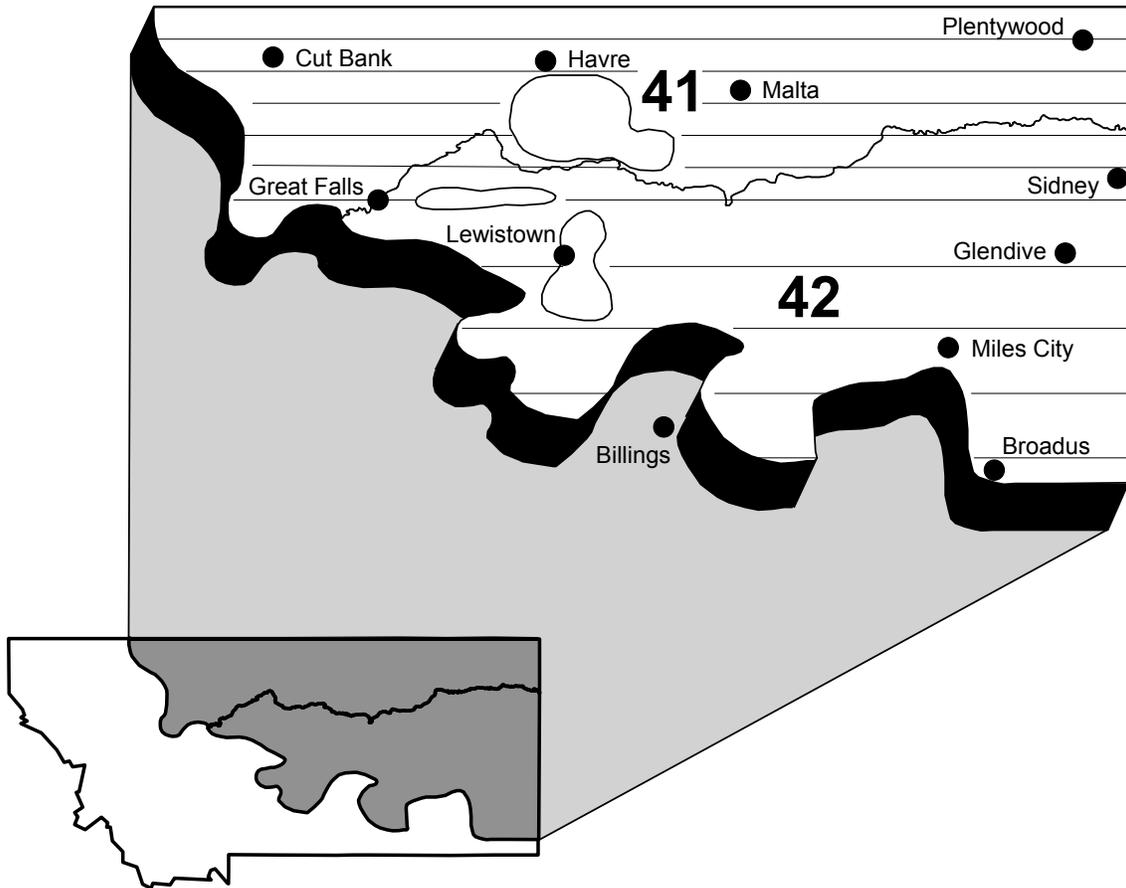


Waterfowl Breeding Population Survey
for

MONTANA



2005

Title: Waterfowl Breeding Population Survey for Montana

Strata Surveyed: 41 and 42

Dates: May 3-19, 2005

Data Supplied by: U.S. Fish and Wildlife Service (USFWS)
Division of Migratory Bird Management (WPS)

Aerial Crew:

Pilot/Observer: Ray Bentley
Flyway Biologist, USFWS/DMBM
Corvallis, OR

Observer: Helen E. Woods
Wildlife Biologist TR USFWS/DMBM
Laurel, MD

Ground Crew:

Leader: Ken Richkus, USFWS/DMBM
Wildlife Biologist, DMBM
Laurel, MD

Assistant: Troy Wilkendorf, USFWS
Transportation Assistant, USFWS
Portland, OR

Abstract:

The 2005 waterfowl breeding population survey for Montana was completed on May 19 with all transects and segments covered as outlined in the survey design. A general improvement of habitat conditions was in progress during the survey period following a mild winter and dry early spring. The region was initially under the influence of a continuing and at first worsening drought. Near record precipitation during the latter parts of the survey served to mitigate conditions with pond numbers 30% above 2004 and 40% above long term means. Upland vegetation responded well to the increased precipitation with relatively dramatic green up occurring by May 15. Waterfowl numbers however failed to respond positively on such a short term basis. Nearly all species were below 2004 observations as well as long term means. Mallard estimates were 38% below the long term mean with a similar deviation from 2004. In general dabbler species were 27% below the long term mean while diver species fair worse at 63% below the long term mean. While the addition of much needed moisture to the region served to improve habitat conditions greatly and will provide good brood habitat, it occurred late in the overall breeding season affecting where or if a specific pair chose to initiate a nesting

effort. The outlook for eastern Montana is for less than average waterfowl production partially offset by expected good brood survival.

Methods:

Procedures followed in conducting this survey are described in the Standard Operating Procedures for Aerial Breeding Ground Surveys in North America, Section III, revised 2003. The survey design for Montana included 14 air/ground comparison segments comprising 5.7% of the total 193 segments flown. All segments specified in the survey design were counted (Table 3).

Air and ground crew members met in Pierre SD on April 28. On April 29 ground crew training and ground reconnaissance for waterfowl breeding status was conducted north of Pierre. Aerial observer training was conducted on May 1 and 2 with additional training sessions during en route phases of survey flights. Aerial surveys were initiated on May 3 and continued through May 19. Flights were canceled on May 8, 10, 11, 12, and 17 due to adverse weather conditions. Data files and habitat summaries for stratum 43 and 44 (Western Dakotas) were submitted to John Solberg (USFWS) for inclusion in the overall Dakotas report.

A single engine Cessna 182R (N702) was used to conduct surveys over approximately 63 flight hours. Survey personnel included Ray Bentley as pilot/observer, Helen Woods as observer, Ken Richkus as ground crew leader, and Troy Wilkendorf as ground crew assistant. 2005 served as Ray's 5th season flying in Montana and Helen's first. This was Ken's 3rd year as ground crew leader and Troy's first year as assistant.

As in other years aerial crews utilized on-board laptop computers, interfaced with the aircraft's GPS for data recording. Geo-referenced data files were generated after daily transcription with compilation and summaries conducted using software developed by Jack Hodges, USFWS/DMBM, Juneau, AK. Processed data files were submitted to Mark Otto, Population and Habitat Assessment Section (PHAS) USFWS/DMBM and to Khristi Wilkins (PHAS) in Laurel, MD for application of visibility correction factors and table generation.

Weather and Habitat Conditions:

Eastern Montana experienced a dry fall of 2004, a mild winter and by mid April 2005 remained under the influence of a continued drought. Both the Palmer Drought Index (PDI) and the Standardized Precipitation Index (SPI) rated the survey area as under severe to extreme drought by late April. While the SPI only examines precipitation the PDI includes soil moisture, evapo-transpiration, and runoff. Communications with Mr. James Hansen of Montana Fish Wildlife and Parks (Billings, MT) in April seemed to at least partially support the drought severity rating for early spring conditions and initial aerial reconnaissance of habitat in the southern portion of strata 42 showed mostly dry basins, little semi-permanent wetlands, and generally poor waterfowl breeding potential. By early May however several storm systems had begun to impact the region. Eastern Montana is often a mosaic of areas of wet vs. dry. Weather at a given drainage is favorable to waterfowl production can be largely dependent on the ground track of storm systems

and their resulting spring precipitation. It is common to observe relatively poor habitat adjacent to relatively favorable habitat in as little as 30 miles of transect survey. By May 10 a significant amount of snow followed by rain had affected the region, particularly strata 41. Flood warnings were in effect near Great Falls, ground observers reported near 10" of snow near Miles City, and nearly all of strata 41 and 42 received precipitation over a 4 day period. Upland cover responded quickly following runoff and snow melt with dramatic green up of what weeks earlier had been quite parched. Nearly all basins were full, creeks flowing, and sheet water present in agricultural lands. In the days following this event many creeks returned to low flow state and predictably sheet water disappeared. The effects of May precipitation on waterfowl breeding potential will largely depend on late nesting effort and if normal rainfall continues to improve conditions. Given the initial soil moisture deficit it is felt that the May precipitation served to only semi mitigate what would have been a very marginal situation for waterfowl breeding.

Stratum 41 (North of the Missouri River)

This region showed pond estimates at 187,900 a 17% increase from 2004 values. This represents a 30% increase from the 10-year mean and 50% increase from the long term mean. This apparent increase in pond density concurs with late May PDI and SPI ratings of drought severity in that by early spring conditions were extremely dry but by late spring precipitation was well above normal. Overall eastern Montana entered 2005 with 41% of normal precipitation but within 5 months had received 63% of its annual precipitation. The late spring rain resulted in a salvaging effect of what was predicted to be a dismal year for upland vegetation however by the time wetland basins were full waterfowl had largely either established or moved on. The moisture deficit resulting from the past 3 years of drought greatly reduced the positive effects of what would be considered a relatively wet mid-spring in northeastern Montana. While pond numbers by themselves were greater than previous years the late arrival of moisture did little to enhance waterfowl breeding potential. Late nesting and re-nesting efforts should experience much more favorable conditions.

Stratum 42 (South of the Missouri River)

The surveyed portion south of the Missouri River showed a 36% increase in pond estimates from 2004 at 185,100 with similar comparisons to 10 year and long term means. Like the region to the north southeastern Montana experienced a mild winter with precipitation levels well below average. This was a continuation of a 3+ year drought and initial prospects for waterfowl habitat were unfavorable. By mid May however the area had received significant precipitation to the point of actually being above normal for short term indices. On-site examination showed basins full from both run-off and direct rainfall with good response in upland vegetation. However it appears the addition of moisture occurred at a time when breeding waterfowl had already committed to either a nest attempt or abandoned efforts possibly in favor of more northern latitudes. Aerial and ground observations showed an improvement in wetland numbers even within the survey time span however due to the timing it is felt that only late nesters will benefit with little improvement in waterfowl breeding potential.

Breeding Population Estimates

Initial ground reconnaissance and subsequent pre-survey aerial observation indicated the survey timing was appropriate with all key expected species present exhibiting paired behavior and or territorial defense. Crowding did not seem to be as prevalent as in recent years and the instances of open water flocks were reduced.

Population estimates for dabbling species totaled 622,400 (Table 1) a 23% decrease from 2004. This year's total dabbling estimate is 27% below the long term mean. Nearly all species showed a decline from 2004 as well as negative departures from 10 year and long term mean estimates. Mallard estimates were 32% below 2004 and 38% below the long term mean. Of particular note were Northern pintail whose 2005 estimate was 41% below 04 and over 70% below the long term mean. American widgeon estimates remained similar to 04 but still falling below long term mean values by 45%. Gadwall also remained similar to 04 yet short of the long term and 10-year mean.

Population estimates for diving ducks showed a 57% decline from 2004 at 22,600. Scaup, the most frequently observed species, showed a 21% decline from 04 with an expanded estimate of 12,800 and a continued 64% decline from the long term mean. Very infrequently observed species showed large percentage declines and increases likely a result of low sample size.

Canada goose estimates were similar to 2004 and again well above the long term mean by 33%. The 2005 estimates are 13% below the 10-year mean which is still influenced by favorable conditions and rapid increases in goose populations in the late 90s.

American coot population estimates were well below 2004(-88%) and below the 10-year and long term mean estimates.

As in previous surveys waterfowl population estimates were greater in stratum 41 than in stratum 42. This difference was consistent among all species with the exception of Canada goose. The largest variation in estimates between the two regions occurs with Northern pintail with gadwall being nearly identical.

Graphs #1 through #26 provide visual depiction of trends in waterfowl population estimates over long term.

Conclusions:

Observations in 2005 reveal a region under the effects of a four year drought with recent improvement in habitat conditions. Significant change was noted from the initiation of the survey in early May through mid May. Initial predictions were for extreme drought in most of eastern Montana with little prospect for improvements in waterfowl breeding potential from 2004. Aerial and ground surveys revealed this to be the case at the start of the surveys but significant increases in precipitation beginning the 2nd week of May served to bring pond numbers up to and exceeding 2004 as well as 10 year and long term mean values. Normally some anomalies in pond estimates are apparent in this region with

the drying of stream and river channels creating many small water bodies in place of a continuous channel. In 2005 this did not appear to be the case and increases in pond density was more a reflection of record rainfall and runoff creating flooded basins meeting the criteria of class III wetland. By May 19 upland vegetation had responded well to precipitation events converting what was a rather sparse landscape into one much more favorable to successful waterfowl breeding. Unfortunately the eventual addition of moisture to the system occurred somewhat late in the breeding chronology of most species serving only to make the landscape appear favorable after the waterfowl resource had committed to a given nesting effort. Observations of actual waterfowl breeding effort showed marked declines from 2004 and negative departures for most species from the 10-year and long term means. Ground searches supported aerial observations with normal visibility correction factors further indicating a general decline in waterfowl numbers for both strata. An overall 27% decline in dabbling species from the long term mean despite late season improvements to habitat show that in addition to moisture, timing is critical to the waterfowl breeding potential scenario. The 70% decline in Northern pintail from the long term mean is evidence that the species continues, at least in this region, to be significantly depressed in breeding potential and recovery. Teal seem to be partially adjusting to conditions of prolonged drought but in general all other species failed to show positive trends from both long term indices and from the previous year. The same holds true for diving species with certain anomalies suspected in estimates of infrequently encountered species such as ruddy duck and bufflehead. In both of the latter species while likely fewer in number than 2004 and long term databases it is suspected that the percentage changes are exaggerated partially due to small sample size. Canada goose breeding effort continues to remain strong with increases over 2004 and the long term mean. In general habitat conditions improved greatly during the survey period serving to partially mitigate what was expected to be an extremely poor year. However these improvements occurred late in the waterfowl breeding cycle with the waterfowl resource failing to respond in a positive manner. Some late season nesting species and the few re-nesters will likely fair much better however waterfowl breeding potential was below average and is expected to remain so.

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

Species/Ponds	Stratum		2005 Total	2004 Total	10-Year Mean	Long- Term Mean	% Change From		
	41	42					2004	10-Year Mean	Long- Term Mean
Ducks									
Dabblers									
Mallard	115.7	61.8	177.5	262.8	353.4	288.5	-32.4%	-49.8%	-38.5%
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Gadwall	47.6	46.7	94.3	101.3	211.5	115.7	-6.9%	-55.4%	-18.5%
Am. wigeon	30.3	13.3	43.6	42.8	69.7	80.1	2.0%	-37.4%	-45.5%
Am. green-winged teal	23.1	11.4	34.5	56.4	36.7	23.4	-38.8%	-5.9%	47.3%
Blue-winged teal	97.5	46.6	144.1	145.9	130.2	100.7	-1.2%	10.7%	43.2%
N. shoveler	56.5	26.2	82.7	125.6	123.3	93.7	-34.2%	-32.9%	-11.8%
N. pintail	38.3	7.3	45.6	77.9	110.0	152.9	-41.5%	-58.5%	-70.2%
Subtotal	409.0	213.4	622.4	812.7	1034.7	855.0	-23.4%	-39.8%	-27.2%
Divers									
Redhead	1.2	0.0	1.2	11.2	7.0	6.3	-89.3%	-82.8%	-80.9%
Canvasback	2.9	0.5	3.4	10.4	6.4	5.7	-67.3%	-46.7%	-40.1%
Scaups	8.8	4.0	12.8	16.3	25.6	35.9	-21.2%	-49.8%	-64.2%
Ring-necked duck	1.8	0.0	1.8	3.0	1.9	2.3	-40.9%	-8.5%	-23.9%
Goldeneyes	0.0	0.0	0.0	0.5	0.6	0.8	-100.0%	-100.0%	-100.0%
Bufflehead	1.9	1.1	3.0	0.6	1.0	1.4	368.6%	216.3%	121.3%
Ruddy Duck	0.3	0.0	0.3	10.2	10.7	8.6	-96.7%	-96.8%	-96.0%
Subtotal	17.0	5.6	22.6	52.2	53.1	60.9	-56.8%	-57.5%	-62.9%
Miscellaneous									
Long-tailed duck	0.0	0.0	0.0	0.0	0.1	0.0	--	-100.0%	-100.0%
Eiders	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Scoters	0.0	0.0	0.0	0.0	0.1	0.0	--	-100.0%	-100.0%
Mergansers	0.5	1.3	1.9	1.3	4.6	2.5	38.1%	-60.1%	-26.1%
Subtotal	0.5	1.3	1.9	1.3	4.8	2.6	38.1%	-61.6%	-27.7%
Total Ducks	426.5	220.3	646.8	866.3	1092.6	918.5	-25.3%	-40.8%	-29.6%
Canada Goose	29.1	44.8	73.9	70.9	84.7	55.4	4.2%	-12.7%	33.3%
Am. coot	3.2	2.0	5.1	43.4	52.8	62.0	-88.2%	-90.3%	-91.7%
Ponds	187.9	185.1	373.0	297.3	279.0	258.6	25.5%	33.7%	44.3%

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 Montana.

Year	Stratum		Total
	41	42	
1974	142.4	66.9	209.2
1975	150.6	128.8	279.4
1976	109.3	126.3	235.5
1977	70.4	88.2	158.6
1978	145.7	156.2	301.9
1979	135.0	106.2	241.2
1980	77.9	74.4	152.3
1981	103.3	73.0	176.3
1982	147.1	126.5	273.5
1983	85.2	88.7	173.9
1984	88.6	117.5	206.2
1985	127.3	160.0	287.3
1986	190.4	206.3	396.7
1987	102.2	127.1	229.3
1988	78.3	92.0	170.3
1989	160.5	177.3	337.8
1990	121.7	124.3	246.0
1991	111.6	130.1	241.6
1992	95.6	140.0	235.5
1993	94.3	100.5	194.8
1994	227.4	251.1	478.5
1995	164.1	184.7	348.8
1996	209.4	174.7	384.1
1997	154.3	160.2	314.5
1998	149.4	176.0	325.4
1999	227.6	149.8	377.3
2000	74.6	88.0	162.6
2001	74.2	79.7	154.0
2002	71.3	93.4	164.7
2003	136.4	124.4	260.8
2004	161.5	135.8	297.3
2005	187.9	185.1	373.0
10-year Mean	142.3	136.7	279.0
Long-term Mean	128.6	129.9	258.6
Percent Change:			
From 2004	0.2	0.4	0.3
From 10-year Mean	0.3	0.4	0.3
From Long-term Mean	0.5	0.4	0.4

Table 3. Montana - Stratum data sheet, May 2005

	strata	
Survey Design	41	42
Square miles in the stratum	32,902	40,755
Square miles in sample	504	365
Linear miles in sample	2,016	1.458
Number of transects in sample	7	7
Number of segments in sample	112	81
Expansion factor	65.2817	111.8107

	strata	
Current Year Design	41	42
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Linear miles in sample	2,016	1.458
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Expansion factor	65.2817	111.8107

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

Species/Ponds	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Ducks										
Dabblers										
Mallard	363.3	489.4	320.9	198.5	291.3	311.5	273.9	374.2	261.3	198.2
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	147.9	130.5	100.0	93.7	94.3	53.3	49.1	15.5	11.8	69.6
Am. wigeon	36.8	43.2	63.6	68.6	85.8	92.6	58.3	129.8	99.2	76.8
Am. green-winged teal	22.5	18.4	29.9	20.5	8.6	28.2	11.5	31.7	51.5	21.9
Blue-winged teal	137.5	133.3	82.9	53.2	149.9	99.3	87.1	17.0	8.5	77.7
N. shoveler	65.7	83.1	98.6	78.0	109.6	64.9	65.5	61.1	47.2	58.1
N. pintail	287.4	262.9	277.3	72.2	156.4	191.2	124.3	240.6	167.7	116.8
Subtotal	1061.2	1160.7	973.1	584.9	895.9	840.9	669.7	870.0	647.3	619.2
Divers										
Redhead	2.6	4.2	12.4	1.4	2.6	2.0	2.4	0.0	2.4	1.0
Canvasback	3.1	0.5	1.6	3.5	5.5	3.6	5.6	6.7	9.6	1.3
Scaups	27.8	44.7	43.0	27.0	50.0	33.2	15.6	39.5	49.2	35.8
Ring-necked duck	3.3	0.9	7.4	2.9	0.2	0.0	0.0	0.0	0.0	2.1
Goldeneyes	0.0	1.3	0.0	0.0	0.6	0.0	0.0	8.8	2.4	0.0
Bufflehead	1.3	1.3	0.4	2.1	1.4	0.4	0.0	1.7	0.6	1.7
Ruddy Duck	0.0	2.7	1.7	1.5	22.3	0.6	1.3	5.7	3.1	1.8
Subtotal	38.1	55.7	66.4	38.3	82.7	39.9	25.0	62.4	67.4	43.8
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	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	1.4	0.0	7.7	0.7	0.0	0.0	0.0	0.7	0.8	3.5
Subtotal	1.4	0.0	7.8	0.7	0.0	0.0	0.0	0.7	0.8	3.5
Total Ducks	1100.7	1216.4	1047.3	623.9	978.6	880.8	694.6	933.1	715.5	666.6
Canada Goose	19.0	0.0	44.9	42.2	42.2	50.4	61.2	31.6	14.0	22.1
Am. coot	13.9	19.4	23.4	58.1	31.0	22.3	9.6	17.5	38.0	22.2
Ponds										209.2
Species/Ponds	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Ducks										
Dabblers										
Mallard	478.4	168.0	171.0	282.5	258.3	256.2	245.8	323.5	230.1	189.8
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	72.9	55.3	19.7	174.8	78.6	83.5	119.9	95.1	71.0	38.3
Am. wigeon	110.6	99.7	77.1	157.0	87.9	148.9	65.2	89.4	77.9	73.0
Am. green-winged teal	53.1	13.6	3.9	18.2	40.1	9.9	9.1	13.4	18.9	10.6
Blue-winged teal	98.3	207.1	93.8	93.9	117.5	103.4	81.8	211.0	79.9	52.1
N. shoveler	100.2	102.2	31.1	179.2	189.6	52.2	121.8	160.7	61.8	65.0
N. pintail	259.2	226.0	118.5	348.9	324.8	146.6	157.3	306.9	88.3	99.8
Subtotal	1172.8	871.9	514.9	1254.7	1096.7	800.7	801.0	1200.0	627.9	528.6
Divers										
Redhead	0.7	2.7	3.2	7.0	14.7	4.4	25.0	15.0	10.5	19.2
Canvasback	2.1	16.2	3.2	6.4	10.4	4.8	5.4	12.5	5.0	3.5
Scaups	26.4	29.9	34.4	72.1	88.6	36.8	35.8	61.0	47.1	53.3
Ring-necked duck	0.0	1.4	0.2	0.8	0.0	0.9	0.9	2.4	16.3	3.0
Goldeneyes	0.0	0.0	0.6	0.0	1.1	1.6	0.0	0.0	0.0	0.6
Bufflehead	0.4	0.6	0.0	1.3	3.6	1.0	2.4	5.6	0.4	1.8
Ruddy Duck	2.6	1.9	1.2	14.1	12.4	0.7	17.1	17.8	9.1	11.8
Subtotal	32.2	52.7	42.8	101.7	130.8	50.1	86.6	114.2	88.3	93.1
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Mergansers	1.4	0.8	2.7	1.9	4.1	0.0	8.5	1.8	0.0	1.4
Subtotal	1.4	0.8	2.7	1.9	4.1	0.0	8.5	1.8	0.2	1.4
Total Ducks	1206.4	925.4	560.3	1358.3	1231.5	850.8	896.0	1316.0	716.5	623.1
Canada Goose	23.1	27.0	26.3	27.9	41.6	36.6	31.3	37.1	34.6	51.1
Am. coot	13.8	59.5	16.4	83.1	319.4	104.2	197.7	53.3	42.9	103.5
Ponds	279.4	235.5	158.6	301.9	241.2	152.3	176.3	273.5	173.9	206.2

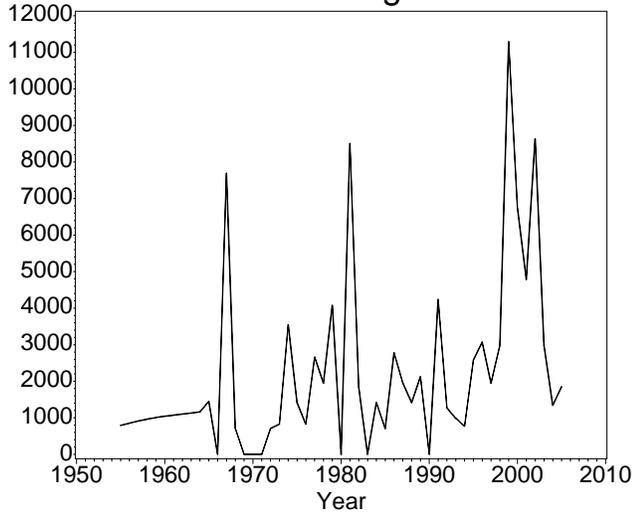
Appendix 1 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands).

Species/Ponds	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Ducks										
Dabblers										
Mallard	152.0	156.9	240.9	218.0	282.8	148.4	222.7	239.9	288.6	368.7
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	40.8	33.8	32.6	30.7	128.5	56.7	96.9	154.4	181.5	182.9
Am. wigeon	58.7	52.0	64.9	44.0	58.8	126.2	70.3	88.2	65.5	137.7
Am. green-winged teal	6.4	6.2	6.0	12.0	17.0	15.7	12.4	16.3	8.4	34.0
Blue-winged teal	38.6	21.6	40.2	83.5	65.9	76.3	77.7	89.0	60.3	186.4
N. shoveler	34.1	69.3	73.2	33.7	58.6	86.3	51.5	27.1	92.7	194.3
N. pintail	56.5	95.9	146.0	61.6	58.0	131.2	43.1	75.5	130.4	244.5
Subtotal	387.0	435.6	603.8	483.6	669.6	640.6	574.7	690.4	827.4	1348.5
Divers										
Redhead	2.7	3.6	3.4	2.7	7.0	7.8	6.4	5.5	5.3	3.4
Canvasback	2.1	2.8	1.0	2.1	5.1	10.8	1.0	5.6	9.3	12.5
Scaups	20.0	33.4	44.7	55.9	46.9	33.1	25.2	14.0	28.3	28.6
Ring-necked duck	4.3	7.1	0.4	1.2	3.8	0.4	0.5	3.9	4.0	5.0
Goldeneyes	1.3	2.5	0.0	0.0	1.1	0.6	0.7	0.0	1.5	0.0
Bufflehead	1.0	0.4	0.0	4.1	1.7	6.0	2.2	1.3	0.4	0.3
Ruddy Duck	8.0	4.6	0.6	25.1	5.8	9.2	38.0	9.2	1.8	4.7
Subtotal	39.3	54.5	50.2	91.2	71.4	67.9	73.9	39.6	50.6	54.5
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	0.7	2.8	1.9	1.4	2.1	0.0	4.2	1.3	1.0	0.8
Subtotal	0.7	2.8	1.9	1.4	2.1	0.0	4.2	1.3	1.0	0.8
Total Ducks	427.1	492.9	656.0	576.2	743.1	708.6	652.8	731.3	879.0	1403.7
Canada Goose	49.4	32.9	39.4	67.1	79.3	97.7	70.8	90.5	103.3	76.3
Am. coot	145.2	32.1	27.2	95.5	65.9	153.4	52.9	15.3	58.3	56.8
Ponds	287.3	396.7	229.3	170.3	337.8	246.0	241.6	235.5	194.8	478.5
Species/Ponds	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Ducks										
Dabblers										
Mallard	366.0	386.9	641.2	549.5	319.0	304.1	239.1	185.8	279.7	262.8
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
Gadwall	359.3	201.7	513.5	232.7	205.3	125.9	179.0	87.3	109.1	101.3
Am. wigeon	116.9	100.2	122.4	92.9	63.1	57.6	41.6	28.6	30.7	42.8
Am. green-winged teal	30.3	56.1	58.1	13.3	27.2	16.5	18.1	40.6	50.2	56.4
Blue-winged teal	94.4	89.3	138.1	225.5	241.5	50.0	72.8	73.3	171.2	145.9
N. shoveler	81.4	109.3	209.1	90.5	235.6	60.3	86.1	76.2	158.5	125.6
N. pintail	154.5	135.6	209.3	110.9	131.8	58.7	79.0	47	95.0	77.9
Subtotal	1202.8	1079.1	1891.7	1315.4	1223.5	673.1	715.7	538.7	894.3	812.7
Divers										
Redhead	3.4	8.1	4.3	6.1	6.3	1.8	4.8	9.5	8.4	11.2
Canvasback	8.0	4.6	9.6	6.1	4.9	3.5	4.5	1.2	10.6	10.4
Scaups	21.4	35.9	32.7	14.1	28.0	30.7	31.5	20.6	24.6	16.3
Ring-necked duck	7.0	0.4	0.0	2.1	2.4	0.0	2.9	1.1	0.3	3.0
Goldeneyes	0.4	0.0	0.9	0.7	1.4	0.5	0.0	1.6	0.0	0.5
Bufflehead	0.5	0.0	2.2	1.5	1.1	1.7	0.6	0.5	0.6	0.6
Ruddy Duck	7.0	1.2	8.9	11.8	8.3	2.4	24.9	14.9	12.5	10.2
Subtotal	47.7	50.1	58.6	42.4	52.5	40.6	69.3	49.5	57.0	52.2
Miscellaneous										
Long-tailed duck	0.0	0.0	0.0	0.0	0.5	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
Scoters	0.0	0.3	0.5	0.0	0.0	0.0	0.0	0	0.5	0.0
Mergansers	2.6	3.1	1.9	3.0	11.3	6.7	4.8	8.6	4.7	1.3
Subtotal	2.6	3.4	2.4	3.0	11.8	6.7	4.8	8.6	5.2	1.3
Total Ducks	1253.1	1132.6	1952.7	1360.8	1287.9	720.4	789.8	596.8	956.5	866.3
Canada Goose	98.6	106.6	78.5	84.9	84.2	94.9	88.2	82.8	56.9	70.9
Am. coot	33.2	38.8	80.1	12.8	174.7	69.1	21.6	36.3	27.4	43.4
Ponds	348.8	384.1	314.5	325.4	377.3	162.6	154.0	164.7	260.8	297.3

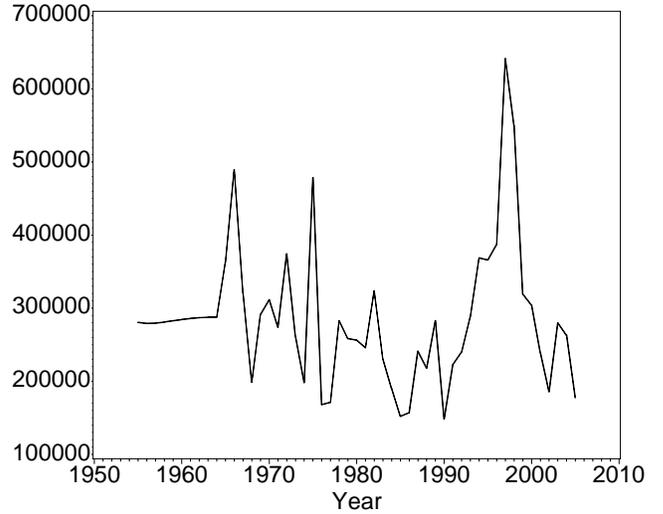
Appendix 1 (continued). Long-term trend in adjusted waterfowl breeding population estimates (thousands).

Species/Ponds	2005
Ducks	
Dabblers	
Mallard	177.5
Am. black duck	0.0
Gadwall	94.3
Am. wigeon	43.6
Am. green-winged teal	34.5
Blue-winged teal	144.1
N. shoveler	82.7
N. pintail	45.6
Subtotal	622.4
Divers	
Redhead	1.2
Canvasback	3.4
Scaups	12.8
Ring-necked duck	1.8
Goldeneyes	0.0
Bufflehead	3.0
Ruddy Duck	0.3
Subtotal	22.6
Miscellaneous	
Long-tailed duck	0.0
Eiders	0.0
Scoters	0.0
Mergansers	1.9
Subtotal	1.9
Total Ducks	646.8
Canada Goose	73.9
Am. coot	5.1
Ponds	373.0

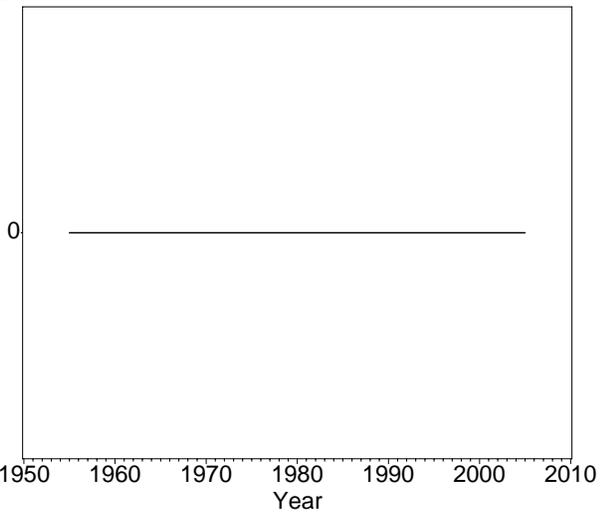
Strata 41-42 Mergansers



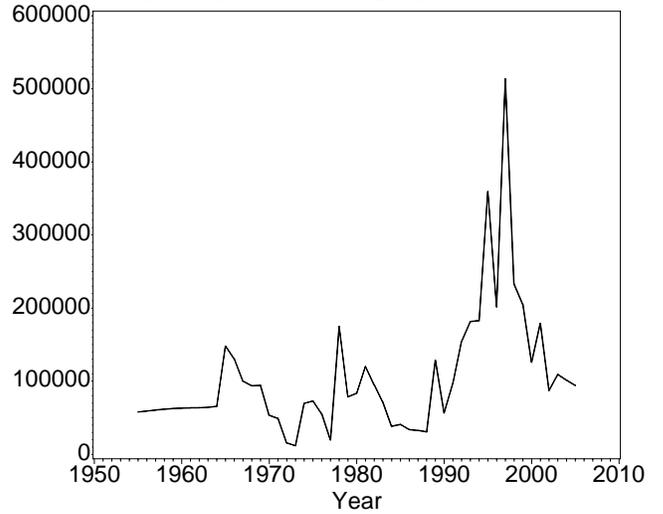
Strata 41-42 Mallard



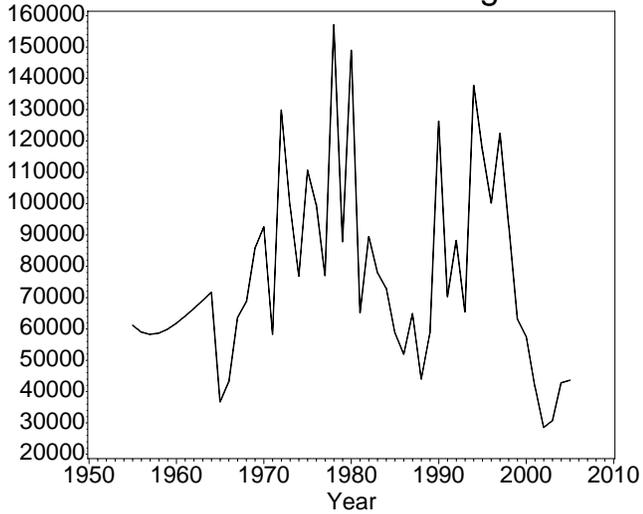
Strata 41-42 American black duck



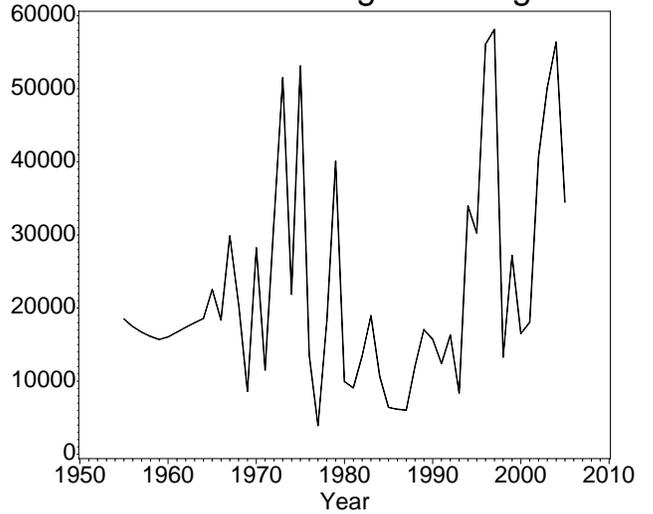
Strata 41-42 Gadwall



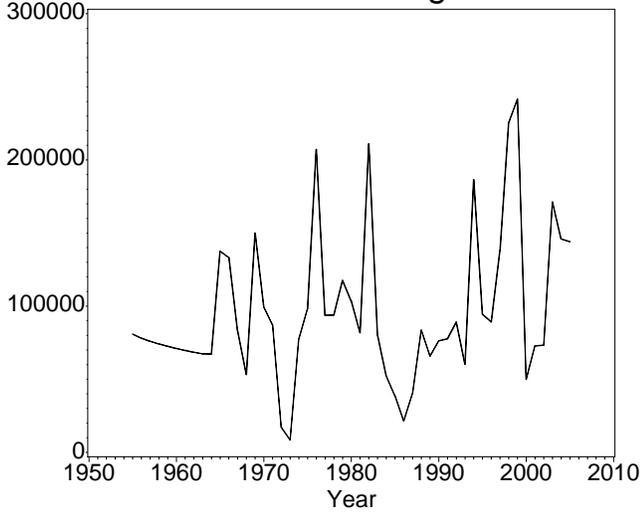
Strata 41-42 American wigeon



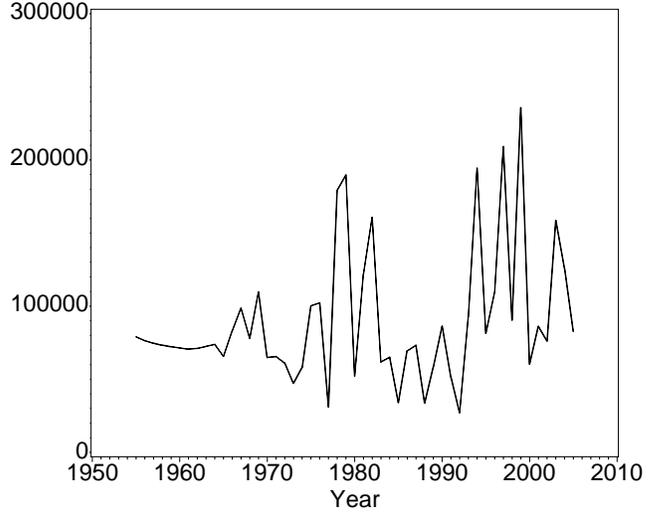
Strata 41-42 American green-winged teal



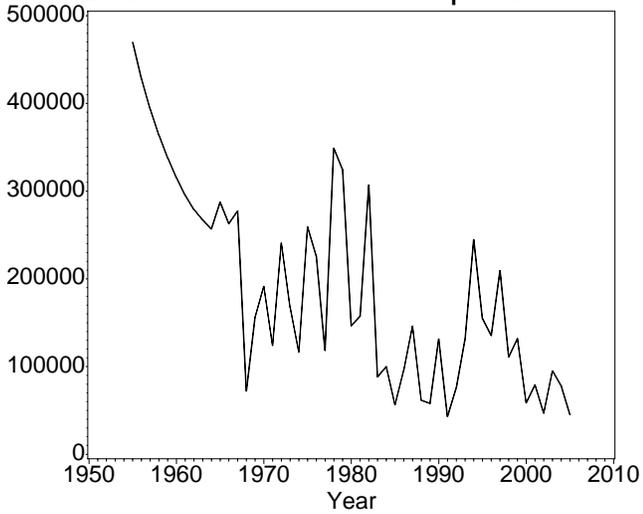
Strata 41-42 Blue-winged teal



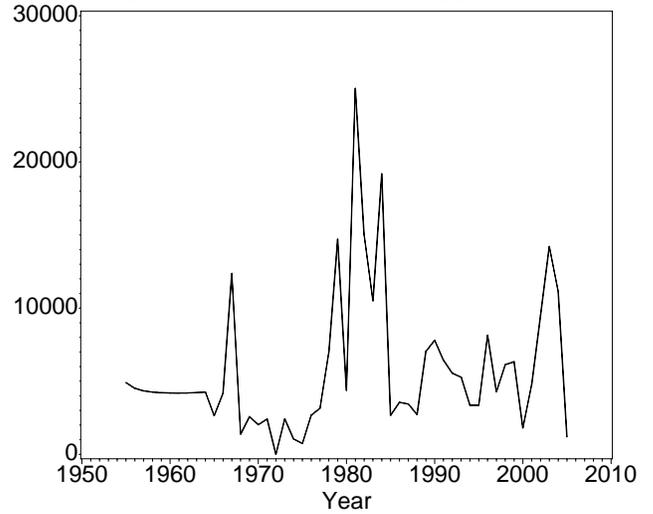
Strata 41-42 Northern shoveler



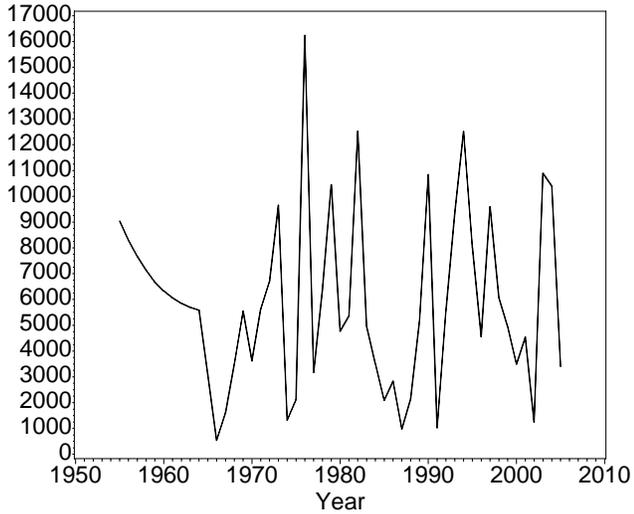
Strata 41-42 Northern pintail



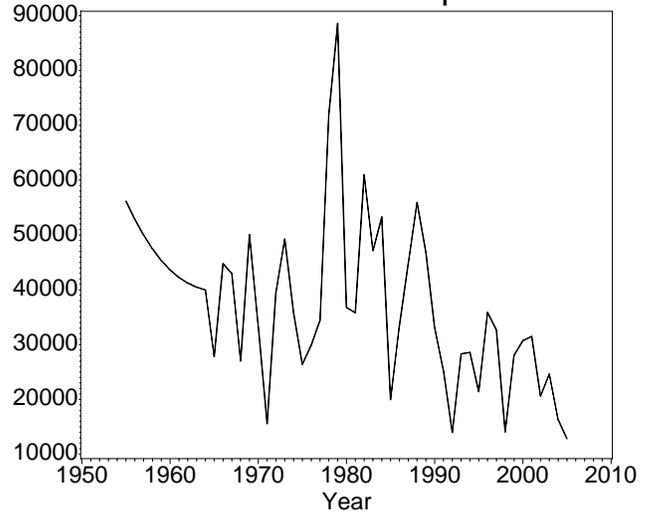
Strata 41-42 Redhead



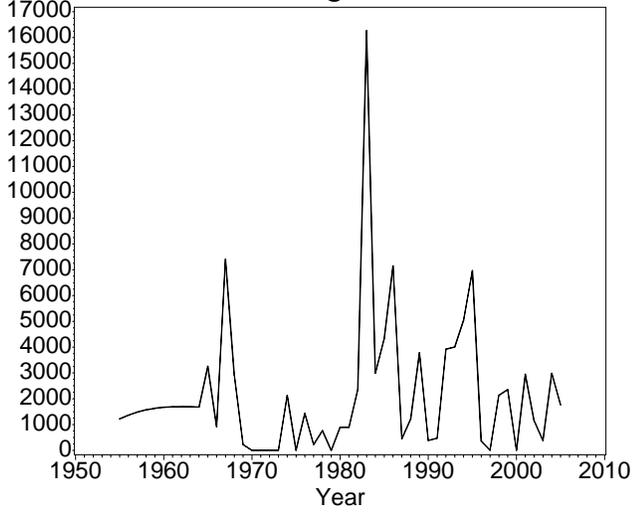
Strata 41-42 Canvasback



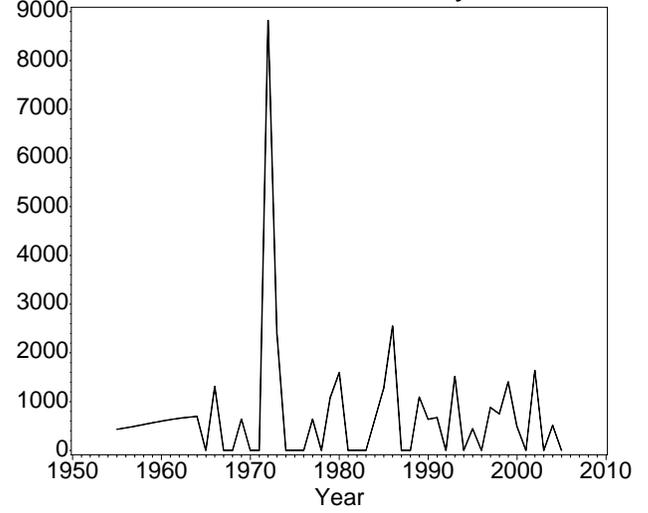
Strata 41-42 Scaups



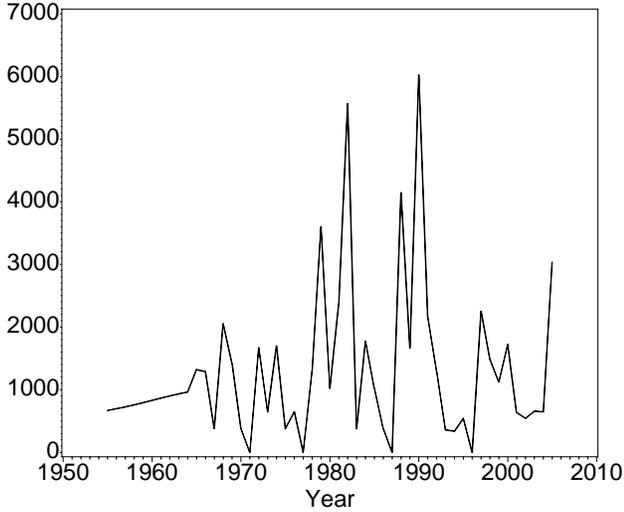
Strata 41-42 Ring-necked duck



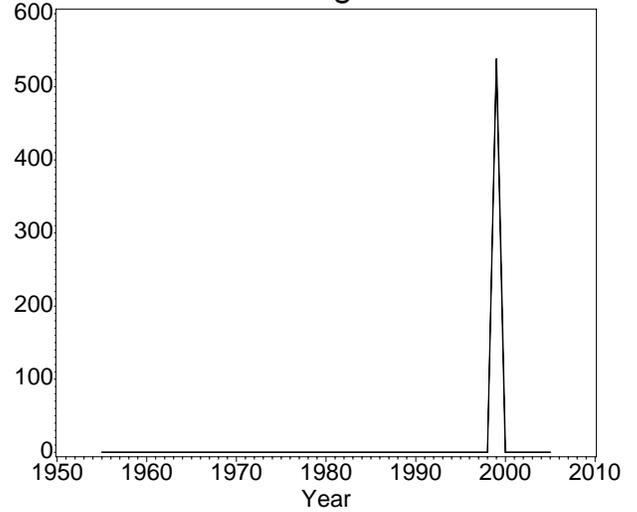
Strata 41-42 Goldeneyes



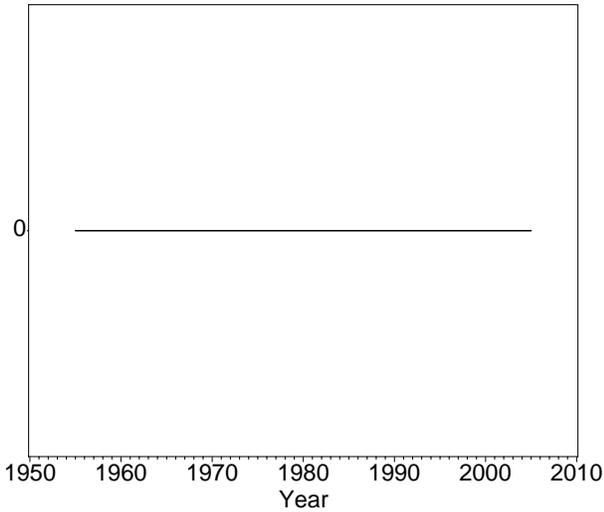
Strata 41-42 Bufflehead



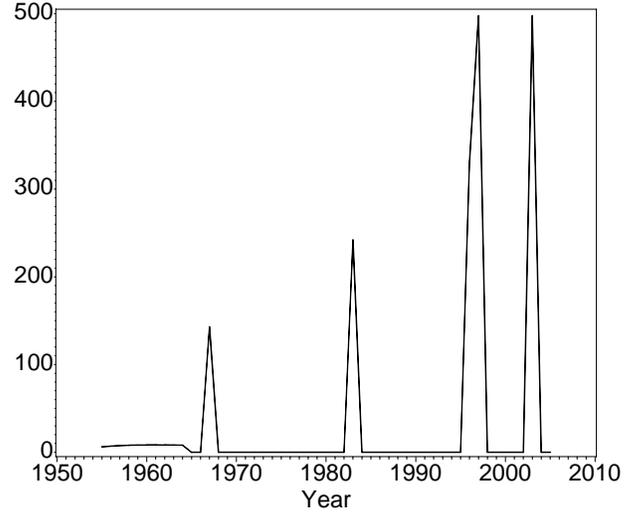
Strata 41-42 Long-tailed duck



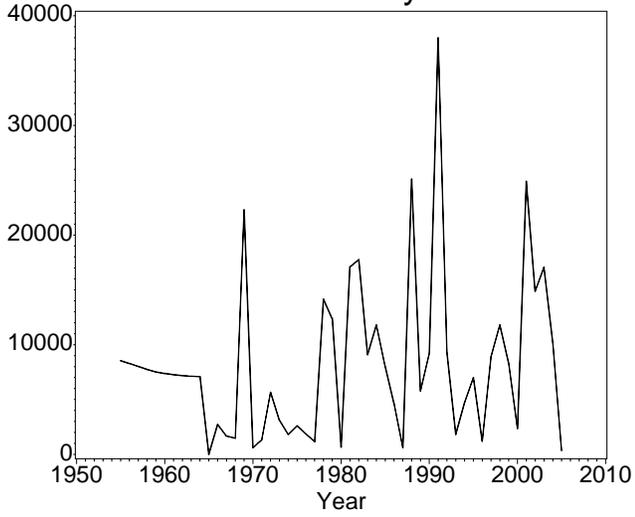
Strata 41-42 Eiders



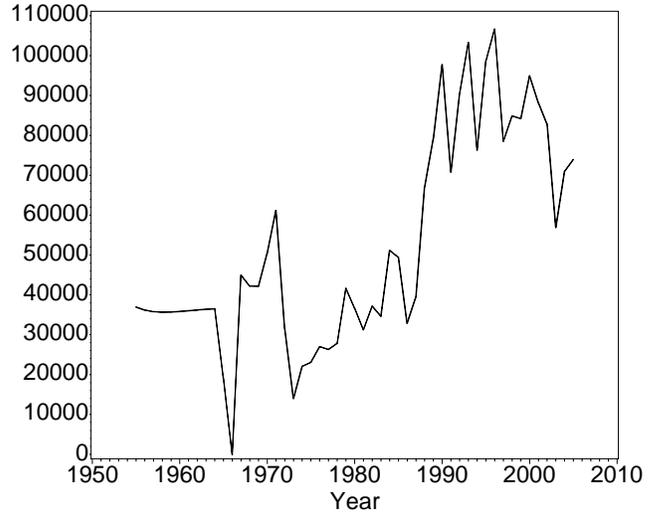
Strata 41-42 Scoters



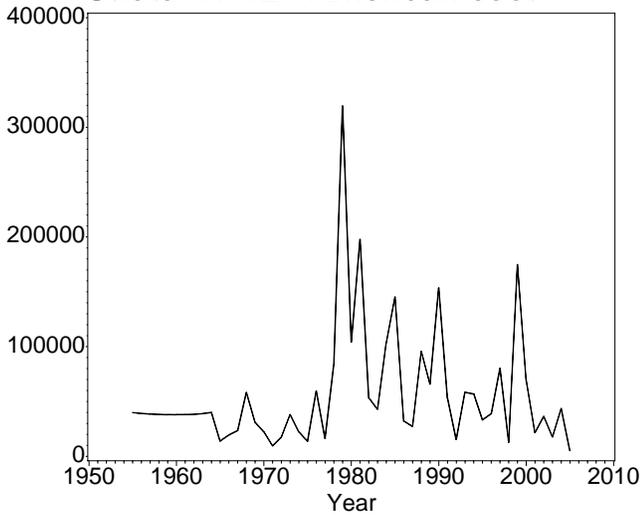
Strata 41-42 Ruddy Duck



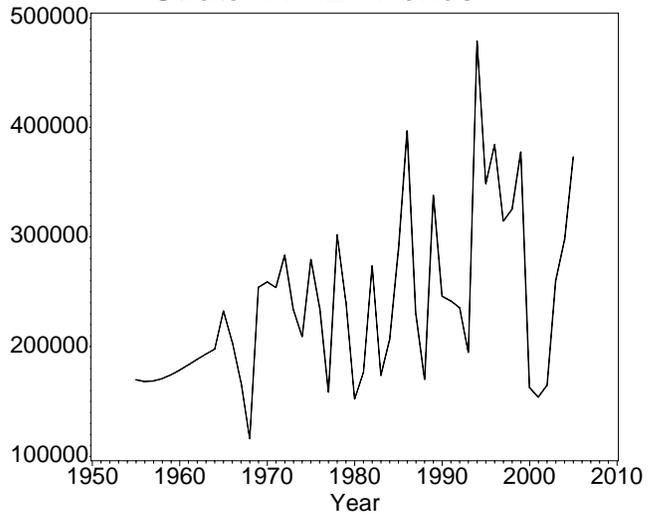
Strata 41-42 Canada Goose



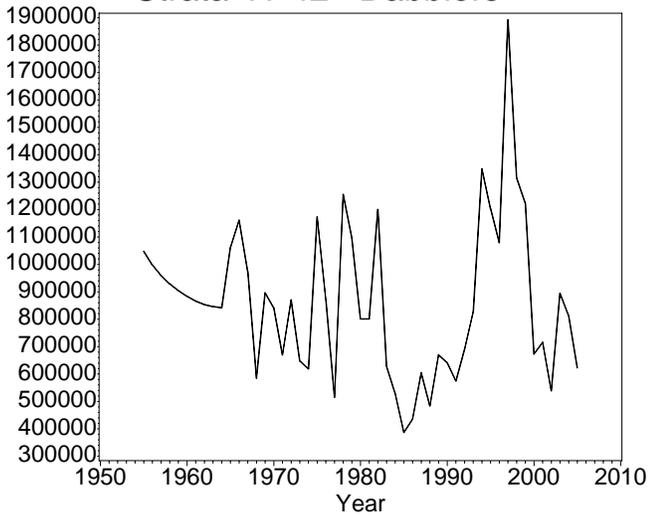
Strata 41-42 American coot



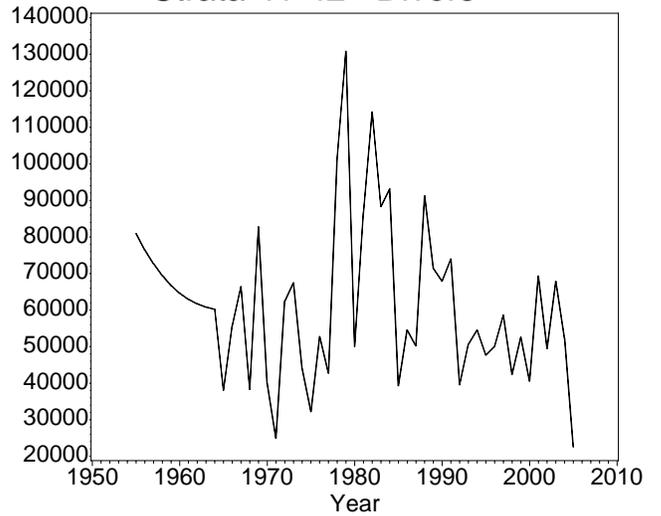
Strata 41-42 Ponds



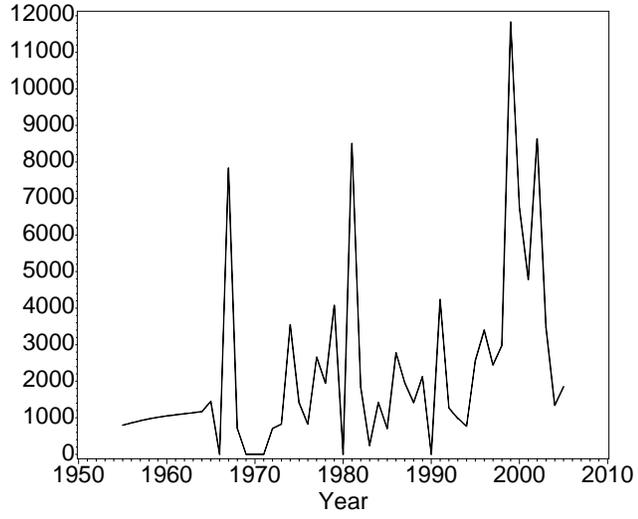
Strata 41-42 Dabblers



Strata 41-42 Divers



Strata 41-42 Miscellaneous



Strata 41-42 Total Ducks

