal were down -29.7 percent, northern shoveler were down -31.1 percent, and northern pintail were down -19.3 percent. For the divers, redhead were down -64.6 percent, canvasback were down -43.3 percent, scaup were down -12.0 percent, ring-necked duck were down -50.1 percent, goldeneye were down -46.5 percent, and bufflehead were up +27.8 percent. For miscellaneous species, oldsquaw were up +19.0 percent, scoters were down -3.3 percent, and mergansers were down -47.6 percent.

METHODS:

This survey was conducted using procedures found in the Standard Operating Procedures for Aerial Breeding Ground and Habitat Survey, Section IV (A); revised 1977. An upgraded data recording system was used again for the fourth year. This involves both the pilot/observer and the observer recording data into two Toshiba Satellite Pro 40 CDX laptop computers mounted the aircraft. GPS location “hits” were fixed to all waterfowl observed and identified. This was the second year for the observer, a retired waterfowl biologist for the Maine Department of Inland Fisheries and Wildlife. The pilot/observer has surveyed 17 years in this crew survey unit either as an observer or as a pilot/observer.

Transect flights in stratum 13 through stratum 77 were flown in N783, a Cessna 206 amphibian. The survey was initiated out of Edmonton, Alberta , beginning just north of Lesser Slave Lake on May 27, and was completed on June 17 at Norman Wells, Northwest Territories. The survey involved approximately 120 flight hours. Survey dates for individual stratum are as follows: stratum 77, May 27 - June 5; stratum 20, June 4; stratum 18, June 7 - June 11; stratum 17, June 5 - June 10; stratum 16, June 8; stratum 15, June 7 - June 11; stratum 14, June 12 - June 17; and stratum 13, June 13 - June 16. Six segments in stratum 14 were not flown due to mechanical problems with the aircraft.

## HABITAT CONDITIONS:

### Northern Alberta and Northeastern British Columbia

A lack of winter precipitation and high than average temperature resulted in extremely dry conditions in the Slave Lake, Peace River, and Fort McMurray areas. One of the largest forest fires in Alberta history was burning just south of Slave Lake when we arrived in the survey unit. On the two southernmost transects, most of the shallow drainage basins and wetlands were dried up. Beaver flowages were very reduced in acreage. Larger, more permanent lakes were the only potential nesting habitat available for waterfowl. These dry conditions persisted to about 100 miles south of High Level, Alberta. From there to the Northwest Territorial borders, wetland conditions improved as this area received much more normal winter precipitation than the area to the south. This area received some precipitation during late May and early June, but it was too little and too late to benefit nesting waterfowl.

### Athabasca Delta

During the survey period, the Delta had very low water levels this spring due to an absence of spring flooding. Many of the shallow lakes had sedges and grasses growing with reduced habitat for breeding waterfowl. Lake Baril was the lowest that I have seen in fifteen years at this time of year. Willows continue to encroach on the wetlands in the Delta, reducing the amount of habitat available for waterfowl. A large grass/brush fire was burning just east of Lake Claire during the survey period.

### Northwest Territories (Mackenzie District)

Above average amount winter precipitation resulted in idea nesting habitat conditions for waterfowl in practically all of the survey portion of the Territories. All shallow wetlands and drainage basins observed were full. Habitat-wise, this is probably as good as it gets in the northern portion of the survey unit. One drawback was the wet and cool spring weather in April and May which may lead to reduce production from early nesting waterfowl species. Spring and the subsequent ice-out arrived late in the Inuvik and area to the east.

SUMMARY:

Habitat conditions for breeding waterfowl were overall the best in several years. Drought conditions persisted in the southernmost area of the unit and spring was delayed in the extreme northeastern portion of the unit.

BREEDING POPULATION ESTIMATES:

The status of waterfowl breeding population estimates by species and stratum with comparisons to the previous year, ten-year mean, and long-term mean are presented in Table 1. The long-term trend in adjusted waterfowl breeding population estimates is presented in Appendix 1. Population indices graphs for individual waterfowl species on an annual basis are presented in Figure 1. Total ducks for 2001 indicated a -19.8 percent decrease from 2000, a -10.5 percent decrease from the ten-year mean, and a -35.2 percent decrease from the long-term mean.

Dabbler population estimates decrease -24.0 percent from 2000, decreased -7.8 percent from the ten-year mean, and decreased -27.5 percent from the long-term mean. Blue-winged teal was the only dabbler species showing an increased population estimate (+53.8 percent) from last year. The remainder of the dabblers dropped sharply, including mallard, down - 38.3; green-winged teal, down -29.7; and northern pintail, down -19.3 percent.

The breeding population estimate for divers decreased - 17.4 percent from 2000, decreased - 17.6 percent from the ten-year mean, and decreased - 38.8 percent from the long-term mean. All diver species were down sharply from last year.

For miscellaneous species, oldsquaw breeding population estimates were up +19.0 percent from 2000, but still down -21.0 percent from the ten-year mean, and down -77.1 percent from the long - term mean.

CONCLUSIONS:

1. Overall this survey unit had the best breeding habitat conditions that I have seen in several years. Habitat conditions were rated very good for most of the Northwest Territories (Mackenzie District) portion of the survey unit. The exceptions were the area around Inuvik and to the east, which experienced a late ice-out during the spring, the southern portion of the survey unit in northern Alberta and northeastern British Columbia was extremely dry with virtually no water in shallow wetlands and drainage basins. The number and size of wetlands created by beaver flowages was also drastically reduced. This area was rated as poor.

2. Waterfowl breeding pairs decreased from 2000 in this survey unit for practically all species of dabblers and divers. The exceptions were blue-winged teal, oldsquaw, and bufflehead.

3. Production this year will be lower than 2000 for dabblers and divers because fewer adult breeding pairs were present this spring and also cool and wet spring weather conditions persisted in the Northwest Territories. This will adversely affect the early waterfowl nesting species.

Submitted by: Carl Ferguson, Flyway Biologist July 23, 2001

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 Northern Alberta, Northeastern British Columbia, and the Northwest Territories.

| | Stratum | | | | | | | | | | | | % Change From | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species/Ponds | 13 | 14 | 15 | 16 | 17 | 18 | 20 | 77 | 2001 Total | 2000 Total | 10-Year Mean | Long-Term Mean | 2000 | 10-Year Mean | Long-Term Mean |
| Ducks | | | | | | | | | | | | | | | |
| Dabblers | | | | | | | | | | | | | | | |
| Mallard | 37.6 | 102.3 | 80.7 | 23.5 | 58.6 | 21.4 | 42.8 | 108.8 | 475.7 | 771.2 | 647.2 | 811.2 | -38.3% | -26.5% | -41.4% |
| Am. black duck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | -- | -- | -100.0% |
| Gadwall | 2.5 | 0.0 | 0.0 | 0.0 | 5.7 | 0.0 | 3.1 | 13.2 | 24.5 | 42.7 | 42.0 | 19.4 | -42.6% | -41.6% | 26.6% |
| Am. wigeon | 96.2 | 249.7 | 23.2 | 30.4 | 101.0 | 37.8 | 35.2 | 92.9 | 666.4 | 677.5 | 669.3 | 818.1 | -1.6% | -0.4% | -18.5% |
| Am. green-winged teal | 25.8 | 14.9 | 80.6 | 19.2 | 134.8 | 6.8 | 17.8 | 371.0 | 671.0 | 954.8 | 565.4 | 640.7 | -29.7% | 18.7% | 4.7% |
| Blue-winged teal | 0.0 | 0.0 | 0.0 | 0.0 | 14.4 | 0.0 | 6.4 | 22.4 | 43.2 | 28.1 | 98.9 | 149.2 | 53.8% | -56.3% | -71.0% |
| N. shoveler | 16.3 | 5.0 | 0.0 | 0.0 | 19.5 | 6.1 | 19.8 | 36.1 | 102.7 | 148.9 | 145.7 | 164.2 | -31.1% | -29.5% | -37.5% |
| N. pintail | 19.7 | 44.9 | 32.3 | 3.3 | 24.7 | 4.6 | 7.7 | 31.8 | 169.1 | 209.5 | 165.1 | 364.3 | -19.3% | 2.4% | -53.6% |
| Subtotal | 198.0 | 416.8 | 216.8 | 76.3 | 358.7 | 76.7 | 132.9 | 676.3 | 2152.5 | 2832.6 | 2333.5 | 2967.2 | -24.0% | -7.8% | -27.5% |
| Divers | | | | | | | | | | | | | | | |
| Redhead | 3.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 1.8 | 0.0 | 6.2 | 7.8 | 17.5 | 17.8 | -20.3% | -64.6% | -65.2% |
| Canvasback | 7.8 | 0.0 | 0.0 | 0.0 | 9.6 | 2.3 | 18.2 | 0.0 | 37.9 | 72.9 | 66.8 | 51.9 | -48.0% | -43.3% | -27.1% |
| Scaups | 66.2 | 494.6 | 185.1 | 149.9 | 191.6 | 99.5 | 0.7 | 79.1 | 1266.9 | 1440.0 | 1629.0 | 2500.0 | -12.0% | -22.2% | -49.3% |
| Ring-necked duck | 12.1 | 35.4 | 5.6 | 7.4 | 48.6 | 10.5 | 10.2 | 95.1 | 224.9 | 450.3 | 216.5 | 141.3 | -50.1% | 3.9% | 59.1% |
| Goldeneyes | 7.9 | 0.0 | 0.0 | 0.0 | 6.7 | 3.1 | 6.3 | 5.9 | 30.0 | 56.1 | 45.9 | 93.6 | -46.5% | -34.7% | -67.9% |
| Bufflehead | 1.8 | 2.1 | 14.5 | 24.3 | 98.1 | 36.5 | 2.3 | 138.3 | 317.9 | 248.8 | 290.7 | 264.7 | 27.8% | 9.4% | 20.1% |
| Ruddy Duck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 4.8 | 8.8 | 14.7 | 30.0 | 22.6 | -40.1% | -70.6% | -60.9% |
| Subtotal | 98.9 | 532.1 | 205.2 | 181.6 | 356.1 | 151.9 | 43.4 | 323.2 | 1892.5 | 2290.5 | 2296.4 | 3092.0 | -17.4% | -17.6% | -38.8% |
| Miscellaneous | | | | | | | | | | | | | | | |
| Oldsquaw | 0.0 | 30.3 | 9.3 | 12.2 | 5.6 | 0.0 | 0.0 | 0.0 | 57.3 | 48.2 | 72.6 | 250.6 | 19.0% | -21.0% | -77.1% |
| Eiders | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | -- | -- | -100.0% |
| Scoters | 15.9 | 352.1 | 50.8 | 68.2 | 25.9 | 5.0 | 0.0 | 13.2 | 531.1 | 549.0 | 500.6 | 907.0 | -3.3% | 6.1% | -41.4% |
| Mergansers | 2.4 | 42.0 | 0.0 | 20.2 | 12.4 | 0.0 | 5.1 | 8.3 | 90.4 | 172.5 | 77.6 | 73.7 | -47.6% | 16.5% | 22.8% |
| Subtotal | 18.3 | 424.4 | 60.1 | 100.6 | 43.9 | 5.0 | 5.1 | 21.5 | 678.9 | 769.6 | 650.8 | 1232.0 | -11.8% | 4.3% | -44.9% |
| Total Ducks | 315.2 | 1373.3 | 482.0 | 358.6 | 758.7 | 233.6 | 181.4 | 1021.1 | 4723.9 | 5892.7 | 5280.7 | 7291.2 | -19.8% | -10.5% | -35.2% |
| Canada Goose | 0.8 | 32.9 | 49.2 | 11.9 | 21.9 | 0.0 | 22.7 | 25.6 | 165.0 | 115.9 | 132.9 | 147.6 | 42.3% | 24.1% | 11.8% |
| Am. coot | 0.0 | 0.0 | 0.0 | 0.0 | 2.2 | 0.0 | 18.2 | 17.9 | 38.3 | 67.0 | 35.8 | 52.4 | -42.8% | 7.1% | -26.8% |

Appendix 1. Long-term trend in adjusted waterfowl breeding population estimates (thousands) for Northern Alberta, Northeastern British Columbia, and the Northwest Territories.

| Species/Ponds | 1955 | 1956 | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ducks | | | | | | | | | | |
| Dabblers | | | | | | | | | | |
| Mallard | 1299.6 | 1148.0 | 816.6 | 1019.1 | 2016.3 | 687.2 | 1862.4 | 1102.5 | 1027.7 | 1171.1 |
| Am. black duck | 0.6 | 0.6 | 0.0 | 0.0 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gadwall | 0.6 | 0.0 | 1.6 | 0.6 | 0.3 | 0.0 | 1.3 | 9.1 | 0.0 | 2.5 |
| Am. wigeon | 1331.7 | 1102.1 | 1105.7 | 724.4 | 1828.5 | 1540.0 | 1586.6 | 819.6 | 788.4 | 1185.4 |
| Am. green-winged teal | 878.0 | 675.0 | 529.0 | 643.6 | 1726.9 | 851.5 | 1067.8 | 387.3 | 874.8 | 1062.1 |
| Blue-winged teal | 204.0 | 159.2 | 25.5 | 107.5 | 360.3 | 355.7 | 385.9 | 162.9 | 34.1 | 365.2 |
| N. shoveler | 256.4 | 162.1 | 94.0 | 170.1 | 537.7 | 193.3 | 389.7 | 187.2 | 76.9 | 473.7 |
| N. pintail | 1078.4 | 608.1 | 543.8 | 920.6 | 2426.1 | 685.8 | 1226.7 | 441.3 | 298.0 | 445.1 |
| Subtotal | 5049.2 | 3855.1 | 3116.2 | 3585.9 | 8899.9 | 4313.4 | 6520.2 | 3109.9 | 3099.9 | 4705.1 |
| Divers | | | | | | | | | | |
| Redhead | 31.9 | 27.5 | 19.6 | 11.5 | 46.8 | 23.8 | 35.2 | 56.0 | 12.9 | 44.6 |
| Canvasback | 45.4 | 18.4 | 15.1 | 63.2 | 70.7 | 56.8 | 37.0 | 27.8 | 91.7 | 69.2 |
| Scaups | 2423.2 | 2297.7 | 2300.5 | 2020.8 | 3629.0 | 2347.7 | 2724.1 | 2620.7 | 2919.7 | 2572.7 |
| Ring-necked duck | 189.9 | 200.6 | 114.1 | 91.3 | 393.4 | 164.5 | 69.3 | 122.9 | 112.5 | 137.1 |
| Goldeneyes | 202.8 | 93.6 | 88.5 | 142.2 | 492.6 | 122.8 | 264.6 | 230.1 | 32.2 | 127.1 |
| Bufflehead | 156.1 | 173.7 | 152.4 | 132.2 | 238.8 | 209.7 | 160.7 | 209.2 | 151.9 | 233.9 |
| Ruddy Duck | 19.6 | 15.1 | 6.9 | 8.7 | 44.7 | 23.5 | 17.5 | 1.2 | 22.2 | 2.1 |
| Subtotal | 3068.9 | 2826.6 | 2697.1 | 2470.1 | 4916.1 | 2948.9 | 3308.3 | 3267.9 | 3343.3 | 3186.8 |
| Miscellaneous | | | | | | | | | | |
| Oldsquaw | 450.0 | 347.8 | 380.1 | 451.6 | 607.7 | 367.3 | 432.4 | 278.7 | 163.4 | 522.2 |
| Eiders | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Scoters | 1416.2 | 1219.3 | 1322.7 | 1043.0 | 1602.3 | 1606.7 | 1252.5 | 721.9 | 759.8 | 1290.2 |
| Mergansers | 101.0 | 52.5 | 74.8 | 127.2 | 95.3 | 137.4 | 131.6 | 53.2 | 94.5 | 82.5 |
| Subtotal | 1967.3 | 1619.5 | 1777.6 | 1621.8 | 2305.3 | 2111.4 | 1816.5 | 1053.8 | 1017.7 | 1894.9 |
| Total Ducks | 10085.4 | 8301.2 | 7590.9 | 7677.8 | 16121.3 | 9373.7 | 11645.0 | 7431.7 | 7460.8 | 9786.9 |
| Canada Goose | 361.6 | 414.0 | 148.6 | 285.5 | 502.8 | 264.6 | 131.3 | 90.7 | 232.5 | 17.7 |
| Am. coot | 28.2 | 3.0 | 0.0 | 0.0 | 156.8 | 3.9 | 38.8 | 19.2 | 8.7 | 7.5 |

| Species/Ponds | 1965 | 1966 | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ducks | | | | | | | | | | |
| Dabblers | | | | | | | | | | |
| Mallard | 589.9 | 675.9 | 604.6 | 730.0 | 530.8 | 753.1 | 807.6 | 1132.1 | 696.4 | 575.4 |
| Am. black duck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gadwall | 6.1 | 1.9 | 6.7 | 0.3 | 0.3 | 14.3 | 1.3 | 10.7 | 8.6 | 0.9 |
| Am. wigeon | 909.0 | 888.2 | 456.1 | 384.6 | 578.6 | 850.7 | 766.1 | 851.9 | 912.5 | 492.0 |
| Am. green-winged teal | 649.9 | 800.5 | 457.8 | 492.7 | 204.7 | 358.4 | 429.8 | 569.3 | 535.4 | 242.2 |
| Blue-winged teal | 173.3 | 52.1 | 9.6 | 5.3 | 14.7 | 21.0 | 33.0 | 81.8 | 10.0 | 31.7 |
| N. shoveler | 165.5 | 180.8 | 113.0 | 101.6 | 42.4 | 57.7 | 108.5 | 157.3 | 142.2 | 72.5 |
| N. pintail | 392.4 | 190.1 | 105.4 | 197.1 | 74.8 | 100.0 | 85.4 | 426.3 | 351.0 | 227.3 |
| Subtotal | 2886.1 | 2789.5 | 1753.2 | 1911.6 | 1446.3 | 2155.2 | 2231.7 | 3229.5 | 2656.1 | 1642.1 |
| Divers | | | | | | | | | | |
| Redhead | 6.8 | 5.0 | 18.6 | 9.5 | 5.3 | 8.3 | 6.1 | 10.3 | 5.6 | 2.9 |
| Canvasback | 44.6 | 120.5 | 21.0 | 93.0 | 61.6 | 30.4 | 40.5 | 16.8 | 21.0 | 10.4 |
| Scaups | 2607.5 | 2490.3 | 2741.4 | 1970.3 | 2523.7 | 2719.4 | 2934.8 | 5090.7 | 3328.3 | 2795.1 |
| Ring-necked duck | 225.5 | 159.6 | 133.7 | 94.3 | 54.9 | 108.4 | 105.9 | 59.7 | 106.9 | 42.2 |
| Goldeneyes | 119.3 | 34.7 | 60.3 | 24.3 | 35.0 | 17.6 | 30.7 | 33.3 | 39.3 | 36.2 |
| Bufflehead | 191.9 | 241.5 | 182.2 | 212.9 | 277.7 | 230.1 | 354.0 | 291.2 | 236.8 | 277.7 |
| Ruddy Duck | 2.1 | 17.5 | 11.1 | 0.6 | 0.9 | 1.8 | 2.5 | 15.2 | 15.0 | 6.7 |
| Subtotal | 3197.8 | 3069.1 | 3168.2 | 2404.8 | 2959.2 | 3115.9 | 3474.5 | 5517.2 | 3752.9 | 3171.2 |
| Miscellaneous | | | | | | | | | | |
| Oldsquaw | 320.8 | 460.2 | 402.3 | 165.1 | 460.3 | 283.3 | 224.6 | 105.7 | 181.4 | 218.8 |
| Eiders | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Scoters | 965.9 | 611.8 | 712.7 | 606.7 | 855.5 | 1172.6 | 640.6 | 1093.5 | 905.4 | 1098.0 |
| Mergansers | 96.9 | 52.5 | 48.4 | 14.3 | 30.2 | 44.9 | 16.1 | 29.2 | 32.1 | 21.1 |
| Subtotal | 1383.6 | 1124.5 | 1163.4 | 786.1 | 1346.0 | 1500.9 | 881.3 | 1228.4 | 1118.8 | 1338.0 |
| Total Ducks | 7467.5 | 6983.1 | 6084.8 | 5102.6 | 5751.5 | 6772.1 | 6587.5 | 9975.1 | 7527.9 | 6151.2 |
| Canada Goose | 68.7 | 152.7 | 134.4 | 70.4 | 85.3 | 131.5 | 122.4 | 111.8 | 64.4 | 38.3 |
| Am. coot | 3.4 | 35.5 | 1.0 | 43.7 | 9.8 | 4.0 | 3.2 | 6.8 | 27.0 | 29.7 |

Appendix 1 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands) for Northern Alberta, Northeastern British Columbia, and the Northwest Territories.

| Species/Ponds | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ducks | | | | | | | | | | |
| Dabblers | | | | | | | | | | |
| Mallard | 731.9 | 314.7 | 770.4 | 739.4 | 794.9 | 896.2 | 719.2 | 534.1 | 928.4 | 482.6 |
| Am. black duck | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gadwall | 0.0 | 5.2 | 17.6 | 10.2 | 32.3 | 43.8 | 52.5 | 51.0 | 2.5 | 23.1 |
| Am. wigeon | 650.3 | 538.8 | 846.7 | 993.4 | 729.6 | 992.2 | 916.0 | 589.3 | 556.3 | 1187.1 |
| Am. green-winged teal | 468.3 | 225.6 | 370.6 | 678.7 | 582.6 | 585.6 | 626.2 | 692.4 | 842.9 | 468.5 |
| Blue-winged teal | 55.9 | 111.7 | 474.5 | 213.6 | 187.2 | 367.8 | 283.9 | 159.3 | 107.5 | 92.9 |
| N. shoveler | 116.3 | 81.9 | 256.2 | 64.4 | 79.7 | 207.4 | 204.5 | 77.9 | 74.5 | 140.9 |
| N. pintail | 381.6 | 246.5 | 532.6 | 244.2 | 196.2 | 289.6 | 314.5 | 103.7 | 392.0 | 399.6 |
| Subtotal | 2404.3 | 1524.6 | 3268.6 | 2944.0 | 2602.5 | 3382.7 | 3116.8 | 2207.6 | 2904.1 | 2794.7 |
| Divers | | | | | | | | | | |
| Redhead | 2.4 | 3.1 | 23.4 | 20.2 | 12.4 | 28.7 | 18.4 | 7.2 | 9.9 | 33.8 |
| Canvasback | 32.0 | 37.6 | 48.1 | 29.9 | 28.3 | 59.6 | 113.3 | 48.7 | 55.3 | 51.6 |
| Scaups | 3215.2 | 2529.6 | 2900.0 | 2676.5 | 3166.2 | 3063.0 | 3028.7 | 2516.7 | 3230.8 | 3667.5 |
| Ring-necked duck | 73.3 | 61.9 | 179.8 | 153.5 | 90.3 | 101.7 | 94.6 | 61.2 | 101.1 | 89.1 |
| Goldeneyes | 33.6 | 47.5 | 74.5 | 112.2 | 169.7 | 184.0 | 108.2 | 74.1 | 69.5 | 298.8 |
| Bufflehead | 294.8 | 267.0 | 258.7 | 278.8 | 328.0 | 293.9 | 244.1 | 185.1 | 406.3 | 442.9 |
| Ruddy Duck | 4.0 | 1.6 | 26.8 | 8.3 | 7.8 | 19.0 | 28.8 | 23.0 | 118.2 | 51.7 |
| Subtotal | 3655.3 | 2948.2 | 3511.3 | 3279.4 | 3802.8 | 3750.0 | 3636.0 | 2916.1 | 3991.2 | 4635.3 |
| Miscellaneous | | | | | | | | | | |
| Oldsquaw | 196.2 | 176.1 | 193.7 | 180.1 | 626.4 | 322.0 | 171.8 | 193.7 | 113.0 | 601.3 |
| Eiders | 0.0 | 0.0 | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 |
| Scoters | 769.7 | 725.0 | 922.2 | 1202.6 | 1400.9 | 1101.8 | 1024.9 | 846.6 | 1077.6 | 1295.4 |
| Mergansers | 33.6 | 83.6 | 126.1 | 165.3 | 121.1 | 136.2 | 50.3 | 58.7 | 70.3 | 104.6 |
| Subtotal | 999.4 | 984.6 | 1242.0 | 1548.0 | 2151.7 | 1560.0 | 1247.0 | 1102.0 | 1260.8 | 2001.2 |
| Total Ducks | 7059.0 | 5457.5 | 8021.8 | 7771.3 | 8557.0 | 8692.7 | 7999.8 | 6225.7 | 8156.2 | 9431.2 |
| Canada Goose | 89.4 | 57.8 | 45.2 | 61.8 | 69.7 | 58.7 | 131.4 | 77.1 | 172.5 | 67.8 |
| Am. coot | 11.8 | 0.0 | 295.1 | 59.8 | 5.1 | 337.0 | 128.9 | 54.8 | 133.9 | 47.1 |

| Species/Ponds | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ducks | | | | | | | | | | |
| Dabblers | | | | | | | | | | |
| Mallard | 632.2 | 1194.9 | 705.4 | 1006.8 | 581.6 | 565.9 | 536.0 | 501.4 | 595.1 | 350.5 |
| Am. black duck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gadwall | 13.7 | 48.9 | 13.0 | 18.3 | 28.1 | 44.1 | 49.9 | 58.0 | 48.8 | 42.6 |
| Am. wigeon | 692.2 | 469.7 | 832.3 | 818.5 | 598.6 | 426.7 | 687.4 | 580.9 | 652.1 | 382.2 |
| Am. green-winged teal | 615.6 | 765.6 | 991.9 | 882.9 | 905.7 | 677.1 | 396.1 | 485.0 | 488.4 | 575.5 |
| Blue-winged teal | 118.4 | 382.2 | 250.6 | 370.5 | 76.3 | 29.2 | 79.9 | 156.6 | 205.0 | 99.1 |
| N. shoveler | 108.9 | 204.8 | 210.2 | 239.5 | 184.6 | 160.6 | 160.9 | 184.1 | 216.5 | 101.7 |
| N. pintail | 276.3 | 175.7 | 218.9 | 188.2 | 178.2 | 146.6 | 218.3 | 266.7 | 226.0 | 92.3 |
| Subtotal | 2457.3 | 3241.8 | 3222.4 | 3524.7 | 2553.0 | 2050.1 | 2128.4 | 2232.7 | 2431.9 | 1643.9 |
| Divers | | | | | | | | | | |
| Redhead | 9.8 | 30.6 | 4.9 | 15.7 | 20.1 | 16.0 | 40.0 | 10.6 | 40.8 | 7.9 |
| Canvasback | 14.1 | 47.1 | 27.8 | 61.5 | 81.1 | 30.0 | 74.5 | 46.8 | 68.9 | 27.0 |
| Scaups | 2375.4 | 2315.4 | 2518.1 | 2267.3 | 2339.3 | 1843.2 | 1936.5 | 1658.2 | 1701.9 | 1845.7 |
| Ring-necked duck | 80.5 | 64.8 | 90.9 | 164.2 | 127.5 | 114.8 | 113.7 | 106.9 | 184.2 | 136.8 |
| Goldeneyes | 93.9 | 149.2 | 42.2 | 53.3 | 76.6 | 30.8 | 39.8 | 44.1 | 51.0 | 96.9 |
| Bufflehead | 249.1 | 318.2 | 386.2 | 370.5 | 358.6 | 272.7 | 264.3 | 208.5 | 247.6 | 310.7 |
| Ruddy Duck | 16.2 | 92.9 | 8.6 | 17.8 | 44.5 | 34.7 | 38.4 | 43.5 | 59.6 | 7.7 |
| Subtotal | 2839.0 | 3018.2 | 3078.8 | 2950.2 | 3047.7 | 2342.3 | 2507.1 | 2118.6 | 2353.8 | 2432.7 |
| Miscellaneous | | | | | | | | | | |
| Oldsquaw | 267.7 | 113.7 | 270.2 | 231.1 | 279.3 | 43.6 | 76.3 | 47.0 | 64.6 | 79.1 |
| Eiders | 16.2 | 2.9 | 0.0 | 2.0 | 4.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Scoters | 1045.4 | 909.0 | 1188.9 | 748.6 | 1129.0 | 432.7 | 647.4 | 549.1 | 633.8 | 372.6 |
| Mergansers | 69.9 | 31.9 | 64.2 | 40.9 | 67.9 | 52.2 | 42.3 | 119.9 | 61.8 | 106.7 |
| Subtotal | 1399.3 | 1057.5 | 1523.3 | 1022.6 | 1480.8 | 528.5 | 765.9 | 716.0 | 760.2 | 558.4 |
| Total Ducks | 6695.5 | 7317.5 | 7824.4 | 7497.6 | 7081.4 | 4920.9 | 5401.5 | 5067.3 | 5545.9 | 4634.9 |
| Canada Goose | 172.8 | 163.9 | 326.5 | 261.6 | 154.0 | 120.2 | 161.4 | 144.5 | 174.9 | 93.0 |
| Am. coot | 47.8 | 32.0 | 70.1 | 227.8 | 131.7 | 38.4 | 70.9 | 51.0 | 29.9 | 10.7 |

Appendix 1 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands) for Northern Alberta, Northeastern British Columbia, and the Northwest Territories.

| Species/Ponds | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|---|---|---|
| Ducks | | | | | | | |
| Dabblers | | | | | | | |
| Mallard | 576.5 | 295.1 | 773.7 | 671.8 | 1400.3 | 771.2 | 475.7 |
| Am. black duck | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gadwall | 34.3 | 9.6 | 24.4 | 39.9 | 69.9 | 42.7 | 24.5 |
| Am. wigeon | 694.8 | 394.0 | 983.7 | 687.2 | 952.8 | 677.5 | 666.4 |
| Am. green-winged teal | 605.5 | 281.7 | 440.2 | 616.4 | 810.4 | 954.8 | 671.0 |
| Blue-winged teal | 90.0 | 30.9 | 86.8 | 156.6 | 56.2 | 28.1 | 43.2 |
| N. shoveler | 65.0 | 41.7 | 90.9 | 306.9 | 140.6 | 148.9 | 102.7 |
| N. pintail | 88.4 | 38.3 | 175.1 | 173.1 | 162.9 | 209.5 | 169.1 |
| Subtotal | 2154.5 | 1091.3 | 2574.8 | 2651.9 | 3593.0 | 2832.6 | 2152.5 |
| Divers | | | | | | | |
| Redhead | 6.6 | 5.5 | 26.7 | 17.4 | 11.9 | 7.8 | 6.2 |
| Canvasback | 109.6 | 45.6 | 66.7 | 39.1 | 116.9 | 72.9 | 37.9 |
| Scaups | 1657.9 | 1294.4 | 1473.4 | 1355.4 | 1926.6 | 1440.0 | 1266.9 |
| Ring-necked duck | 125.1 | 99.3 | 359.5 | 285.4 | 303.9 | 450.3 | 224.9 |
| Goldeneyes | 31.0 | 22.9 | 17.5 | 55.7 | 44.2 | 56.1 | 30.0 |
| Bufflehead | 323.1 | 235.1 | 387.9 | 269.9 | 410.9 | 248.8 | 317.9 |
| Ruddy Duck | 15.2 | 10.4 | 24.0 | 16.1 | 70.5 | 14.7 | 8.8 |
| Subtotal | 2268.5 | 1713.2 | 2355.6 | 2038.8 | 2885.0 | 2290.5 | 1892.5 |
| Miscellaneous | | | | | | | |
| Oldsquaw | 93.7 | 47.1 | 107.7 | 50.5 | 111.6 | 48.2 | 57.3 |
| Eiders | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Scoters | 407.2 | 359.9 | 679.0 | 282.9 | 525.2 | 549.0 | 531.1 |
| Mergansers | 59.5 | 30.6 | 49.1 | 47.3 | 86.7 | 172.5 | 90.4 |
| Subtotal | 560.4 | 437.6 | 835.8 | 380.6 | 723.6 | 769.6 | 678.9 |
| Total Ducks | 4983.4 | 3242.0 | 5766.1 | 5071.4 | 7201.6 | 5892.7 | 4723.9 |
| Canada Goose | 162.4 | 151.8 | 79.1 | 82.2 | 163.8 | 115.9 | 165.0 |
| Am. coot | 5.6 | 3.6 | 10.6 | 91.7 | 17.1 | 67.0 | 38.3 |

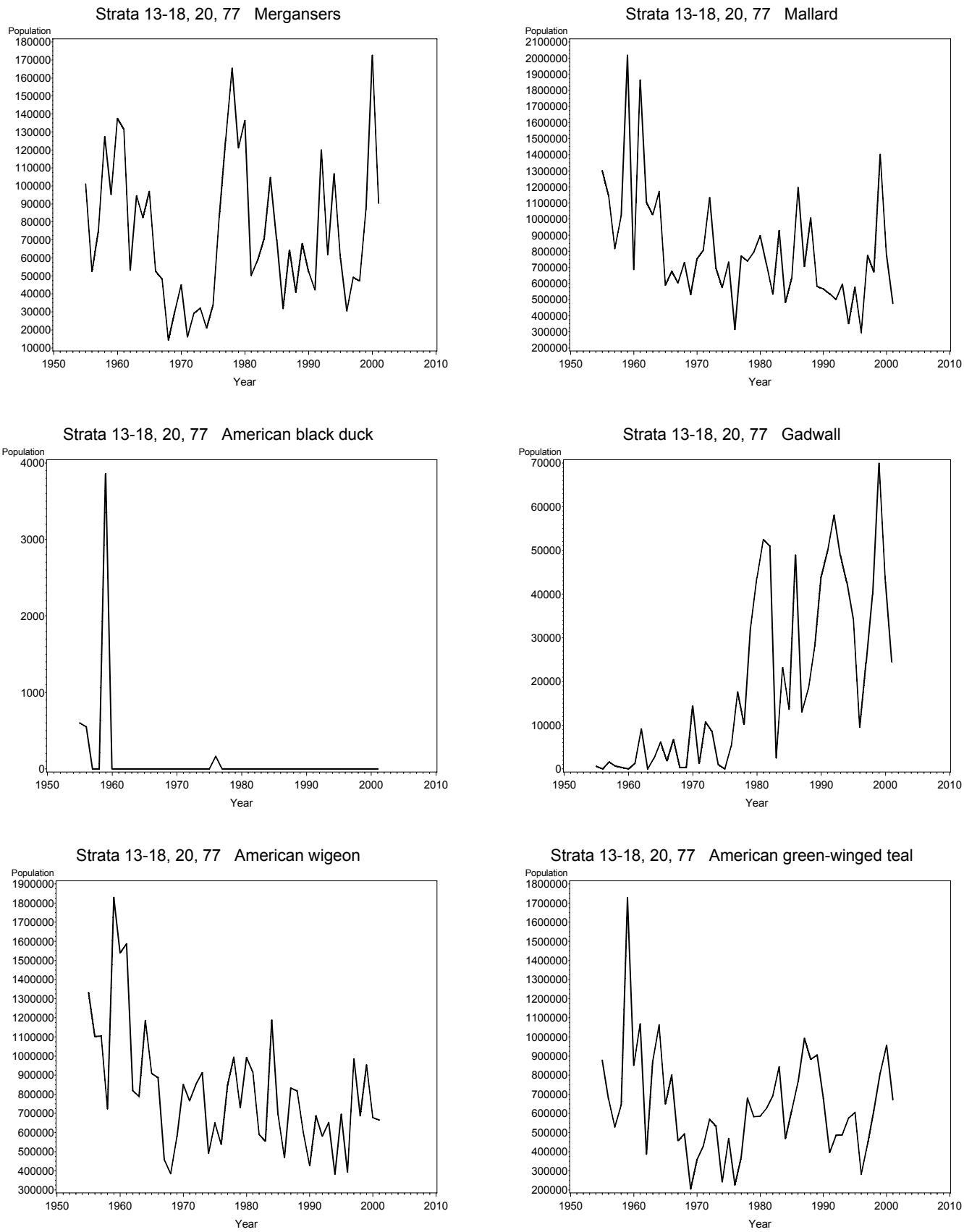
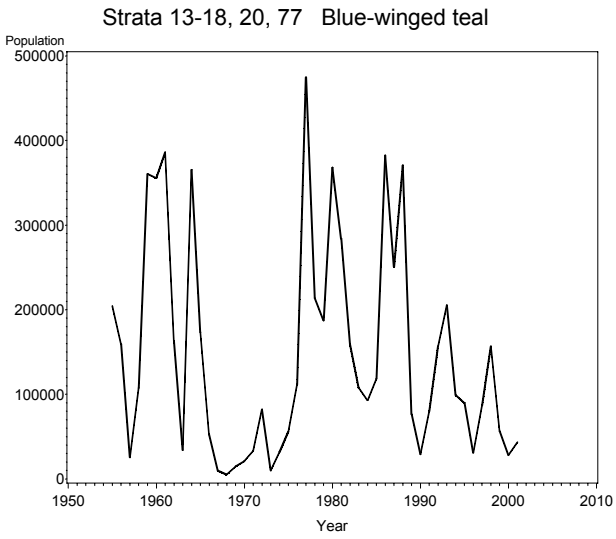
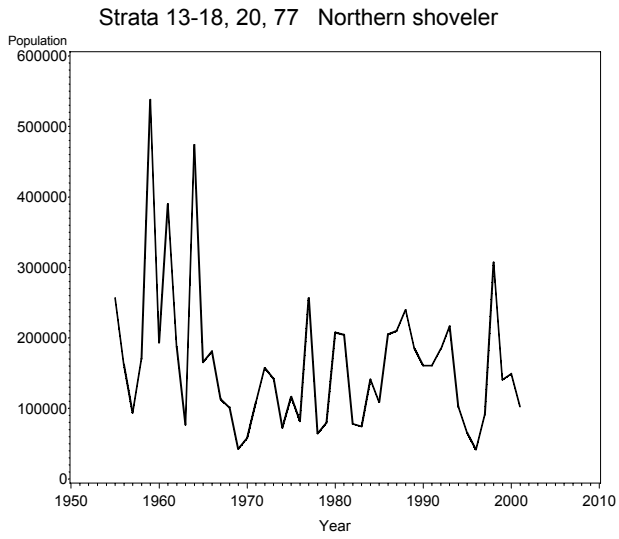
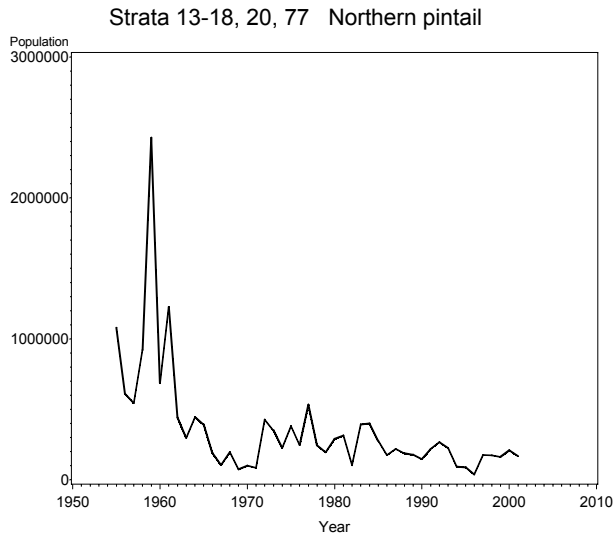
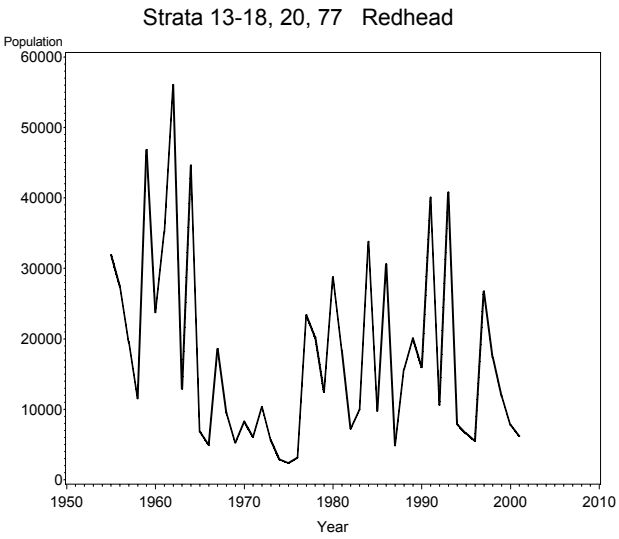


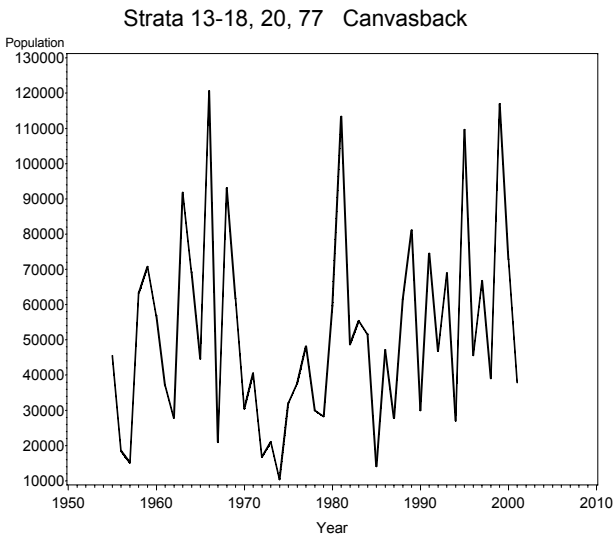

Figure 1. Population indices for the individual waterfowl species on an annual basis.



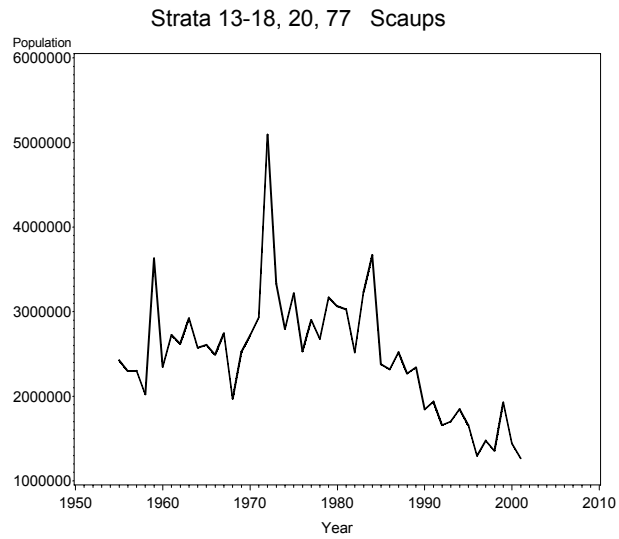
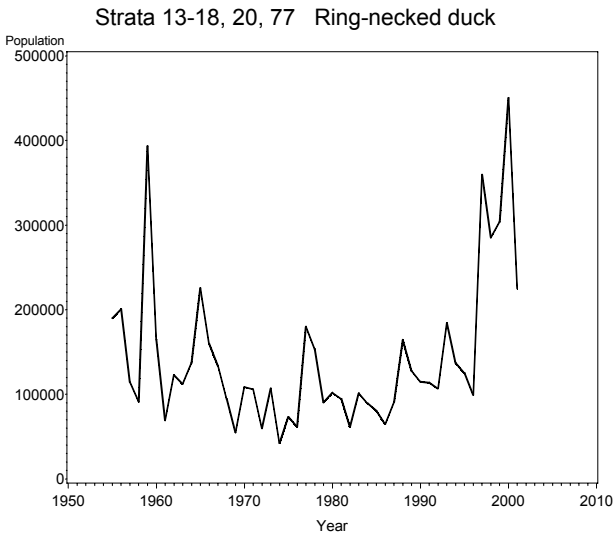
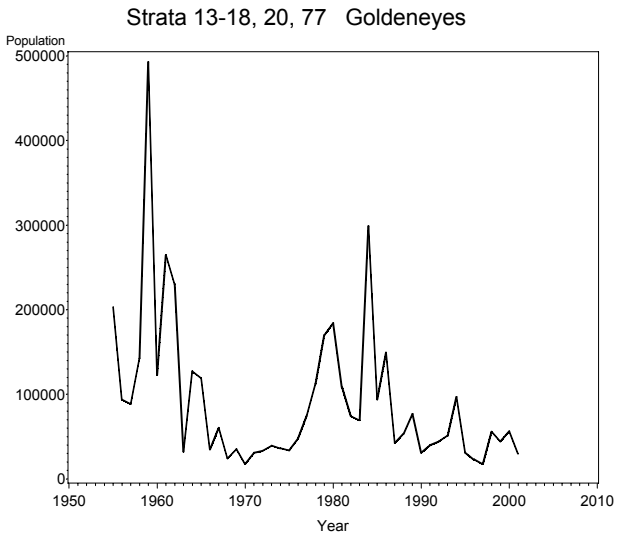
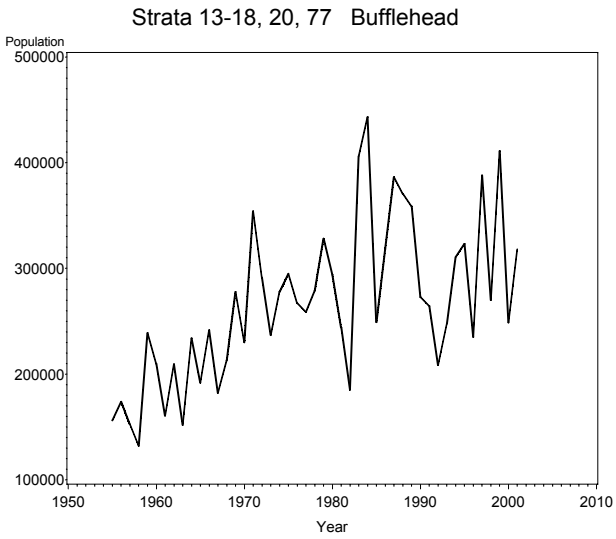
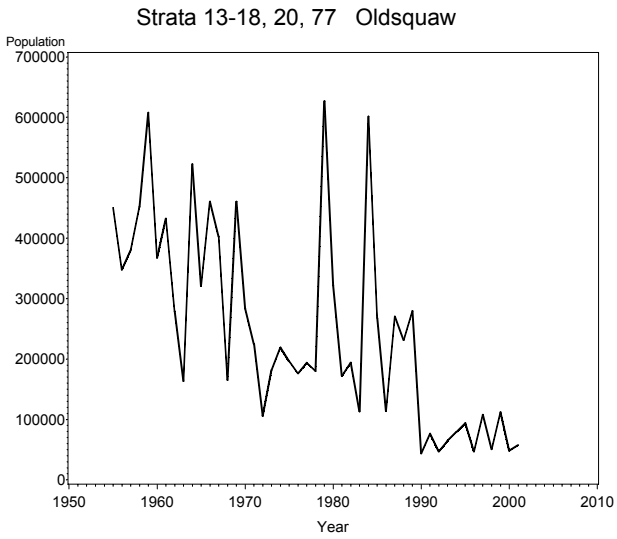



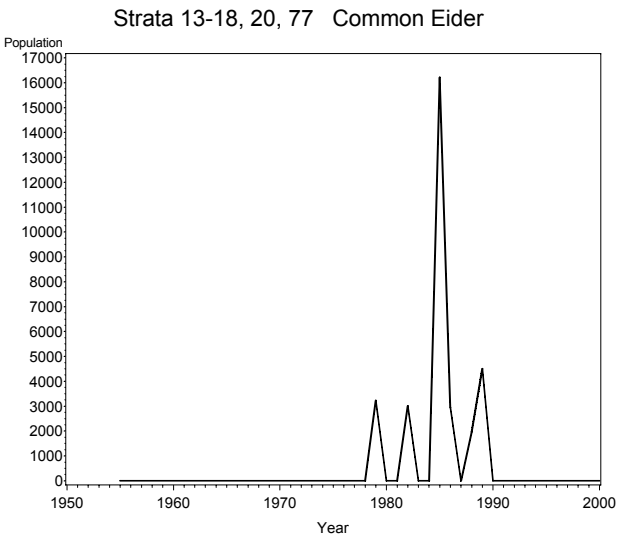

Figure 1 continued.

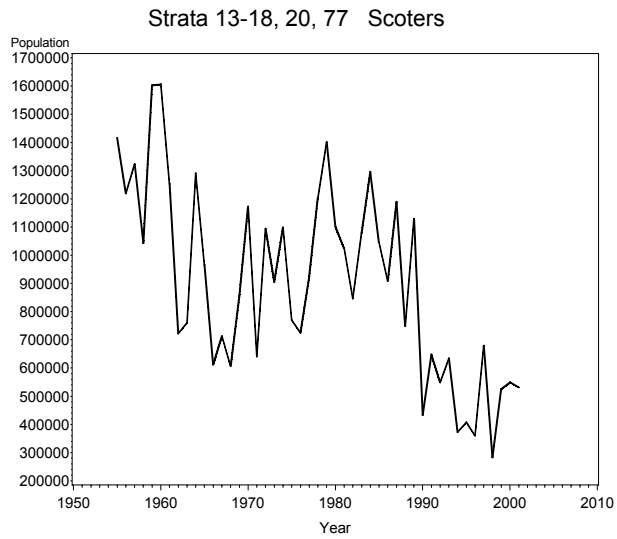
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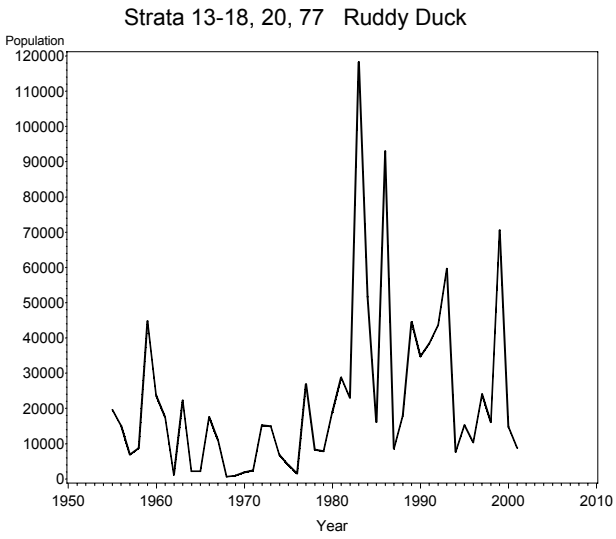


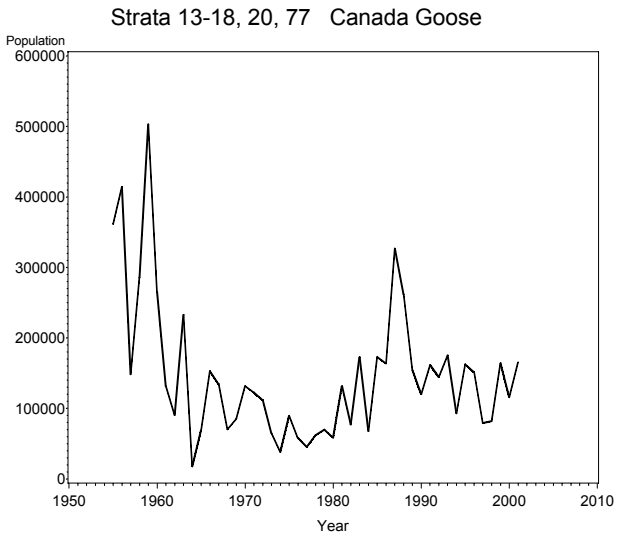


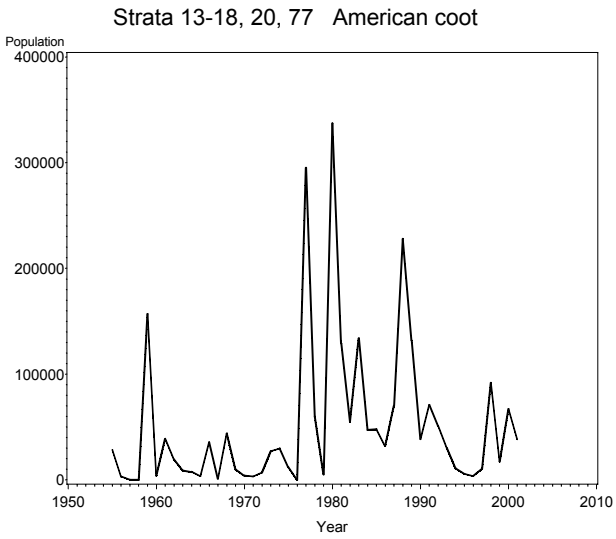


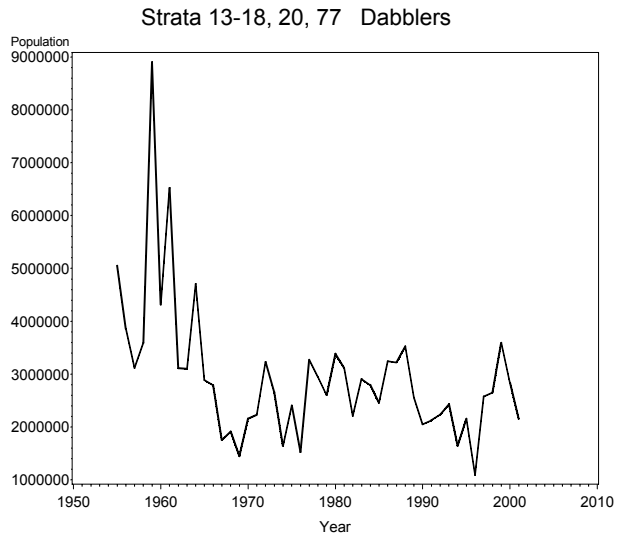


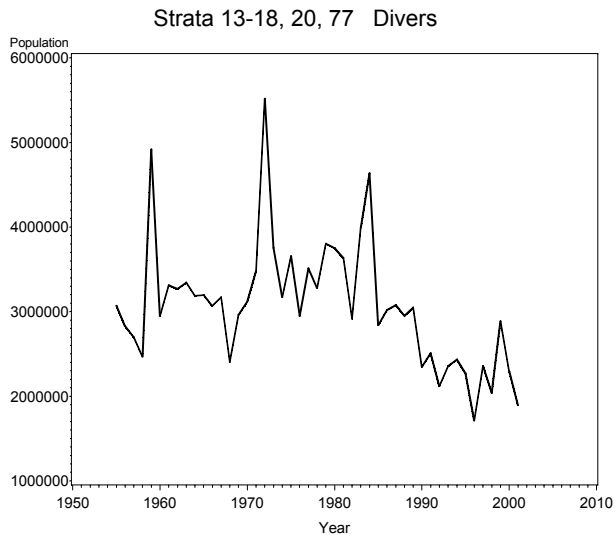


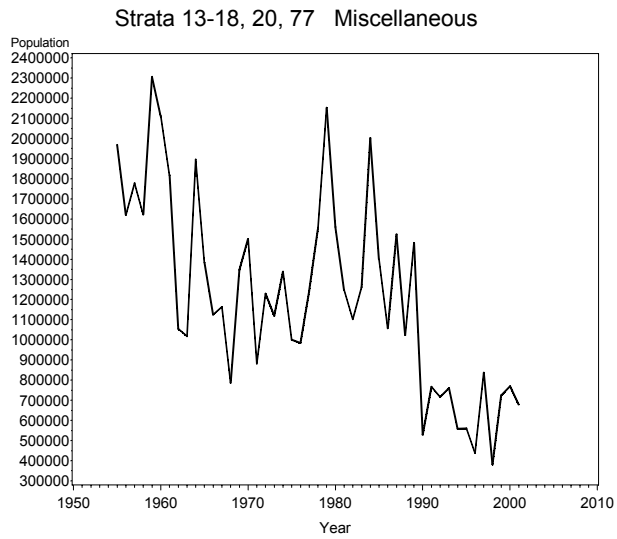


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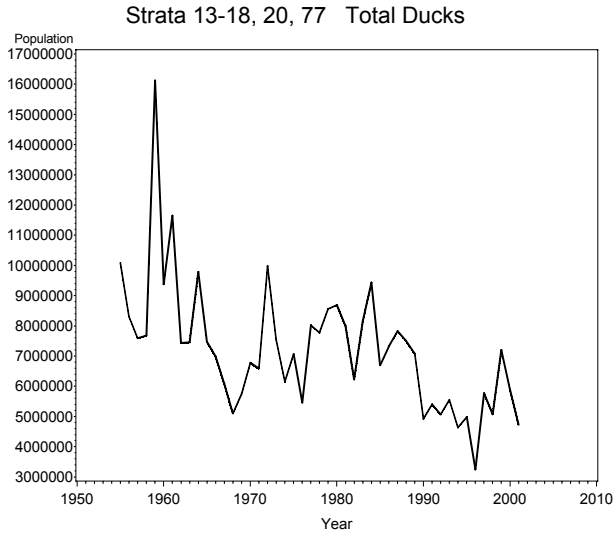


Figure 1 continued.