

**61st Annual
North Dakota
Breeding Duck Survey
May 2008**



PRELIMINARY PROGRESS REPORT
W-67-R-48-D-I-4

2008 Waterfowl Breeding Ground Survey in North Dakota
with Comparable Data for 1948-2007

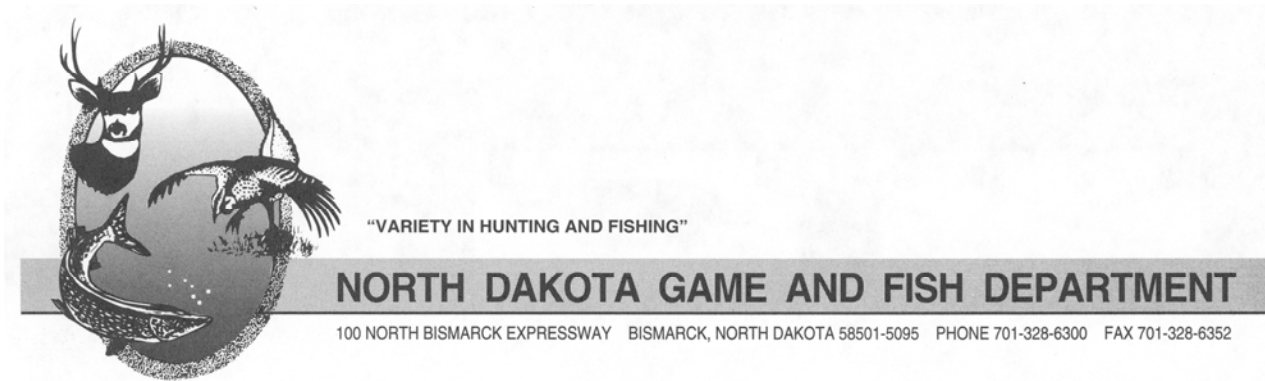
by
M. Johnson

Survey Dates: May 12-15, 2008
1816 Transect Miles on 8 Transects

RESULTS

	2008 Index	2007 Index	1948-2007 Ave. Index	Percent change of the 2008 index from:	
				2007 Index	1948-2007 Average Index
Water areas	251,686	837,708	590,329	-70.0%	-57.4%
Coots	274,100	159,074	405,378	-2.2%	-61.2%
Ducks	3,427,880	3,219,309	2,144,191	+6.5%	+59.9%

Year	<u>Units Per Square Mile</u>		
	<u>Water Areas</u>	<u>Coots</u>	<u>Ducks</u>
1983	10.96	8.64	33.57
1984	10.48	7.31	31.39
1985	8.32	2.69	18.37
1986	17.42	4.10	25.78
1987	6.01	4.39	22.98
1988	3.42	4.50	25.94
1989	4.73	2.10	18.03
1990	2.00	1.72	15.46
1991	5.58	0.22	10.87
1992	3.50	1.93	19.20
1993	7.31	1.23	16.54
1994	7.98	7.15	33.93
1995	18.72	21.83	53.85
1996	14.28	19.22	59.35
1997	14.87	21.64	68.65
1998	10.24	12.05	52.68
1999	23.84	13.95	59.44
2000	7.39	7.76	53.42
2001	12.16	6.03	60.83
2002	9.09	7.87	76.74
2003	12.86	2.96	55.89
2004	10.77	6.97	60.96
2005	9.93	1.93	58.52
2006	8.53	2.30	52.19
2007	11.85	2.25	45.56
2008	3.56	3.88	48.51



MEMO

TO: Duck Counters – R. Johnson, J. Kobriger, S. Kohn, K. Luttschwager, B. Prince, A. Robinson, J. Smith and all other interested waterfowlers.

FROM: M. Johnson, M. Szymanski and K. Skildum

SUBJECT: Results of 2008 May Breeding Duck Survey

Date: 6 June 2008

Thanks for all your help with our **61st Annual May Breeding Duck Survey**. Your efforts are greatly appreciated. Attached are summary tables and charts of the results.

The survey was completed during May 12-15, 2008. Weather conditions were generally good for conducting the survey and were, perhaps, some of the nicest weather conditions we have had during this survey in several years.

We continue to work on GPS-linked computer data entry technology for use in the field. This year, tablet computers with a "touch-screen" were used to record all data on Transects 1, 2, 3 and 5. We successfully used the system on routes 3 and 5 last year. All data entered through this system – duck observations, wetland data and miscellaneous wildlife observations - are geo-referenced. That is, each data entry is associated with a specific latitude/longitude through a GPS unit that is linked to the tablet. As a backup, we recorded the entire survey for each of these routes on a digital voice recorder. The computer tablet data files and the digital voice recordings were backed-up onto a laptop computer every night during the survey. This data entry system is being developed by Brian Hosek and Szymanski. Szymanski has been using the tablet data system on the weekly Test Run Surveys for the past three years. Overall, the system worked very well, with only minimal glitches. Szymanski has produced computer code that generated the needed data summary tables. Thus, now that the programming code is complete, the field data for each route that is entered into the computer tablet can be summarized in minutes rather than a day or more. In the past, summarizing all the duck/wetland data has taken a week or more to complete. We plan expand the system to the remaining routes in the next year or two. This type of system also has great potential for data entry for other surveys, such as roadside brood counts, pheasant crowing counts, etc.

Weather and migration history:

December 2007 and January 2008 had above to near normal temperatures in North Dakota. Precipitation was below normal, especially in the western half of the state where moderate to severe drought conditions continued. On February 3, average snow cover across the state was 3.3 inches, with 7 inches in the northeast and less than an inch in the southwest. February had below normal temperatures, but near normal precipitation due to two major storm systems. March started cold with temperatures in the negative teens and twenties and ended with temperatures in the 40's to 60's. These high temperatures melted most of the snow in the western two-thirds of the state.

Warming temperatures in mid-March brought migrating waterfowl back to North Dakota. Migrant Canada geese and snow geese were seen in southeastern and central North Dakota on 13-14 March. Mallards, northern pintail, gadwall, wigeon, lesser scaup, and ring-necked ducks were observed on March 14 at Tewaukon NWR. Redheads were seen in the Bismarck-Mandan area on March 15. A green-winged teal was also spotted in the Bismarck-Mandan Area on March 17. By March 28, wood ducks, northern shoveler, canvasback, and ruddy ducks had also been observed at Tewaukon NWR. Long Lake NWR reported blue-winged teal on March 29. A major movement of snow geese occurred during the last week of March and first week of April. By April 14 the majority of snow geese had moved into Canada.

April was cool with below normal temperatures. Scattered showers brought some precipitation but did little to improve dry conditions. On 25 April a late snow storm dropped up to 9 inches of snow on the eastern edge of the state. The week of the breeding ground survey (May 12-16) had good weather with normal to above average temperatures with light scattered showers.

Phenology:

The starting date of the 2008 survey, May 12, was about 1 day earlier than the long-term average starting date (Appendix A), and was 5 days later than last year. The timing of our survey appeared to be appropriate based on vegetation phenology. Crews noted wetland vegetation green-up was minimal with relatively few areas having new vegetation up to 12 inches high. These growing vegetation conditions were not extensive and did not cause major problems with the survey across the state.

Lone drake ratios for mallards, pintails, canvasbacks and blue-winged teal were all low and well below average. This is likely an indication that nesting effort was lower due to extreme declines in numbers of water areas, and a nearly complete absence of temporary wetlands. This reduction in nesting effort may also be delaying nesting chronology overall, as pairs "wait it out" for better wetland conditions. Observations on our Test Run Survey indicated that nesting activity likely began during the last week of April. The breeding effort appears to be quite low given the abundance of pairs of mallards and pintails and the few lone drakes of either species. This is likely the result of extremely dry conditions on the Test Run route. Most mallard, pintail, and blue-winged teal pairs that had been in the area for several weeks had moved on by 21 May. A few newly hatched pintail broods and one mallard brood had been observed 28 May. The correction factor for absent females (for all duck species combined) was 1.16, well below the long-term average of 1.24 and was the third lowest on record.

Results of the survey in brief:

The 2008 water index was down 70 percent from 2007 and down 57 percent from the 1948-2007 average (Table 1). Water indices were down from 2007 on all transects, ranging from down 40 percent on transect 5 to down 81 percent on transect 3. The wetland index is the 10th lowest in survey history and it is the lowest index since 1992. However, these significant decreases in the wetlands indices do not tell the whole story. **Wetland conditions are generally much worse than indicated by the numbers.** This is because the survey counts water areas, not the amount of water contained in wetlands. Thus, wetlands with even a trace of water contribute as much to the index as those that are full. Many seasonal and semi-permanent wetlands contained only minimal water and are expected to dry up completely within a few weeks without significant rainfall.

Numbers of breeding ducks in North Dakota were unchanged from last year and continue their decline from the record high in 2002. However, numbers remain relatively high compared to the 60-year average. **The 2008 duck index was unchanged (up 6.5 percent) from 2007, but exceeded the 1948-2007 average index by 60 percent (Table 3). The 2008 index is the thirteenth highest on record.** Compared to 2007, total ducks observed on individual transects ranged from down 47 percent (transect 8) to up 49 percent (transect 5; Table 5). Figure 2 demonstrates the remarkable high numbers of ducks settling in North Dakota since 1995, compared to breeding population indices going back to 1948.

Changes from 2007 in the indices for individual species were highly variable (Table 4). Mallards were down 29 percent from 2007, while blue-winged teal were unchanged (down 4 percent). Pintail were down 36 percent, while wigeon and green-winged teal were down 27 and 14 percent, respectively. Gadwall (+47 percent) and northern shovelers (+20 percent) showed significant increases. All diving ducks showed increases from last year (canvasback +37 percent, redhead +88 percent, scaup + 46 percent and ruddy ducks + 12 percent).

Species that were above the long-term (1948-2007) average include scaup (+238 percent), gadwall (+187 percent), redhead (+153 percent), northern shovelers (+67 percent), ruddy ducks (+73 percent) and mallard (+59 percent). Blue-winged teal, wigeon and canvasback were unchanged from the long-term average. Northern pintail (-43 percent) and green-winged teal (-14 percent) were below the long-term average.

An Important Note:

Like the wetland indices, the breeding duck indices, by themselves, do not tell the whole story. As noted above (see Phenology), the lone drake indices were well below average and the correction for females (hens presumably on nests) was the third lowest on record. Both of these are consistent with our observations that there were a lot of ducks “sitting around” apparently not in an active breeding mode. **The large number of ducks tallied during our survey is “abnormal” considering the extremely poor water conditions across the state.** Part of this is due to the fact that we have been carrying a duck population that is well above average since the mid-1990’s. This year, many of these birds continued to ‘home’ to North Dakota, despite the greatly reduced water conditions. With the extremely dry conditions, we expect many ducks were either waiting for improved water conditions before committing to a nesting effort, or they were still in the process of settling. Gadwall and scaup typically do not breed until June and we normally count a substantial number of these birds during our mid-May survey that we know have not fully settled. This year, however, there seemed to be an exceptional abundance of these

unsettled birds. Gadwall, were the most abundant duck tallied and scaup were the fourth most abundant duck tallied during our survey. This year was only the sixth time since 1948 that gadwall have out-numbered mallards on our survey and it is the third highest percentage of scaup we have ever observed. Observations on our Test Run Survey confirmed this situation, as we detected a major movement of birds out of the survey area the week after our statewide survey was completed. **Thus, we believe that our 2008 breeding duck index is abnormally inflated compared to previous years.**

Overview:

The unprecedented modern day wet cycle that began in the summer of 1993, seems to have come to an end. Pond conditions are very poor throughout the state. We again caution that the index is based on basins with water, and does not necessarily represent total water availability. Our survey crews indicated that many “wet basins” held very little water at the time of the survey and that a high percent of the ponds that had small amounts of water would soon be totally dry without the addition of significant precipitation.

This year ducks appeared to be ‘bunched-up’ on the remaining water area. Many birds appeared to be not breeding and a large portion of the gadwall and scaup observed had not settled at the time of our survey. Again, we observed that many of the larger wetlands are holding fewer birds in both spring and fall, presumably due to reduced fertility and productivity of wetlands from years of continuous high water levels. Many of these areas need to dry to recycle nutrients and to regain invertebrate and aquatic vegetation productivity. Reports indicate that much of South Dakota is experiencing significantly improved water conditions due, primarily, to late winter/early spring precipitation. Also, reports from Canada indicate that while the southern portion of the prairie pothole region is dry like North Dakota, while the parklands continue to experience good to excellent water conditions this year.

Nesting cover in North Dakota is on the decline. During our survey, we noted many large tracts of grassland/ CRP that had been converted to cropland since last year or where in the process of being plowed. Expiring CRP contracts and high commodity prices driven by biofuel demands and other economic factors are pushing these conversions. North Dakota lost 400,000 acres of CRP in 2007 and projections for the next three years indicate that up to another 600,000 acres could be converted to cropland. This loss of one third of our critical nesting cover will be disastrous for breeding ducks and hunting opportunities in North Dakota. On the bright side, the significant wetland drying that we are experiencing is long overdue. When these wetlands refill they will once again become highly productive sources of food and cover for breeding waterfowl.

Growing conditions this spring have been mixed across the state this spring. Some areas have had significant rainfall, while others remain very dry. Numbers of red fox may be stable at their recent lows due to mange and coyote population expansion (Appendix H). Only one red fox den was reported on the survey routes. How this will all translate into duck production this year is yet to be seen.

As usual, we are still waiting to see what brood water conditions will be throughout the state. At this time, conditions do not look good. Water levels in most semi-permanent and many permanent wetlands are much lower than in recent years and dropping. Numbers of mink, a significant brood predator, are unknown, but probably on the decline. Muskrat numbers remain low and this will certainly affect mink abundance. We noted very few muskrats, a principal food of mink, during our surveys. This scarcity of muskrats is probably related to the absence of

cattail and bulrush habitats in many wetlands that has resulted from the preceding 15 years of high water conditions.

The July brood survey will give us a better idea of duck production, and a better insight into what to expect this fall. Our observations to date indicate that production will be reduced in much of the state due to dry conditions and reduced wetland availability for brood production. Despite the relatively large populations of ducks tallied on our survey, it is expected that breeding efforts will be reduced and that production will be significantly reduced from recent years. As always, fall weather will have a big impact on the success of our hunting season. We will have to wait and see what October brings.

Have a great summer and fall and thanks again for all your help with our 61st Annual Survey.

cc: Steinwand
Rostvet
Schadewald
Kreil
Link
Bihrlé
Headrick
McKenna
Power
Timian
G. Freeman
Wilson
Peterson
67R Staff

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**Table 1. Water indices, May breeding duck survey,
North Dakota, 1948-2008.**

Year	Water Index*	Pct. Change from previous Year	Running Average	Pct. Change of Annual Index from previous Running Avg.
1948	282,660		282,660	
1949	360,392	27.5	321,526	27.5
1950	650,118	80.4	431,057	102.2
1951	525,857	-19.1	454,757	22.0
1952	279,142	-46.9	419,634	-38.6
1953	429,643	53.9	421,302	2.4
1954	239,874	-44.2	395,384	-43.1
1955	343,432	43.2	388,890	-13.1
1956	445,189	29.6	395,145	14.5
1957	276,300	-37.9	383,261	-30.1
1958	321,526	16.4	377,648	-16.1
1959	146,277	-54.5	358,368	-61.3
1960	383,711	162.3	360,317	7.1
1961	168,268	-56.1	346,599	-53.3
1962	336,406	99.9	345,920	-2.9
1963	358,600	6.6	346,712	3.7
1964	320,746	-10.6	345,185	-7.5
1965	772,802	140.9	368,941	123.9
1966	1,028,846	33.1	403,673	178.9
1967	790,235	-23.2	423,001	95.8
1968	632,406	-20.0	432,973	49.5
1969	678,945	7.4	444,153	56.8
1970	1,029,780	51.7	469,615	131.9
1971	471,620	-54.2	469,699	0.4
1972	872,730	85.0	485,820	85.8
1973	257,445	-70.5	477,037	-47.0
1974	943,395	266.4	494,309	97.8
1975	791,790	-16.1	504,933	60.2
1976	484,225	-38.8	504,219	-4.1
1977	181,020	-62.6	493,446	-64.1
1978	654,664	261.7	498,647	32.7
1979	847,360	29.4	509,544	69.9
1980	224,760	-73.5	500,914	-55.9
1981	226,470	0.8	492,842	-54.8
1982	827,120	265.2	502,393	67.8
1983	774,670	-6.3	509,956	54.2
1984	740,740	-4.4	516,194	45.3
1985	587,890	-20.6	518,080	13.9
1986	1,231,190	109.4	536,365	137.6
1987	424,165	-65.5	533,560	-20.9
1988	241,413	-43.1	526,435	-54.8
1989	344,647	42.8	522,106	-34.5
1990	141,330	-59.0	513,251	-72.9
1991	394,417	179.1	510,550	-23.2
1992	247,328	-37.3	504,701	-51.6
1993	516,914	109.0	504,966	2.4
1994	564,231	9.2	506,227	11.7
1995	1,322,869	134.5	523,241	161.3
1996	1,009,390	-23.7	533,162	92.9
1997	1,050,949	4.1	543,518	97.1
1998	723,461	-31.2	547,046	33.1
1999	1,684,911	132.9	568,928	208.0
2000	521,894	-69.0	568,041	-8.3
2001	859,665	64.7	573,441	51.3
2002	642,056	-25.3	574,689	12.0
2003	908,996	41.6	580,659	58.2
2004	760,817	-16.3	583,819	31.0
2005	701,670	-7.8	585,851	20.2
2006	602,677	-14.1	586,136	2.9
2007	837,708	39.0	590,329	42.9
2008	251,686	-70.0	584,778	-57.4
Min	141,330	-73.5	345,185	-72.9
Max	1,684,911	266.4	590,329	208.0
Average	584,778			

*Water indices represent the number of water areas per square mile in the sample times the total square miles in the state (70,665).

- Denotes highest count

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M. Johnson 5/2008

Table 2. Water areas/mile², May breeding duck survey, North Dakota, 1959-2008.

YEAR	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Transect 7	Transect 8	Statewide
1959	1.91	2.38	2.64	1.59	2.42	1.71	2.82	1.11	2.70
1960	3.60	4.75	8.09	4.17	7.09	5.63	8.69	1.63	5.43
1961	2.04	1.87	2.90	1.54	3.06	2.56	3.68	1.69	2.38
1962	3.00	4.87	4.57	1.25	4.87	5.24	12.38	3.10	4.76
1963	3.33	4.87	7.91	3.43	5.33	6.44	6.91	2.71	5.07
1964	3.45	4.12	8.41	2.31	4.84	4.67	6.82	2.13	4.54
1965	8.61	11.45	10.84	7.08	8.49	18.77	21.46	3.07	10.94
1966	7.79	8.63	13.80	8.40	10.17	18.23	42.38	13.20	14.56
1967	7.07	6.62	10.48	8.02	8.95	16.44	27.42	8.30	11.18
1968	2.89	3.45	6.57	4.90	8.86	22.00	21.06	5.59	8.95
1969	5.00	5.75	10.54	9.03	9.11	16.17	17.40	6.04	9.61
1970	10.14	15.57	14.39	14.47	9.21	19.81	24.08	11.04	14.57
1971	4.36	5.98	8.48	5.38	6.98	8.08	11.77	3.22	6.67
1972	8.89	12.88	13.23	7.72	10.14	14.10	23.04	10.93	12.35
1973	3.55	5.52	5.75	2.57	3.62	2.88	3.23	1.61	3.64
1974	6.84	11.08	13.30	12.57	9.71	18.48	26.33	11.52	13.35
1975	8.18	11.46	12.80	10.55	9.98	14.65	15.52	7.37	11.20
1976	6.43	7.29	13.00	6.97	6.90	5.04	5.95	2.72	6.85
1977	3.04	2.83	4.45	1.65	1.84	2.96	2.06	1.70	2.56
1978	7.87	10.40	9.84	6.77	7.68	12.38	14.98	5.28	9.26
1979	8.71	11.94	13.20	9.85	11.81	10.67	23.48	7.85	11.99
1980	2.88	3.11	3.68	2.70	3.71	4.21	3.27	1.91	3.18
1981	2.55	2.38	3.12	2.32	4.25	6.23	3.06	1.92	3.20
1982	9.76	10.29	12.70	9.28	12.63	14.40	18.60	7.15	11.70
1983	10.77	11.08	11.71	9.93	13.17	10.71	11.79	8.32	10.96
1984	5.52	9.31	13.79	10.00	12.71	13.00	15.42	4.74	10.48
1985	3.00	8.77	10.73	9.53	7.60	6.13	11.50	9.56	8.32
1986	7.98	11.37	22.80	9.10	14.44	25.46	37.08	16.43	17.42
1987	2.93	3.89	7.32	4.33	9.16	7.44	11.50	2.31	6.01
1988	2.11	2.71	5.93	2.57	4.24	3.23	4.69	2.06	3.42
1989	3.66	3.65	7.71	2.58	4.51	4.48	9.19	3.02	4.73
1990	1.87	1.85	1.62	0.68	2.03	10.00	4.10	2.85	2.00
1991	2.59	1.78	5.82	3.50	4.63	9.40	14.83	4.52	5.58
1992	1.77	2.35	2.61	2.18	3.41	6.17	8.46	2.19	3.50
1993	2.23	2.28	4.25	2.02	7.49	9.71	27.98	6.83	7.31
1994	3.79	4.74	7.54	4.27	10.16	12.21	18.27	5.09	7.98
1995	6.89	10.38	23.55	11.73	9.48	25.40	38.92	15.41	18.72
1996	5.70	6.71	18.70	7.37	16.03	12.79	24.54	25.70	14.28
1997	6.25	7.09	14.88	12.57	16.59	26.71	27.02	11.54	14.87
1998	4.16	3.86	8.09	4.48	9.48	10.40	23.00	22.22	10.24
1999	9.43	11.03	30.00	19.35	23.95	24.04	44.77	33.91	23.84
2000	2.93	4.40	9.39	9.07	10.59	8.77	9.13	5.04	7.39
2001	4.91	4.58	10.25	10.37	11.87	27.83	19.17	11.83	12.16
2002	5.36	6.89	6.93	7.83	7.59	13.92	16.60	9.63	9.09
2003	7.30	10.66	11.38	10.27	9.32	23.48	18.58	14.54	12.86
2004	2.89	3.74	5.79	11.22	7.02	22.96	13.52	22.24	10.77
2005	4.36	6.68	6.23	4.90	8.35	27.00	17.56	7.67	9.93
2006	5.29	5.18	8.93	4.40	7.44	9.67	12.90	16.37	8.53
2007	5.00	4.14	12.84	3.47	7.90	23.73	26.23	16.94	11.85
2008	1.61	1.63	2.48	1.68	4.75	7.79	5.69	4.07	3.56
Average 1959-2007	5.11	6.50	9.87	6.58	8.38	12.78	16.59	8.24	8.93
Percent Change 2007 to 2008	-67.8%	-60.6%	-80.7%	-51.6%	-39.9%	-67.2%	-78.3%	-76.0%	-70.0%
Percent Change Mean to 2008	-68.5%	-74.9%	-74.9%	-74.5%	-43.3%	-39.1%	-65.7%	-50.6%	-60.1%
Min	1.61	1.63	1.62	0.68	1.84	1.71	2.06	1.11	2.00
Max	10.77	15.57	30.00	19.35	23.95	27.83	44.77	33.91	23.84

 - Denotes highest count

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M. Johnson 5/2008

Table 3. Breeding duck indices, May breeding duck survey, North Dakota, 1948-2007.

Year	Duck Index*	Pct. Change from previous Year	Running Average	Pct. Change of Annual Index from previous Running Average
1948	1,249,077		1,249,077	
1949	1,462,766	17.1	1,355,922	17.1
1950	1,949,454	33.3	1,553,766	43.8
1951	1,469,835	-24.6	1,532,783	-5.4
1952	1,221,109	-16.9	1,470,448	-20.3
1953	1,459,839	19.6	1,468,680	-0.7
1954	893,077	-38.8	1,386,451	-39.2
1955	1,199,185	34.3	1,363,043	-13.5
1956	1,271,685	6.0	1,352,892	-6.7
1957	923,456	-27.4	1,309,948	-31.7
1958	994,758	7.7	1,281,295	-24.1
1959	590,528	-40.6	1,223,731	-53.9
1960	902,711	52.9	1,199,037	-26.2
1961	993,264	10.0	1,184,339	-17.2
1962	890,237	-10.4	1,164,732	-24.8
1963	1,603,061	80.1	1,192,128	37.6
1964	1,096,758	-31.6	1,186,518	-8.0
1965	1,960,127	78.7	1,229,496	65.2
1966	2,689,476	37.2	1,306,337	118.7
1967	2,479,660	-7.8	1,365,003	89.8
1968	1,735,809	-30.0	1,382,661	27.2
1969	2,129,915	22.7	1,416,627	54.0
1970	2,968,245	39.4	1,484,088	109.5
1971	1,951,228	-34.3	1,503,553	31.5
1972	2,303,930	18.1	1,535,568	53.2
1973	1,256,410	-45.5	1,524,831	-18.2
1974	1,997,300	59.0	1,542,330	31.0
1975	1,922,280	-3.8	1,555,899	24.6
1976	1,559,770	-18.9	1,556,033	0.2
1977	890,475	-42.9	1,533,848	-42.8
1978	1,892,860	112.6	1,545,429	23.4
1979	2,614,295	38.1	1,578,831	69.2
1980	1,443,800	-44.8	1,574,739	-8.6
1981	1,530,500	6.0	1,573,438	-2.8
1982	2,374,900	55.2	1,596,337	50.9
1983	2,372,570	-0.1	1,617,899	48.6
1984	2,218,480	-6.5	1,634,131	37.1
1985	1,298,120	-41.5	1,625,288	-20.6
1986	1,821,420	40.3	1,630,317	12.1
1987	1,624,200	-10.8	1,630,164	-0.4
1988	1,826,860	12.5	1,634,962	12.1
1989	1,274,360	-30.2	1,626,376	-22.1
1990	1,092,205	-14.3	1,613,953	-32.8
1991	768,285	-29.7	1,594,734	-52.4
1992	1,356,640	76.6	1,589,443	-14.9
1993	1,164,265	-14.2	1,580,200	-26.8
1994	2,397,477	105.9	1,597,589	51.7
1995	3,805,643	58.7	1,643,590	138.2
1996	4,194,301	10.2	1,695,645	155.2
1997	4,851,144	15.7	1,758,755	186.1
1998	3,722,370	-23.3	1,797,257	111.6
1999	4,200,060	12.8	1,843,465	133.7
2000	3,774,979	-10.1	1,879,909	104.8
2001	4,298,742	13.9	1,924,702	128.7
2002	5,418,177	26.0	1,988,220	181.5
2003	3,949,619	-27.1	2,023,245	98.7
2004	4,307,458	9.1	2,063,319	112.9
2005	4,134,998	-4.0	2,099,037	100.4
2006	3,687,971	-10.8	2,125,968	75.7
2007	3,219,309	-12.7	2,144,191	51.4
2008	3,427,880	6.5	2,165,235	59.9
Min	590,528	-45.5	1,164,732	-53.9
Max	5,418,177	112.6	2,165,235	186.1
Average	2,165,235			

Breeding duck indices represent the number of ducks per square mile in the sample times the total square miles in the state (70,665).

5,418,177 - Denotes highest count

Table 4. Breeding duck species indices, May breeding duck survey, North Dakota, 1948-2008.

YEAR	MAL	GAD	WIG	GWT	BWT	SHV	PIN	TOTAL NON-MAL	RED	CAN	SCP	RUD	TOTAL DIVERS	OTHERS	TOTAL
1948	161,260	88,755	10,001	0	388,774	163,760	345,021	996,311	35,252	16,251	26,252	13,751	91,506	0	1,249,077
1949	207,713	81,915	27,793	0	334,973	174,069	506,117	1,124,867	45,346	23,404	35,106	23,404	127,260	2,926	1,462,766
1950	245,745	79,965	37,057	0	618,262	222,340	589,007	1,546,631	50,709	40,057	25,355	37,057	153,178	3,900	1,949,454
1951	213,126	61,733	27,927	0	438,010	144,044	424,781	1,096,495	38,219	54,384	45,565	19,108	157,276	2,938	1,469,835
1952	163,792	84,341	28,114	7,334	446,151	92,897	288,470	947,307	29,336	29,336	33,003	18,335	110,010	0	1,221,109
1953	202,739	120,093	31,888	3,218	555,851	114,973	268,564	1,094,587	40,372	31,303	77,234	13,604	162,513	0	1,459,839
1954	152,542	73,946	27,182	7,064	275,666	73,410	186,788	644,056	42,919	15,737	25,126	12,697	96,479	0	893,077
1955	159,252	71,951	31,179	0	361,314	98,573	192,829	755,846	48,447	38,374	167,766	19,667	274,254	9,833	1,199,185
1956	162,267	96,775	24,416	1,653	460,986	100,463	271,759	956,052	44,255	48,960	40,058	18,058	151,331	2,035	1,271,685
1957	178,689	78,678	16,530	6,372	248,871	50,328	249,795	650,574	28,627	37,400	23,918	2,401	92,346	1,847	923,456
1958	189,103	96,293	12,434	3,084	391,039	63,963	163,837	730,650	27,455	13,728	23,576	9,450	74,209	796	994,758
1959	96,256	91,886	11,751	5,256	187,492	59,998	75,824	432,207	21,968	20,137	16,417	2,598	61,120	945	590,528
1960	131,525	76,189	18,957	5,506	234,615	103,722	237,413	676,402	29,970	24,463	28,706	11,013	94,152	632	902,711
1961	129,522	150,678	28,705	10,926	303,244	112,239	155,247	761,039	34,764	21,157	36,353	8,045	100,319	2,384	993,264
1962	118,669	96,324	17,182	14,778	266,092	114,484	157,661	666,521	31,069	16,647	28,666	23,235	99,617	5,430	890,237
1963	219,780	177,298	32,222	15,389	604,033	155,818	211,444	1,196,204	64,924	21,481	82,558	14,588	183,551	3,526	1,603,061
1964	166,707	144,772	18,645	14,258	331,221	114,063	172,191	795,150	61,418	27,419	29,612	15,355	133,804	1,097	1,096,758
1965	211,691	185,622	30,774	21,196	790,704	217,963	240,112	1,486,371	71,348	38,222	95,653	48,022	253,245	8,820	1,960,127
1966	331,612	217,579	51,638	33,349	1,014,739	310,365	385,133	2,012,803	117,261	53,790	129,633	33,350	334,034	11,027	2,689,476
1967	352,112	211,019	38,683	30,500	925,409	351,368	367,238	1,924,217	87,780	39,674	38,435	34,467	200,356	2,975	2,479,660
1968	260,545	231,557	36,452	18,747	659,607	166,290	178,094	1,290,747	103,628	21,524	35,237	19,615	180,004	4,513	1,735,809
1969	284,131	184,238	42,385	26,411	692,648	259,637	404,684	1,610,003	92,225	41,959	61,341	34,292	229,817	5,964	2,129,915
1970	445,830	186,109	42,149	38,884	1,060,257	411,992	531,316	2,270,707	83,705	40,368	100,327	23,152	247,552	4,156	2,968,245
1971	321,953	168,196	44,098	31,220	594,344	211,708	357,075	1,406,641	89,951	35,707	55,610	34,927	216,195	6,439	1,951,228
1972	377,614	181,550	39,628	29,490	810,062	244,447	396,506	1,701,683	82,711	39,858	59,672	38,706	220,947	3,686	2,303,930
1973	216,982	174,892	28,646	15,328	379,436	100,262	153,785	852,349	58,172	38,949	64,705	21,233	183,059	4,020	1,256,410
1974	259,050	144,405	28,560	14,380	747,390	205,525	263,645	1,403,905	85,085	41,345	158,185	43,340	327,955	6,390	1,997,300
1975	297,570	155,705	34,215	16,725	636,080	222,985	302,565	1,368,275	92,655	49,210	61,895	48,055	251,815	4,620	1,922,280
1976	267,345	151,920	40,085	25,895	517,375	160,970	218,835	1,115,080	66,600	29,325	40,085	38,215	174,225	3,120	1,559,770
1977	176,225	165,985	27,695	9,615	270,525	65,095	78,450	617,365	36,245	13,360	36,865	9,615	96,085	800	890,475
1978	367,970	159,380	48,270	18,360	530,380	206,130	375,355	1,337,875	72,120	23,660	70,605	19,495	185,880	1,135	1,892,860
1979	380,120	199,470	53,330	19,870	883,895	340,905	391,880	1,889,350	93,070	85,225	107,970	55,425	341,690	3,135	2,614,295
1980	284,840	213,200	52,290	17,765	387,250	135,775	179,975	986,255	60,180	26,435	71,645	11,555	169,815	2,890	1,443,800
1981	245,030	203,250	33,360	14,390	404,050	170,190	199,880	1,025,120	101,170	38,260	102,850	15,460	257,740	2,610	1,530,500
1982	338,380	165,300	37,980	12,140	674,900	352,080	281,110	1,523,510	159,850	65,680	209,500	66,150	501,180	11,830	2,374,900
1983	380,720	240,635	35,490	13,700	614,505	248,420	257,755	1,410,505	197,050	53,855	248,880	46,695	546,480	34,865	2,372,570
1984	377,295	246,860	43,270	10,585	659,645	210,440	296,045	1,466,845	150,045	59,615	108,490	45,605	363,755	10,585	2,218,480
1985	230,675	184,915	32,375	14,945	364,220	100,550	114,245	811,250	66,615	31,285	121,565	24,435	243,900	12,295	1,298,120

Continued on next page

Table 4. Breeding duck species indices, May breeding duck survey, North Dakota, 1948-2008.

YEAR	MAL	GAD	WIG	GWT	BWT	SHV	PIN	TOTAL NON-MAL	RED	CAN	SCP	RUD	TOTAL DIVERS	OTHERS	TOTAL
Continued															
1986	282,045	180,560	23,660	7,780	617,625	190,210	130,430	1,150,265	105,370	41,710	199,535	27,395	374,010	15,100	1,821,420
1987	251,840	164,680	20,545	10,585	561,895	182,420	176,195	1,116,320	82,495	38,445	96,655	28,485	246,080	9,960	1,624,200
1988	246,630	358,065	29,230	12,790	562,670	162,590	78,555	1,203,900	100,480	47,500	175,380	45,670	369,030	7,300	1,826,860
1989	247,640	206,390	20,855	7,940	322,400	137,285	103,975	798,845	71,445	43,740	95,880	11,520	222,585	5,290	1,274,360
1990	118,295	358,620	16,810	14,320	282,505	81,095	35,490	788,840	46,385	11,050	107,865	9,650	174,950	10,120	1,092,205
1991	162,655	208,260	15,255	7,470	152,225	71,600	49,185	503,995	41,715	13,230	34,085	4,980	94,010	7,625	768,285
1992	230,360	325,620	22,415	14,630	308,185	126,075	136,350	933,275	91,055	25,995	50,585	16,500	184,135	8,870	1,356,640
1993	235,185	233,165	19,300	9,030	265,850	155,340	115,805	798,490	61,640	26,305	27,550	9,805	125,300	5,290	1,164,265
1994	543,939	285,447	35,369	24,930	638,517	330,944	237,925	1,553,133	154,565	38,018	65,441	28,669	286,694	13,711	2,397,477
1995	664,003	466,016	56,657	29,574	1,195,237	477,379	277,057	2,501,918	215,887	67,708	253,554	81,094	618,242	21,480	3,805,643
1996	740,116	602,210	48,718	45,605	1,273,684	434,419	302,272	2,706,909	216,042	65,373	353,170	85,452	720,037	27,239	4,194,301
1997	1,004,410	565,632	64,906	45,605	1,510,739	523,451	350,679	3,061,013	225,537	72,066	379,163	86,074	762,841	22,881	4,851,144
1998	796,461	524,074	43,115	38,913	1,269,015	315,191	236,899	2,427,206	210,594	41,092	162,187	65,529	479,402	19,301	3,722,370
1999	920,359	504,462	45,294	37,823	1,347,773	432,707	304,918	2,672,978	195,341	46,851	285,929	55,723	583,843	22,881	4,200,060
2000	878,022	604,545	59,614	31,908	1,226,678	322,662	209,349	2,454,756	197,520	44,360	101,795	79,226	422,901	19,301	3,774,979
2001	1,247,108	571,111	52,598	25,832	1,097,872	481,632	356,672	2,585,719	185,806	47,930	149,392	63,491	446,619	19,296	4,298,742
2002	1,163,815	1,065,845	61,114	47,274	1,564,712	478,029	252,232	3,469,207	264,206	46,497	362,487	73,088	746,278	38,877	5,418,177
2003	993,203	586,645	42,181	15,254	1,121,458	335,114	189,115	2,289,767	135,727	34,554	409,982	65,062	645,325	21,324	3,949,619
2004	899,657	843,779	58,524	17,121	963,318	442,669	209,505	2,534,916	204,680	35,177	527,342	69,887	837,086	35,799	4,307,458
2005	810,781	728,909	54,166	27,861	971,412	432,707	202,656	2,417,712	182,577	43,582	558,472	77,047	861,678	44,827	4,134,998
2006	888,761	550,378	48,407	26,927	986,665	393,794	217,132	2,223,305	160,475	37,823	290,132	56,501	544,931	30,974	3,687,971
2007	881,913	526,253	43,893	17,433	679,412	312,545	219,155	1,798,691	132,614	26,305	296,825	53,388	509,131	29,574	3,219,309
2008	623,845	771,401	32,220	14,942	649,994	374,805	141,330	1,984,693	249,507	35,955	434,264	59,614	779,340	40,002	3,427,880
Means:															
48-50	204,906	83,545	24,950	0	447,336	186,723	480,048	1,222,603	43,769	26,571	28,904	24,737	123,981	2,275	1,553,766
51-60	164,929	85,189	23,038	3,949	360,000	90,237	236,006	798,418	35,157	31,382	48,137	12,693	127,369	1,903	1,092,618
61-70	252,060	178,520	33,884	22,444	664,795	221,422	280,312	1,401,376	74,812	32,224	63,782	25,412	196,230	4,989	1,854,655
71-80	294,967	171,470	39,682	19,865	575,674	189,380	271,807	1,267,878	73,679	38,307	72,724	32,057	216,767	7,228	1,786,839
81-90	271,855	230,928	29,358	11,918	506,442	183,528	167,368	1,129,540	108,091	43,114	146,660	32,107	329,971	11,996	1,743,362
91-00	617,551	431,943	41,064	28,549	918,790	318,977	222,044	1,961,367	160,990	44,100	171,346	51,305	427,740	16,858	3,023,516
48-07	391,893	268,401	35,100	17,416	649,731	224,535	247,700	1,442,882	98,745	37,381	128,464	34,474	299,063	10,353	2,144,191
Low	96,256	61,733	10,001	0	152,225	50,328	35,490	432,207	21,968	11,050	16,417	2,401	61,120	0	590,528
High	1,247,108	1,065,845	64,906	47,274	1,564,712	523,451	589,007	3,469,207	264,206	85,225	558,472	86,074	861,678	44,827	5,418,177
PCT. Change of 2007 from:															
2007	-29.3%	46.6%	-26.6%	-14.3%	-4.3%	19.9%	-35.5%	10.3%	88.1%	36.7%	46.3%	11.7%	53.1%	35.3%	6.5%
48-07	59.2%	187.4%	-8.2%	-14.2%	0.0%	66.9%	-42.9%	37.6%	152.7%	-3.8%	238.0%	72.9%	160.6%	286.4%	59.9%
2008															
Counted	4008	4956	207	96	4176	2408	908	12751	1603	231	2790	383	5007	257	22023
Percent	18.20%	22.50%	0.94%	0.44%	18.96%	10.93%	4.12%	57.90%	7.28%	1.05%	12.67%	1.74%	22.74%	1.17%	100.00%

 - denotes highest count

Table 5. Breeding ducks/mile², May breeding duck survey, North Dakota, 1959-2008.

YEAR	Transect 1	Transect 2	Transect 3	Transect 4	Transect 5	Transect 6	Transect 7	Transect 8	Statewide
1959	4.35	7.77	5.09	10.67	17.51	5.16	13.56	1.93	8.36
1960	10.58	11.94	11.41	19.16	17.56	11.56	17.19	1.52	12.77
1961	7.99	11.42	13.30	21.63	21.70	10.52	24.99	0.78	14.06
1962	5.88	7.54	6.63	8.06	19.42	17.29	37.27	2.98	12.60
1963	9.88	12.92	10.65	15.32	32.02	44.17	53.87	8.48	22.68
1964	11.64	17.27	13.61	14.51	22.62	16.67	23.84	3.71	15.52
1965	10.18	17.77	19.41	31.47	35.97	51.75	56.65	4.02	27.74
1966	17.77	18.00	24.59	45.78	46.33	63.98	87.98	9.65	38.06
1967	16.57	14.29	20.20	38.50	47.16	47.35	95.25	11.63	35.09
1968	18.34	11.48	15.07	21.98	40.60	25.04	60.19	8.65	24.56
1969	13.88	21.40	24.30	38.80	44.06	35.81	58.71	6.87	30.14
1970	23.23	40.71	42.32	54.12	57.89	44.42	65.75	7.28	42.00
1971	16.20	22.92	31.71	33.53	36.84	22.33	55.35	3.93	27.61
1972	24.80	30.83	33.95	36.17	46.73	23.62	57.65	7.39	32.60
1973	18.66	22.37	22.96	16.35	25.13	9.46	22.60	2.70	17.78
1974	17.54	25.20	31.45	32.93	39.87	19.88	52.90	7.22	28.26
1975	25.66	29.23	29.41	20.33	40.92	18.85	45.98	7.06	27.20
1976	26.05	23.97	30.55	25.33	29.90	10.15	23.81	4.04	22.07
1977	19.39	22.29	13.07	15.35	11.98	7.58	6.94	0.94	12.60
1978	25.96	30.78	21.82	42.35	34.94	20.40	29.06	5.30	26.79
1979	28.70	37.54	32.28	46.85	48.63	34.21	58.81	8.59	37.00
1980	27.46	32.03	16.46	24.35	22.75	13.69	21.42	1.93	20.44
1981	27.52	21.66	16.73	24.30	32.05	24.54	21.85	2.65	21.66
1982	30.93	25.55	35.34	37.05	67.30	31.21	34.25	6.00	33.61
1983	29.95	28.12	31.54	42.33	66.51	23.23	36.63	5.11	33.57
1984	16.88	22.83	43.79	38.75	65.98	17.63	35.73	4.78	31.39
1985	13.86	20.05	25.54	24.92	37.46	7.77	9.63	2.04	18.37
1986	18.95	19.83	30.82	32.52	49.16	16.15	25.02	7.39	25.78
1987	11.50	13.37	25.36	24.62	57.48	13.42	31.27	2.04	22.98
1988	13.54	16.77	36.88	35.43	59.95	13.35	24.15	1.96	25.94
1989	12.27	11.35	21.30	15.92	39.71	6.84	27.37	5.48	18.03
1990	8.91	17.97	17.64	23.48	29.90	2.54	16.12	3.43	15.46
1991	8.46	10.48	16.13	11.45	23.46	3.92	8.06	2.26	10.87
1992	8.14	12.52	19.93	15.17	37.83	21.85	37.02	2.30	19.20
1993	7.04	8.71	13.80	11.97	41.81	10.65	33.81	4.04	16.54
1994	18.48	16.45	30.98	17.53	101.60	15.50	61.52	6.52	33.93
1995	29.88	25.82	59.02	53.77	141.13	31.31	74.75	8.54	53.85
1996	24.54	34.78	79.55	46.60	157.32	29.88	77.69	16.06	59.35
1997	37.96	43.46	58.59	86.77	129.71	90.46	81.85	17.11	68.65
1998	31.75	28.86	52.63	41.22	111.03	49.79	92.73	14.93	52.68
1999	35.36	33.85	80.85	34.70	131.81	30.67	111.90	17.94	59.44
2000	32.89	24.72	57.89	41.02	122.08	45.12	96.48	8.02	53.42
2001	36.55	18.75	47.75	62.22	114.68	100.04	93.83	18.78	60.83
2002	42.23	33.15	49.29	84.95	150.98	109.21	135.02	14.69	76.74
2003	39.84	35.43	34.43	51.68	91.06	99.87	89.25	11.07	55.89
2004	42.88	25.95	42.89	81.02	130.43	89.23	65.15	6.28	60.96
2005	39.29	29.31	33.38	81.25	100.70	83.54	95.58	8.22	58.52
2006	34.30	25.77	44.50	50.63	81.71	61.69	87.10	31.70	52.19
2007	29.00	17.85	25.86	35.05	65.41	92.94	91.52	18.54	45.56
2008	29.38	19.25	31.83	29.20	97.52	110.29	75.90	9.83	48.51
Average									
1959 to 2007	21.71	22.31	30.67	35.10	60.79	34.21	52.35	7.44	33.09
Percent Change									
2007 to 2008	1.3%	7.8%	23.1%	-16.7%	49.1%	18.7%	-17.1%	-47.0%	6.5%
Percent Change									
Mean to 2008	35.4%	-13.7%	3.8%	-16.8%	60.4%	222.4%	45.0%	32.2%	46.6%
Min	4.35	7.54	5.09	8.06	11.98	2.54	6.94	0.78	8.36
Max	42.88	43.46	80.85	86.77	157.32	110.29	135.02	31.70	76.74

 - Denotes highest count

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Table 6. Number of lone drakes per 100 paired drakes, May breeding duck survey, North Dakota, 1956-2008.

Year	Pintail	Mallard	Canvasback	Blue-winged Teal
1956	199	125	111	7
1957	259	172	235	55
1958	161	129	105	44
1959	218	121	12	55
1960	294	169	90	61
1961	193	93	43	37
1962	220	118	96	67
1963	157	133	155	42
1964	182	126	233	50
1965	163	97	156	29
1966	233	113	170	28
1967	196	160	210	39
1968	170	126	156	27
1969	389	317	176	96
1970	224	174	202	46
1971	288	204	259	63
1972	203	163	237	50
1973	203	198	205	40
1974	216	168	170	44
1975	261	243	409	63
1976	280	158	327	89
1977	171	161	72	38
1978	218	210	162	75
1979	241	153	297	56
1980	163	168	112	53
1981	167	172	73	37
1982	275	226	170	59
1983	171	168	131	52
1984	158	155	68	32
1985	205	187	147	79
1986	215	201	97	52
1987	243	232	188	65
1988	126	153	118	30
1989	185	134	60	40
1990	143	76	114	50
1991	295	199	107	47
1992	170	197	197	45
1993	232	185	138	58
1994	280	221	257	72
1995	219	174	143	40
1996	178	136	148	29
1997	184	178	160	25
1998	175	176	233	33
1999	206	166	134	30
2000	196	275	141	50
2001	244	257	156	70
2002	135	104	65	24
2003	325	374	283	83
2004	154	155	95	31
2005	252	259	142	40
2006	248	282	262	46
2007	338	266	83	32
2008	186	171	70	39
Min	126	76	12	7
Max	389	374	409	96
1956-2007				
Mean	216.1	180.0	160.8	49.0

Table 7. Coot indices, May breeding duck survey, North Dakota, 1948-2008.

Year	Coot Index	Pct. Change from previous Year	Running Average	Pct. Change of Annual Index from previous Running Avg.
1948	214,174		214,174	
1949	190,059	-11.3	202,117	-11.3
1950	263,781	38.8	222,671	30.5
1951	209,701	-20.5	219,429	-5.8
1952	142,400	-32.1	204,023	-35.1
1953	83,144	-41.6	183,877	-59.2
1954	80,804	-2.8	169,152	-56.1
1955	109,663	35.7	161,716	-35.2
1956	203,708	85.8	166,382	26.0
1957	56,050	-72.5	155,348	-66.3
1958	137,827	145.9	153,756	-11.3
1959	40,986	-70.3	144,358	-73.3
1960	181,609	343.1	147,224	25.8
1961	110,944	-38.9	144,632	-24.6
1962	159,703	43.9	145,637	10.4
1963	322,939	102.2	156,718	121.7
1964	96,104	-70.2	153,153	-38.7
1965	413,390	330.1	167,610	169.9
1966	839,500	103.1	202,973	400.9
1967	942,671	12.3	239,958	364.4
1968	436,710	-53.7	249,327	82.0
1969	431,057	-1.3	257,587	72.9
1970	806,288	87.0	281,444	213.0
1971	508,081	-37.0	290,887	80.5
1972	654,358	28.8	305,426	125.0
1973	443,776	-32.2	310,747	45.3
1974	850,100	91.6	330,723	173.6
1975	570,267	-32.9	339,278	72.4
1976	346,965	-39.2	339,543	2.3
1977	81,971	-76.4	330,958	-75.9
1978	274,180	234.5	329,126	-17.2
1979	915,690	234.0	347,456	178.2
1980	196,275	-78.6	342,875	-43.5
1981	227,870	16.1	339,493	-33.5
1982	573,260	151.6	346,172	68.9
1983	610,615	6.5	353,517	76.4
1984	516,290	-15.4	357,916	46.0
1985	190,200	-63.2	353,503	-46.9
1986	289,660	52.3	351,866	-18.1
1987	310,055	7.0	350,821	-11.9
1988	317,681	2.5	350,012	-9.4
1989	148,334	-53.3	345,210	-57.6
1990	121,718	-17.9	340,013	-64.7
1991	15,409	-87.3	332,636	-95.5
1992	136,661	786.9	328,281	-58.9
1993	87,164	-36.2	323,039	-73.4
1994	505,240	479.6	326,916	56.4
1995	1,542,647	205.3	352,243	371.9
1996	1,358,358	-11.9	372,776	285.6
1997	1,529,417	12.6	395,909	310.3
1998	851,250	-44.3	404,837	115.0
1999	986,043	15.8	416,014	143.6
2000	548,199	-44.4	418,508	31.8
2001	426,014	-22.3	418,647	1.8
2002	555,982	30.5	421,144	32.8
2003	209,194	-62.4	417,360	-50.3
2004	492,477	135.4	418,677	18.0
2005	136,349	-72.3	413,810	-67.4
2006	162,654	19.3	409,553	-60.7
2007	159,074	-2.2	405,378	-61.2
2007	274,100	72.3	403,226	-32.4
Min	15,409	-87	144,358	-95.5
Max	1,542,647	787	421,144	400.9
Average	403,226			

*Coot indices represent the number of coots per square mile in the sample times the total square miles in the state (70,665).

1,542,647 - Denotes highest count

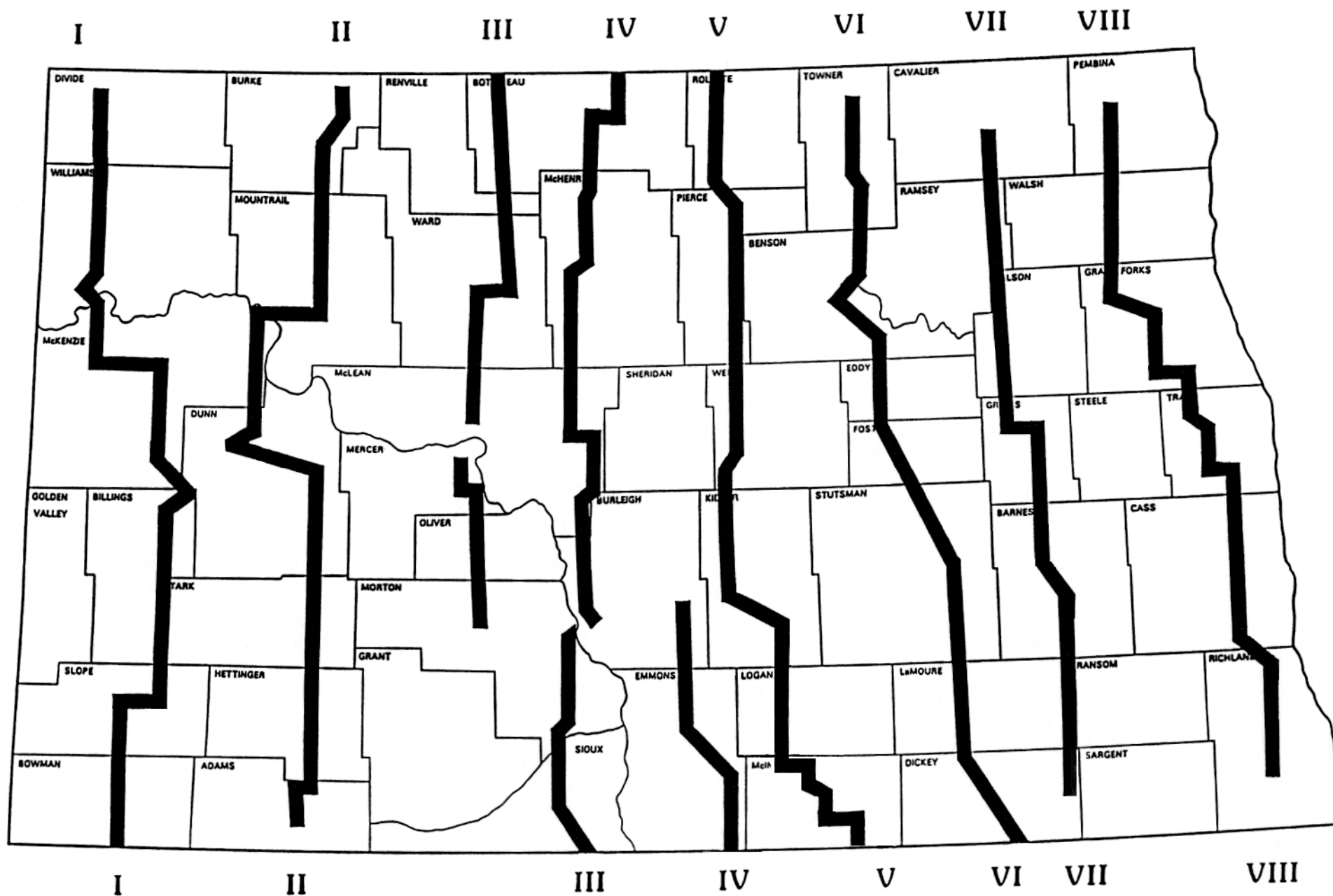
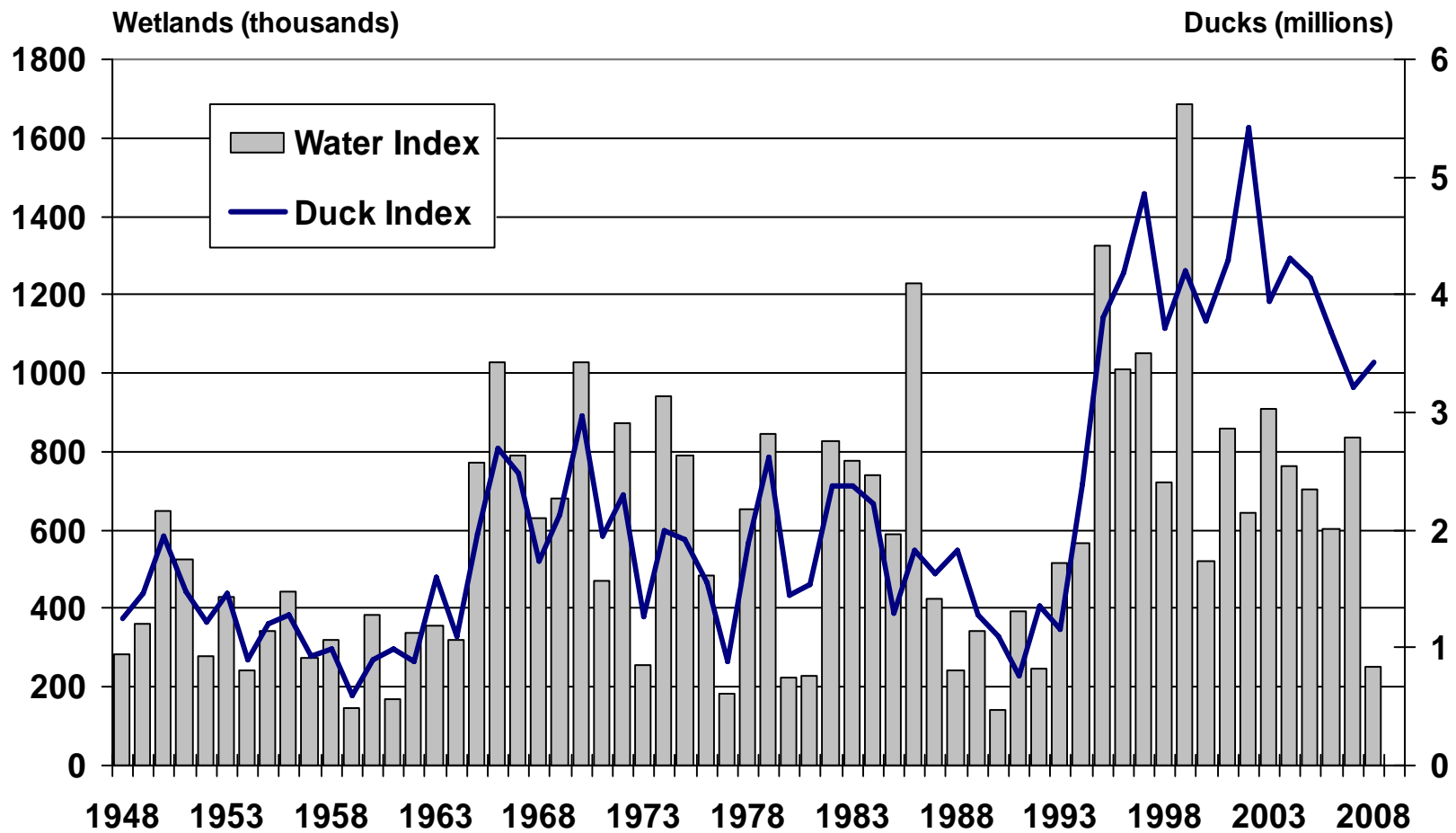


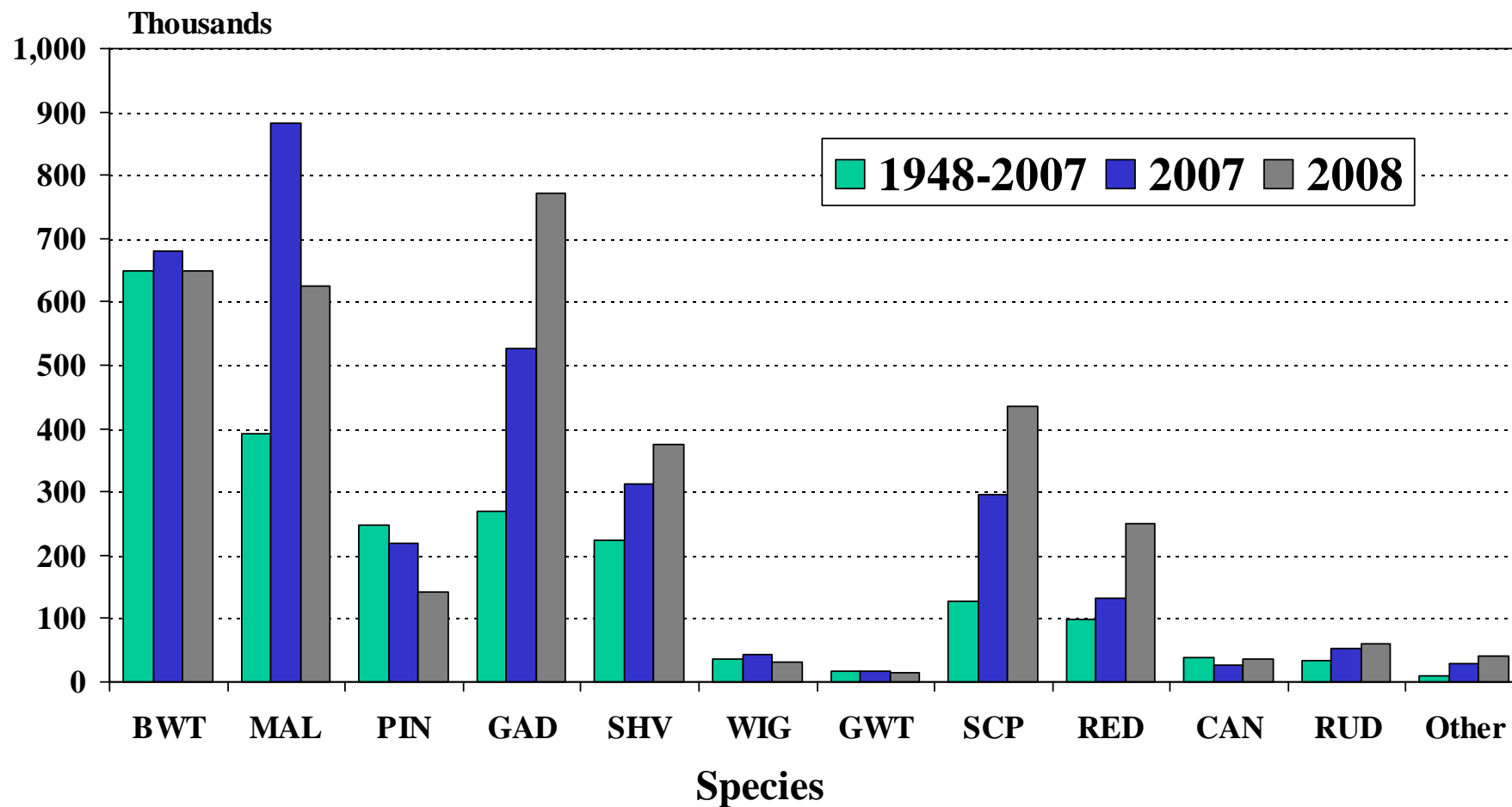
Figure 1. Location of the eight ground transects used for the Breeding Duck Survey in North Dakota.

Figure 2. Breeding duck and water indices for North Dakota, 1948-2008



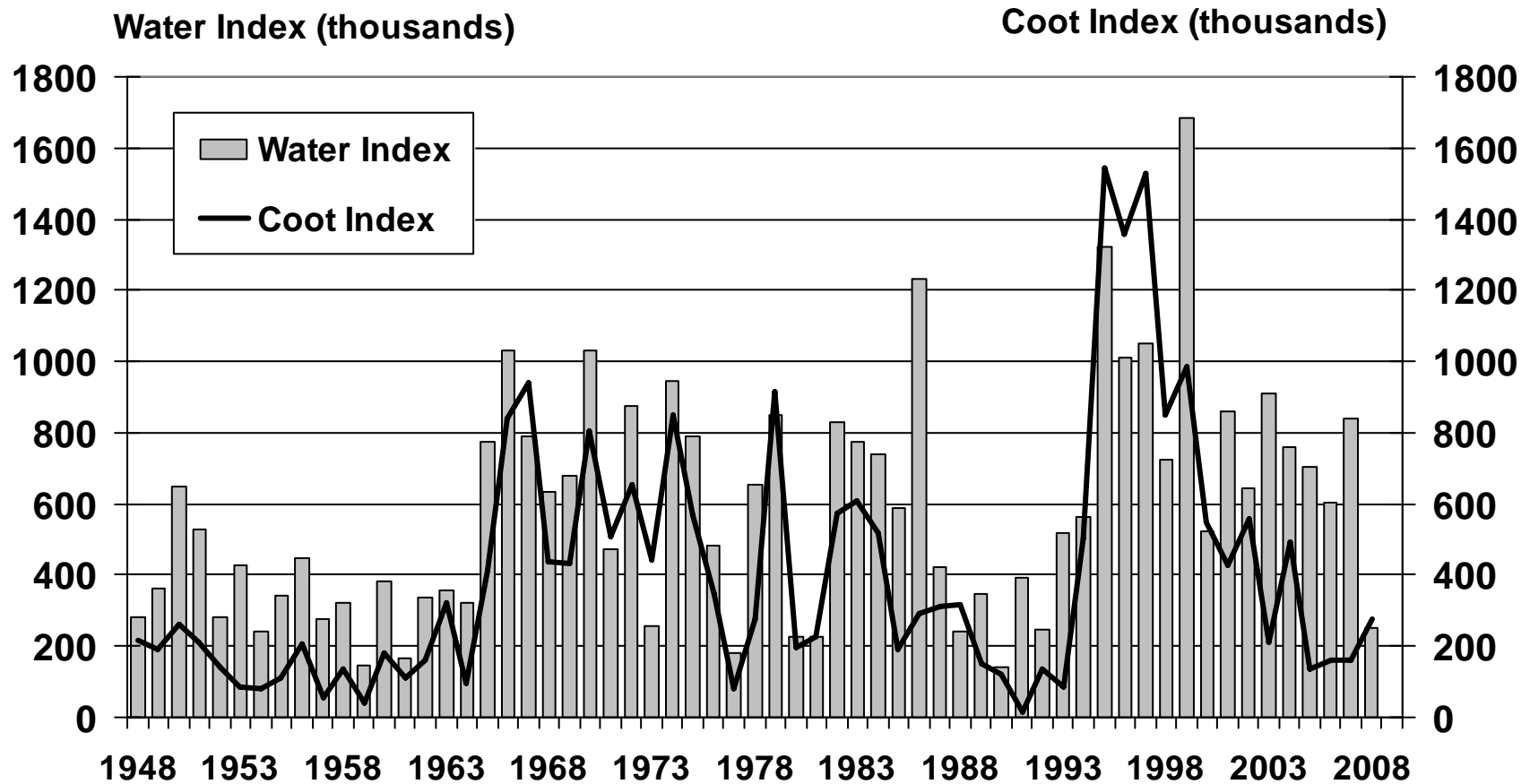
Source: NDGFD Mid-May Duck Survey
Duckindx.ppt M. Johnson 5/08

Figure 3. Breeding duck species indices for North Dakota, 1948-2008.



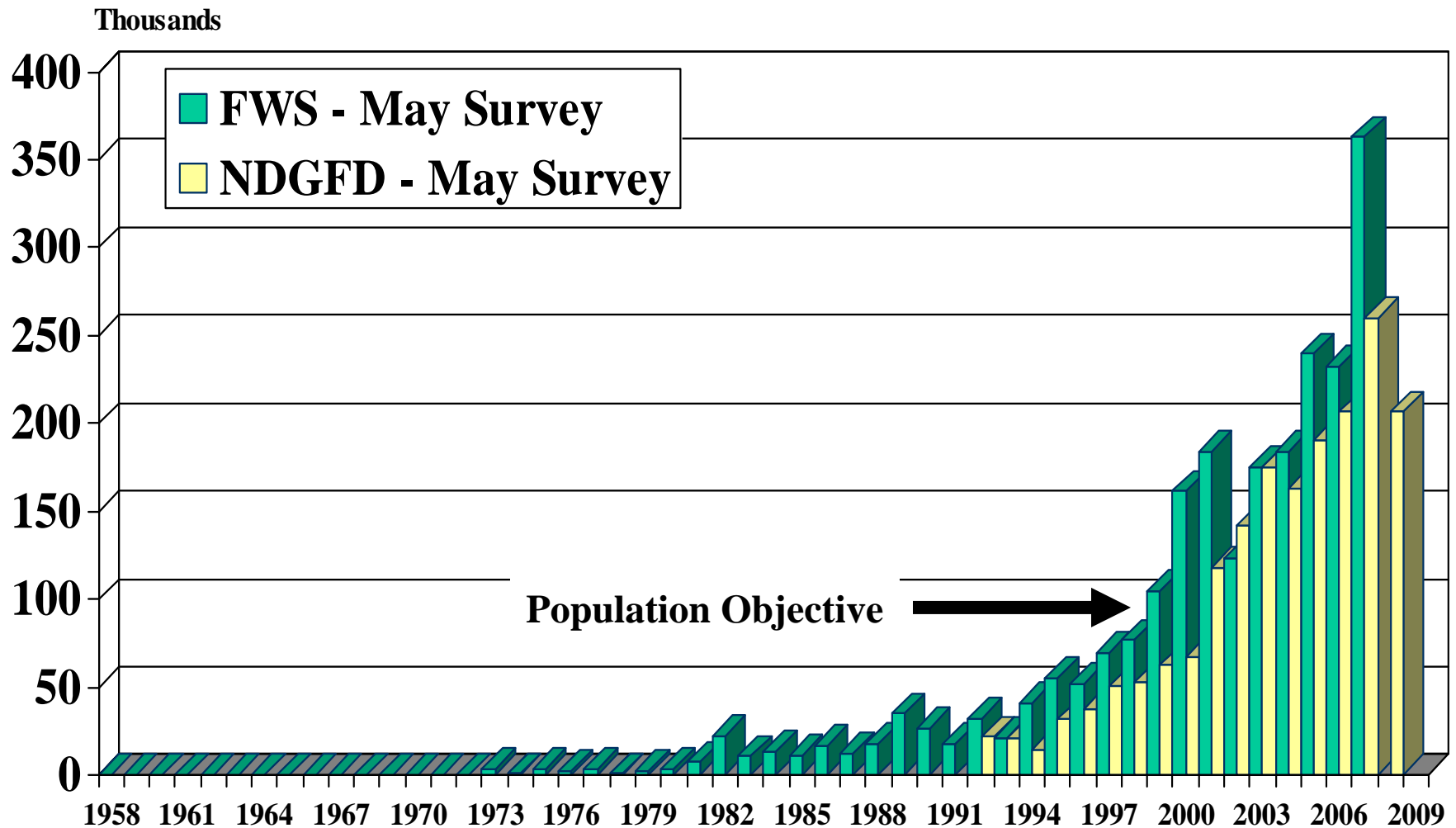
Source: NDGFD Mid-May Duck Survey
Duckindx.ppt M. Johnson 6/08

Figure 4. Coot and water indices for North Dakota, 1948-2008



Source: NDGFD Mid-May Duck Survey
Duckindx.ppt M. Johnson 5/08

North Dakota Canada Goose Population Indices



Canada Goose Population Data, North Dakota, 1958-2008.

Year	FWS May Survey	Change from previous year	NDGFD May Survey	Change from previous year
1958	0.0			
1959	0.0			
1960	0.0			
1961	0.0			
1962	0.0			
1963	0.0			
1964	0.0			
1965	0.1			
1966	0.1	0.00%		
1967	0.0	-100.00%		
1968	0.0			
1969	0.0			
1970	0.0			
1971	0.0			
1972	0.0			
1973	3.8			
1974	0.9	-76.32%		
1975	3.3	266.67%		
1976	2.2	-33.33%		
1977	3.8	72.73%		
1978	0.9	-76.32%		
1979	2.7	200.00%		
1980	3.7	37.04%		
1981	7.4	100.00%		
1982	22.4	202.70%		
1983	10.5	-53.13%		
1984	13.7	30.48%		
1985	11.3	-17.52%		
1986	17.0	50.44%		
1987	12.3	-27.65%		
1988	18.0	46.34%		
1989	34.9	93.89%		
1990	26.6	-23.78%		
1991	18.0	-32.33%		
1992	32.1	78.33%	21.90	
1993	21.2	-33.96%	20.40	-6.85%
1994	40.9	92.92%	14.80	-27.45%
1995	55.5	35.70%	31.40	112.16%
1996	51.8	-6.67%	37.50	19.43%
1997	69.5	34.17%	50.40	34.40%
1998	76.5	10.07%	52.30	3.77%
1999	104.5	36.60%	62.60	19.69%
2000	161.6	54.64%	67.20	7.35%
2001	184.1	13.92%	117.70	75.15%
2002	122.9	-33.24%	141.95	20.60%
2003	175.3	42.64%	175.26	23.47%
2004	183.8	4.85%	163.12	-6.93%
2005	239.8	30.47%	190.67	16.89%
2006	232.6	-3.00%	206.86	8.49%
2007	362.8	55.98%	259.78	25.58%
2008		-100.00%	206.55	-20.49%