

PRELIMINARY PROGRESS REPORT
W-67-R-51-D-I-4

2011 Waterfowl Breeding Ground Survey in North Dakota
with Comparable Data for 1948-2010
by
M. Johnson, M. Szymanski and J. Job

Survey Dates: May 16-20, 2011
1814 Transect Miles on 8 Transects

RESULTS

	2011 Index	2010 Index	1948-2010 Avg. Index	Percent change of the 2011 index from:	
				2010 Index	1948-2010 Average Index
Water areas	1,364,272	1,038,030	598,396	+31.4%	+128.0%
Coots	522,673	725,952	408,597	-28.0%	+27.9%
Ducks	4,124,102	4,547,626	2,232,953	-9.3%	+84.7%

Year	<u>Units Per Square Mile</u>		
	<u>Water Areas</u>	<u>Coots</u>	<u>Ducks</u>
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
2009	14.00	5.93	57.30
2010	14.69	10.27	64.35
2011	19.33	7.40	58.43



"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

MEMO

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

FROM: M. Johnson, M. Szymanski and J. Job

SUBJECT: Results of 2011 May Breeding Duck Survey

Date: 13 June 2011

Thanks for all your help with our **64th Annual May Breeding Duck Survey**. Your efforts are greatly appreciated. Attached are summary tables and charts of the results.

The survey was completed during 16-20 May 2011. Weather conditions were not conducive to a good survey with strong winds (to 45mph) and scattered rain showers making survey conditions difficult.

This year, "touch-screen" tablet computers were used to record all data on all transects. 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 from 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. This year, a problem with computer data entry on part of route 7 required the observers to reconstruct their data from the voice recorder. Only a minimal amount of information was lost; two 18 mile segments lost geo-reference information.

Weather and migration history:

The winter of 2010-11 had below normal temperatures and above average precipitation, especially in December and January. Two to six inches of snow blanketed the state from the first snow storm occurring on 20-21 November. Five blizzards were reported in December, with the biggest snowfall totaling 14 inches in parts of the state. January brought more snow with 23 days of consecutive snow falling in Bismarck. Most of these snowfalls were not heavy, but the average snow depth across the state on 30 January was 24.3 inches, 11 inches more than the same time as last year. February started off with very cold temps but then warmed up the second and third week to melt much of the snow across the state. More snow fell during the last week of

February and the second and third week of March. Snowfall accumulations varied from 4 to 12 inches throughout the state from these snowfalls. April was a very wet month with numerous small rain and snow showers. The last two snowfalls occurred on 14-15 April and 1 May. Moderate to severe flooding occurred in the eastern and central portions of North Dakota during the months of April and May.

As temperatures increased during the third and fourth week of March, Canada geese as well as small numbers of ducks began migrating back into North Dakota. Mallards, pintail, redhead, lesser scaup, shoveler, and swans were reported at Tewaukon Refuge on 25 March. A pair of wood ducks was reported in the Fargo area on 28 March. All common waterfowl species except blue-winged teal had been reported in North Dakota by 1 April. Blue-winged teal were observed in McHenry County on 2 April. The first big flight of snow geese into the state occurred on 1 April. Sandhill cranes started moving into the state during the second week in April.

April was cool with below average temperatures and scattered rain and snow showers brought precipitation across parts of the state. The Missouri Coteau region of the state opened significantly later than other regions and birds arrived there late. Large wetlands on the Test Run were still ice covered on 27 April. The week of the breeding ground survey (16-20 May) had very windy conditions (up to 45 mph) and scattered light showers in some parts of the state.

Phenology:

The starting date of the 2011 survey, 16 May, was about 3 days later than the long-term average starting date (Appendix A), and was 6 days later than last year. The timing of our survey appeared to be appropriate based on vegetation phenology. Despite the late survey date, crews noted wetland vegetation green-up was only slightly advanced, especially in shallow wetlands with some areas having wetland vegetation up to 12 inches or more high. These growing vegetation conditions were not extensive, but made survey conditions difficult on some wetlands. Agricultural planting was delayed across the state due to cool weather and wet field conditions. These same conditions appeared to have delayed leaf-out and native plant development. At least a few small patches of snow drifts were observed during the survey.

Lone drake ratios for mallards, pintails, canvasbacks and blue-winged teal were all high and well above the long-term average. This is an indication that nesting efforts were advanced for these species at the time of our survey. Mallards and pintails were not observed on the Test Run until the first week of April. Nesting activity appeared to begin late. Indicted numbers of mallards, pintails, gadwalls, and blue-wings all peaked the week of the survey (Appendix I.) Scaup migration peaked the week of 20 April and the number of birds on the Test Run appeared to have increased two weeks after the May survey. Canada goose nesting efforts appeared to be delayed or terminated by weather with few broods observed during the survey. More pairs than normal appeared to be non-breeding, which may be due to weather caused nest loss. No duck broods were observed on our surveys or on the Test Run prior to or during the statewide survey. The correction factor for absent females (for all duck species combined) was 1.31, well above the long-term average of 1.24.

Results of the survey in brief:

The 2011 water index was up 31.4% from 2010 and up 128.0% from the 1948-2010 average (Table 1). Compared to 2010, water indices observed on individual transects ranged from down 42.3% on transect 8 to up 200% on transect 2 (Table 2). The wetland index is the 2nd highest in

survey history and it is the highest index since 1999. Water conditions were exceptional throughout the state, with the abundant snow cover and significant spring rains filling most basins. Once again, observers noted many cases of water from multiple wetland basins merging to create a single water area. These situations would tend to reduce our total pond count, but we have not been able to quantify this impact at this time.

Numbers of breeding ducks in North Dakota decreased from last year, but numbers remain high compared to the 63-year average. **The 2011 duck index was down 9.3% from 2010, but exceeded the 1948-2010 average index by 85% (Table 3). The 2011 index is the 9th highest on record.** Compared to 2010, total ducks observed on individual transects ranged from down 40% (transects 7 and 8) to up 60% (transect 2) (Table 5). Figure 2 demonstrates the remarkable high numbers of ducks settling in North Dakota since 1994, compared to breeding population indices going back to 1948.

Changes from 2010 in the indices for individual species were highly variable (Table 4). Wigeon, blue-winged teal, and pintails (highest level since 1970) were the only ducks to show an increase in numbers (+15%, +12%, and +4% respectively). Shovelers were down 13% from their record high last year. Mallards were down 4% from last year, but had the sixth highest count on record. Indices for all other species were below that of 2010, with the most significant decreases for ruddy duck (-62%), lesser scaup (-58%), and redhead (-33%). Last year (2010), redheads and ruddy ducks were at record highs and scaup numbers were also well above average, so these declines are not surprising.

All species, except scaup, were above the long-term (1948-2010) average. Scaup were down 17% from the average. Increases for other species were northern shovelers (+168%), mallard (+132%), canvasback (+94%), redhead (+79%), blue-winged teal (+75%), northern pintail (+66%), gadwall (+49%), ruddy duck (+45%), green-winged teal (+43%), and wigeon (+37%).

Regional Population Estimates:

In addition to recording all current data in digital format, we have been working to convert all previous data for the May Breeding Duck survey into digital format. This is a long and tedious process and we now have converted these data from 1985 through the present. Having these data in digital format gives us the opportunity to look at a variety of aspects of this data set that could not be done before. Appendix J. contains some examples showing the distribution and densities of ducks and Canada geese by region. These estimates are derived using regional expansion factors. As such, estimates may not add up to the total traditional estimates that use a statewide expansion factor. Upon completion of the data digitization, we will undertake an extensive analysis of the complete data set looking at a variety of population and landscape changes over time.

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 high and well above average. The correction for females (hens presumably on nests) was the third highest on record (Appendix B). Both of these are consistent with our observations that the nesting effort was well underway at the time of our survey. **The large number of ducks tallied during our survey is consistent with the “well above average” populations we have been carrying since 1994 following wet conditions that have been in place since the summer of 1993.** 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, most scaup appeared to have passed through North Dakota by the time of our survey. Our Test Run surveys indicated that mallards, gadwall, and blue-winged teal were all at peak levels during our statewide survey. Scaup numbers on the Test Run increased two weeks after our survey, with most settling on wetlands known to have broods in previous years.

Overview:

The unprecedented wetland conditions that began in the summer of 1993 continue and the dynamic fluctuations of northern prairie wetlands continue to surprise us. Pond numbers were high once again across the state. We again caution that our wetland index is based on basins with water, and does not represent amount or volume of water in the state.

Large numbers of lone males indicated that breeding activity was well advanced for the early and mid-season nesting species at the time of the survey, which was later than average. Aquatic food resources in many wetlands will be recharged as a result of the flooding of wetland margins and upland vegetation. Additionally, reports indicate that all of the Prairie Pothole Region in the U.S. and Canada, from Des Moines, IA to north of Edmonton, AB, has excellent water conditions this year. To our knowledge, this is an unprecedented occurrence, at least since surveys have been conducted. This spring has been exceptionally cool and wet soil conditions, flooded roads and fields and periodic rains have hampered planting activity.

The population of red fox, formerly the principle duck nest predator, appears to be stable at relatively low numbers since 1998 (Appendix H). Observers did not note any red fox during the statewide survey.

Nesting cover in North Dakota continues to decline. During our survey, we noted many large tracts of grassland/CRP that had been converted to cropland since last year or were 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 currently has about 2,642 million acres of CRP, down about 22% from the 3.387 million acres in 2007. Projections are that another 0.387 million acres will be lost in 2010-2011 and 1.098 million acres will be lost in 2012-13. This loss of critical nesting cover will be disastrous for breeding ducks and hunting opportunities in North Dakota. Additionally, wind energy and oil developments continue to fragment prairie grasslands, throughout the Missouri Coteau and the Drift Prairie. These developments can only further reduce waterfowl production in North Dakota.

As usual, we are still waiting to see what brood water conditions will be throughout the state. At this time, conditions look very good. Water levels in most seasonal, semi-permanent and permanent wetlands are again good. Numbers of mink, a significant brood predator, are unknown, but trend indices indicate that their numbers remain low. Muskrat numbers were extraordinarily high this spring. Large numbers of muskrats were struck by vehicles on highways during the ice break-up period. Numbers have definitely rebuilt from recent lows and hunters and trappers throughout much of the state harvested large numbers of rats this spring. This large muskrat population will undoubtedly spur a population spike in mink leading to increased nest and duckling predation.

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 again be high across the

state due to excellent water conditions and increased wetland availability for brood production. 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 64rd Annual Survey.

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

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Table 1. Water indices, May breeding duck survey, North Dakota, 1948-2011.

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
2009	989,467	293.1	591,305	69.2
2010	1,038,030	4.9	598,396	75.5
2011	1,364,272	31.4	610,363	128.0
Min	141,330	-73.5	282,660	-72.9
Max	1,684,911	293.1	610,363	208.0
Average	610,363			

*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

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M. Johnson 6/2011

Table 2. Water areas/mile², May breeding duck survey, North Dakota, 1959-2011.

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
2009	5.18	5.43	13.71	15.58	14.24	33.75	17.98	9.19	14.00
2010	4.84	4.48	14.25	13.67	17.71	34.58	15.85	15.07	14.69
2011	11.27	13.42	31.25	20.42	20.38	33.27	16.96	8.69	19.33
Average 1959-2010	5.04	6.35	9.88	6.79	8.61	13.51	16.40	8.31	9.14
Percent Change 2010 to 2011	132.9%	199.6%	119.3%	49.4%	15.1%	-3.8%	7.0%	-42.3%	31.6%
Percent Change Mean to 2011	123.5%	111.4%	216.2%	200.7%	136.8%	146.3%	3.4%	4.6%	111.6%
Min	1.61	1.63	1.62	0.68	1.84	1.71	2.06	1.11	2.00
Max	11.27	15.57	31.25	20.42	23.95	34.58	44.77	33.91	23.84

☐ - Denotes highest count

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M. Johnson 6/2011

Table 3. Breeding duck indices, May breeding duck survey, North Dakota, 1948-2011.

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
2009	4,049,079	18.1	2,195,619	87.0
2010	4,547,626	12.3	2,232,953	107.1
2011	4,124,102	-9.3	2,262,502	84.7
Min	590,528	-45	1,164,732	-54
Max	5,418,177	113	2,262,502	186
Average	2,262,502			

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

☐ - Denotes highest count

Table 4. Breeding duck species indices, May breeding duck survey, North Dakota, 1948-2011.

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, 1948-2011.

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
2009	890,162	450,918	46,228	16,966	996,627	757,704	362,976	2,631,419	210,127	70,354	175,262	53,855	509,598	17,900	4,049,079
2010	999,896	494,189	42,181	32,375	1,031,337	748,832	399,242	2,748,156	280,014	77,825	270,208	141,019	769,067	30,507	4,547,626
2011	956,936	419,944	48,407	25,215	1,156,479	653,263	415,119	2,718,427	188,959	74,556	112,691	53,388	429,594	19,145	4,124,102
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
2001-2010	939,914	658,943	48,151	24,199	1,006,281	475,783	255,002	2,468,358	200,573	45,600	347,436	71,295	664,905	30,908	4,104,086
48-10	413,135	282,866	35,343	17,607	661,299	243,705	250,247	1,491,066	105,783	38,524	136,310	36,871	317,488	11,263	2,232,953
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	757,704	589,007	3,469,207	280,014	85,225	558,472	141,019	861,678	44,827	5,418,177
PCT. Change of 2011 from:															
2010	-4.3%	-15.0%	14.8%	-22.1%	12.1%	-12.8%	4.0%	-1.1%	-32.5%	-4.2%	-58.3%	-62.1%	-44.1%	-37.2%	-9.3%
<u>48-10</u>	131.6%	48.5%	37.0%	43.2%	74.9%	168.1%	65.9%	82.3%	78.6%	93.5%	-17.3%	44.8%	35.3%	70.0%	84.7%
2011															
Counted	6,148	2,698	311	162	7,430	4,197	2,667	17,465	1,214	479	724	343	2,760	123	26,496
Percent	23.20%	10.18%	1.17%	0.61%	28.04%	15.84%	10.07%	65.92%	4.58%	1.81%	2.73%	1.29%	10.42%	0.46%	100.00%

☐ - denotes highest count
 \prw-67r-51\pop\table4.xls M. Johnson 6/2011

Table 5. Breeding ducks/mile², May breeding duck survey, North Dakota, 1959-2011.

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
2009	36.57	23.94	39.96	72.98	91.98	102.50	74.92	19.85	57.30
2010	31.36	18.32	52.46	84.43	111.14	111.60	95.81	15.96	64.35
2011	38.25	29.23	64.48	90.34	84.73	92.71	58.00	9.72	58.43
Average 1959 to 2010	22.33	22.20	31.29	36.66	63.07	38.47	54.07	7.89	34.45
Percent Change 2010 to 2011	22.0%	59.6%	22.9%	7.0%	-23.8%	-16.9%	-39.5%	-39.1%	-9.2%
Percent Change Mean to 2011	71.3%	31.7%	106.1%	146.4%	34.4%	141.0%	7.3%	23.2%	69.6%
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	90.34	157.32	111.60	135.02	31.70	76.74

☐ - Denotes highest count

\\prw-67r-51\bpop\table5.xls

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Table 6. Number of lone drakes per 100 paired drakes, May breeding duck survey, North Dakota, 1956-2011.

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
2009	315	319	278	81
2010	342	413	264	67
2011	314	331	257	59
Min	126	76	12	7
Max	389	413	409	96
1956-2010				
Mean	219.4	185.6	162.2	48.9

Table 7. Coot indices, May breeding duck survey, North Dakota, 1948-2011.

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
2008	274,100	72.3	403,226	-32.4
2009	418,854	52.8	403,478	3.9
2010	725,952	73.3	408,597	79.9
2011	522,673	-28.0	410,379	27.9
Min	15,409	-87.3	144,358	-95.5
Max	1,542,647	786.9	421,144	400.9
Average	410,379			

*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

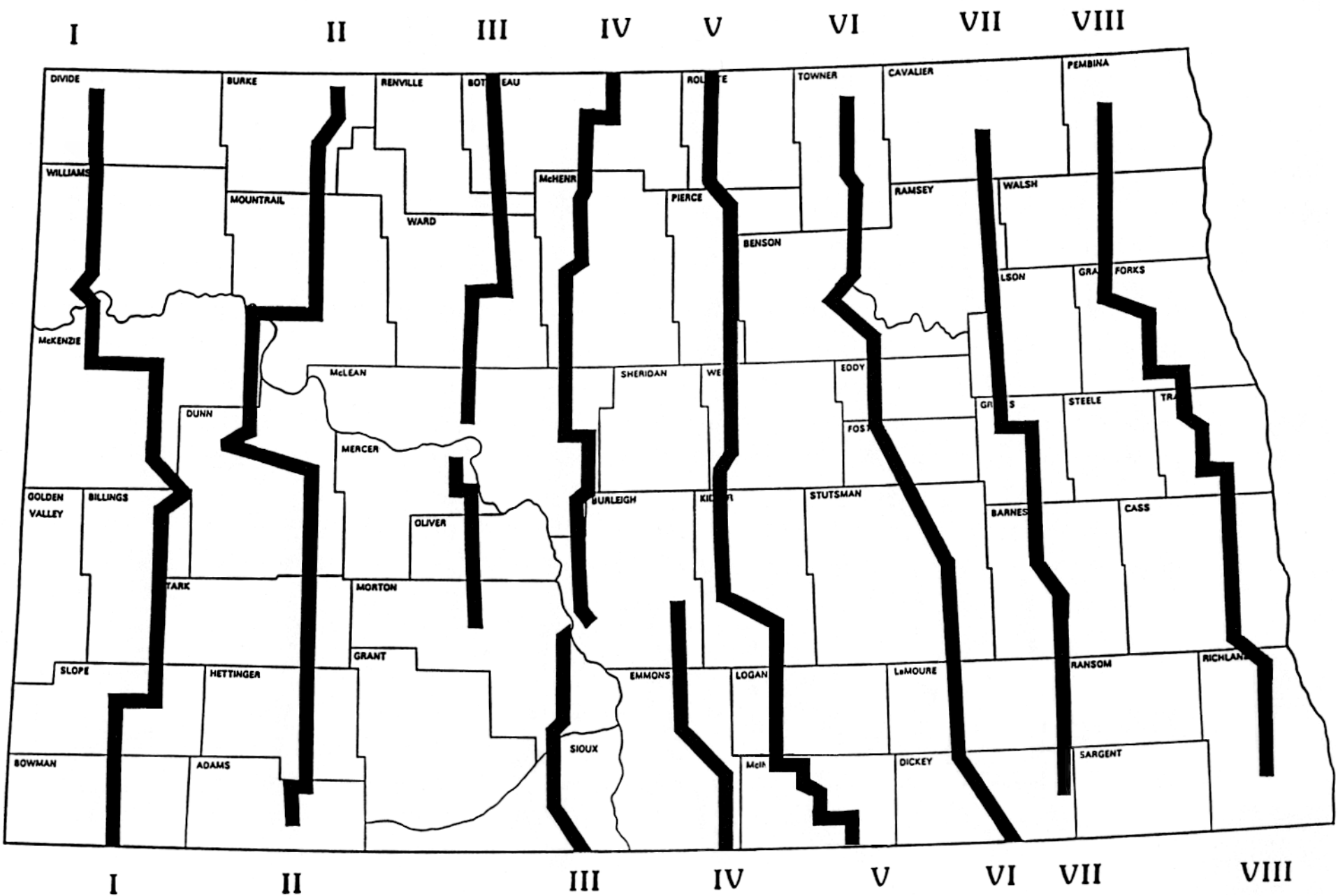
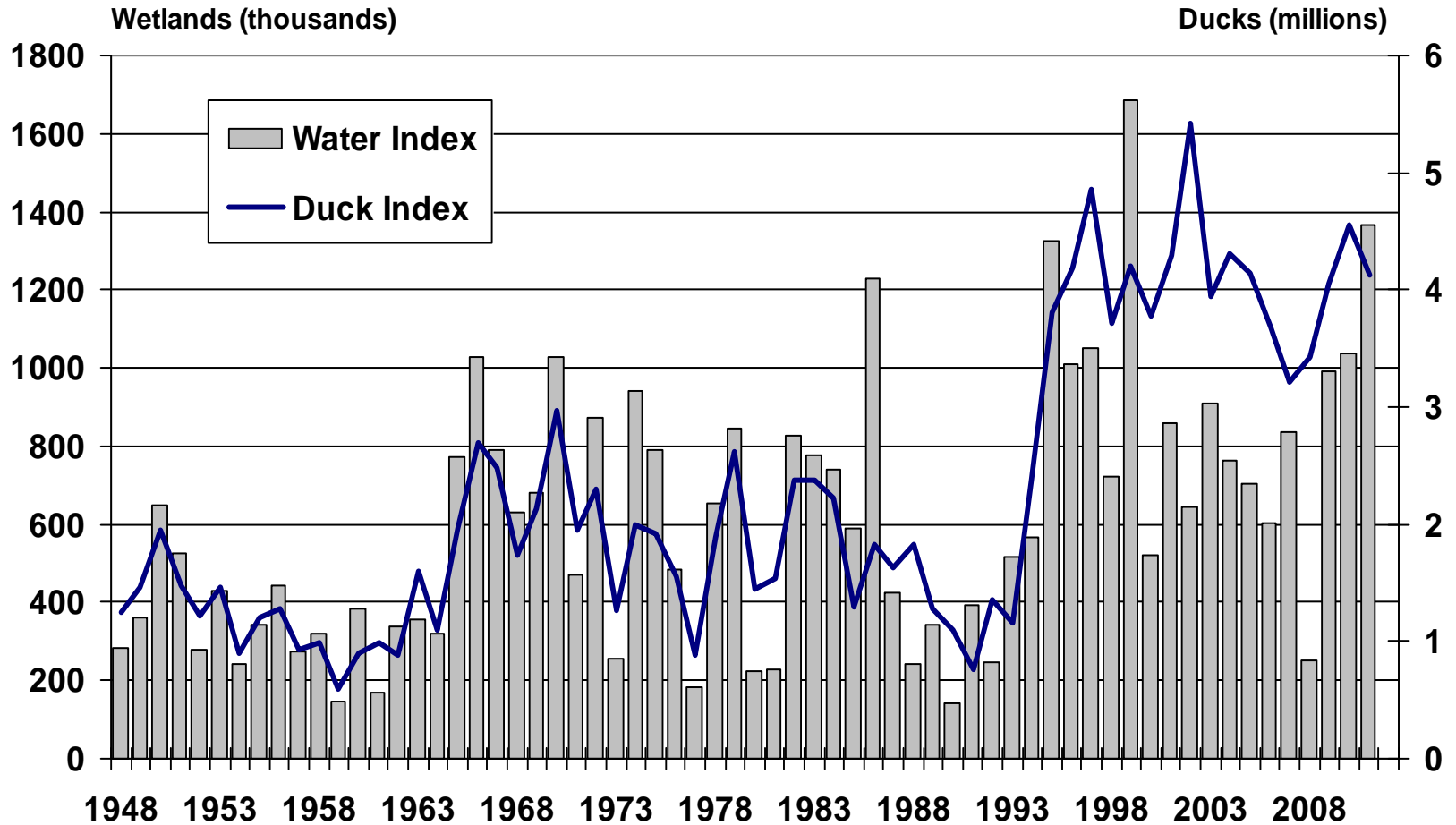


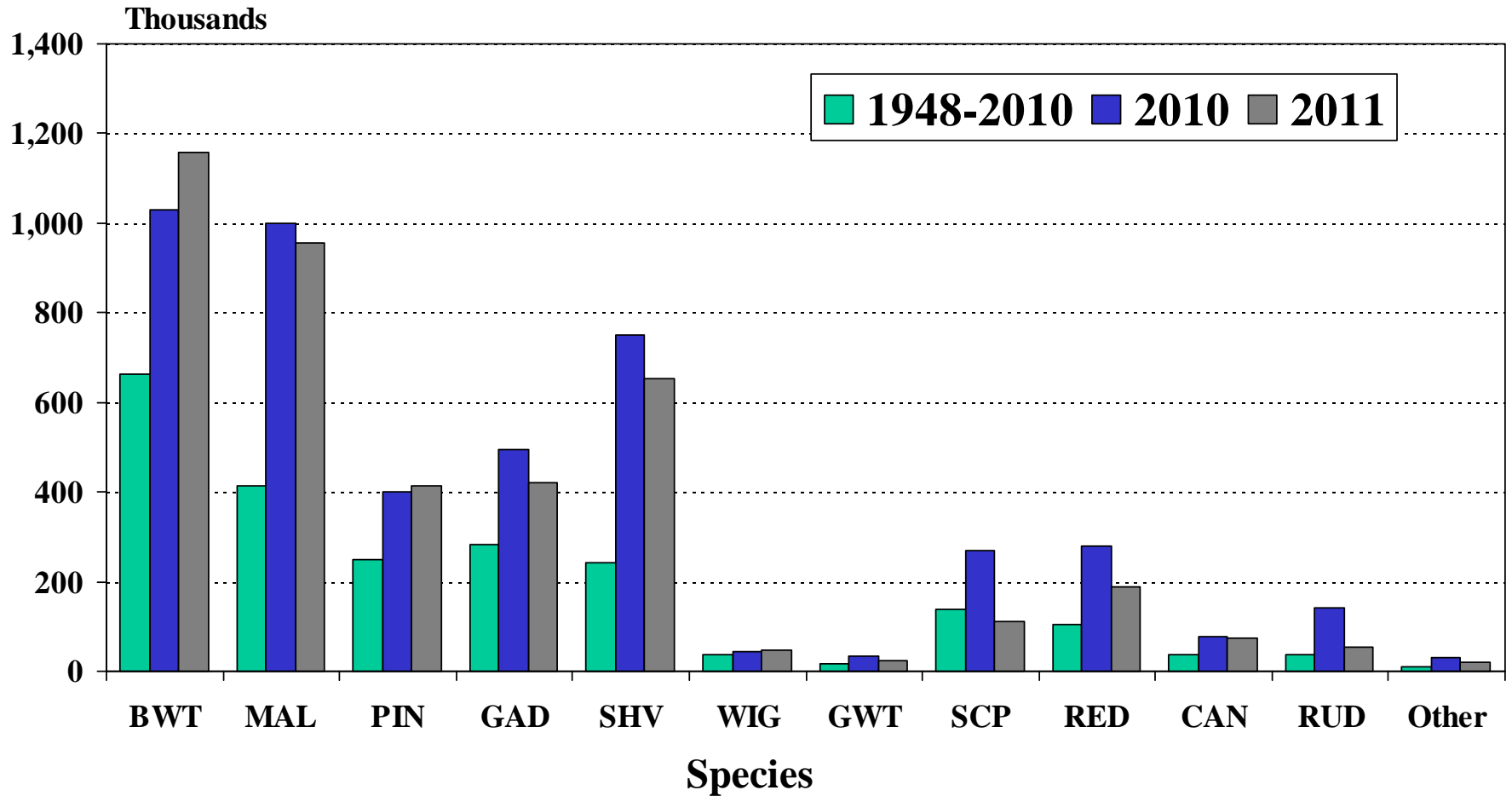
Figure 1. Location of the eight ground transects used for the Breeding Duck Survey in North Dakota.

Figure 2. Breeding duck and water indices for North Dakota, 1948-2011



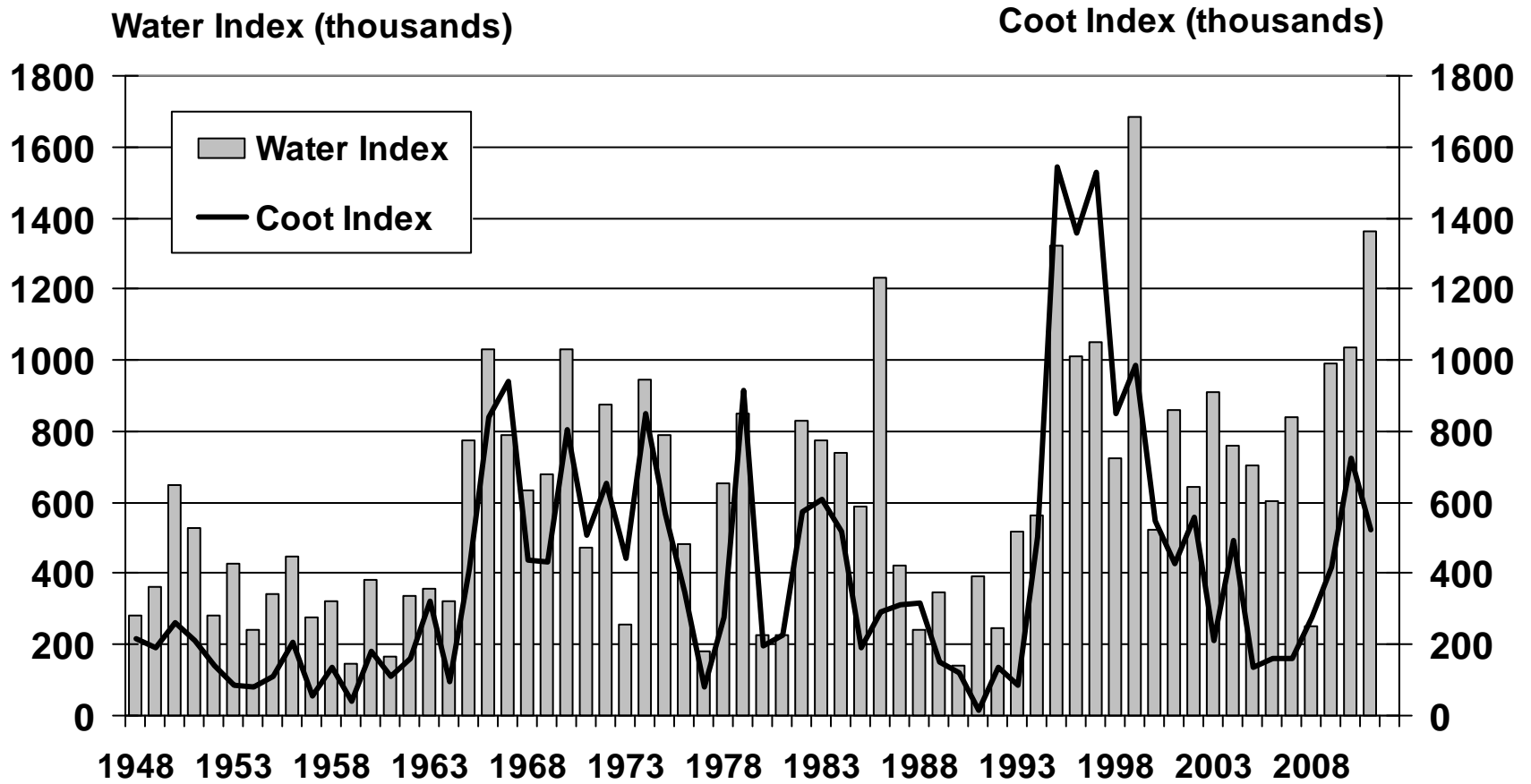
Source: NDGFD Mid-May Duck Survey
 Duckindx.ppt M. Johnson 5/11

Figure 3. Breeding duck species indices for North Dakota, 1948-2011.



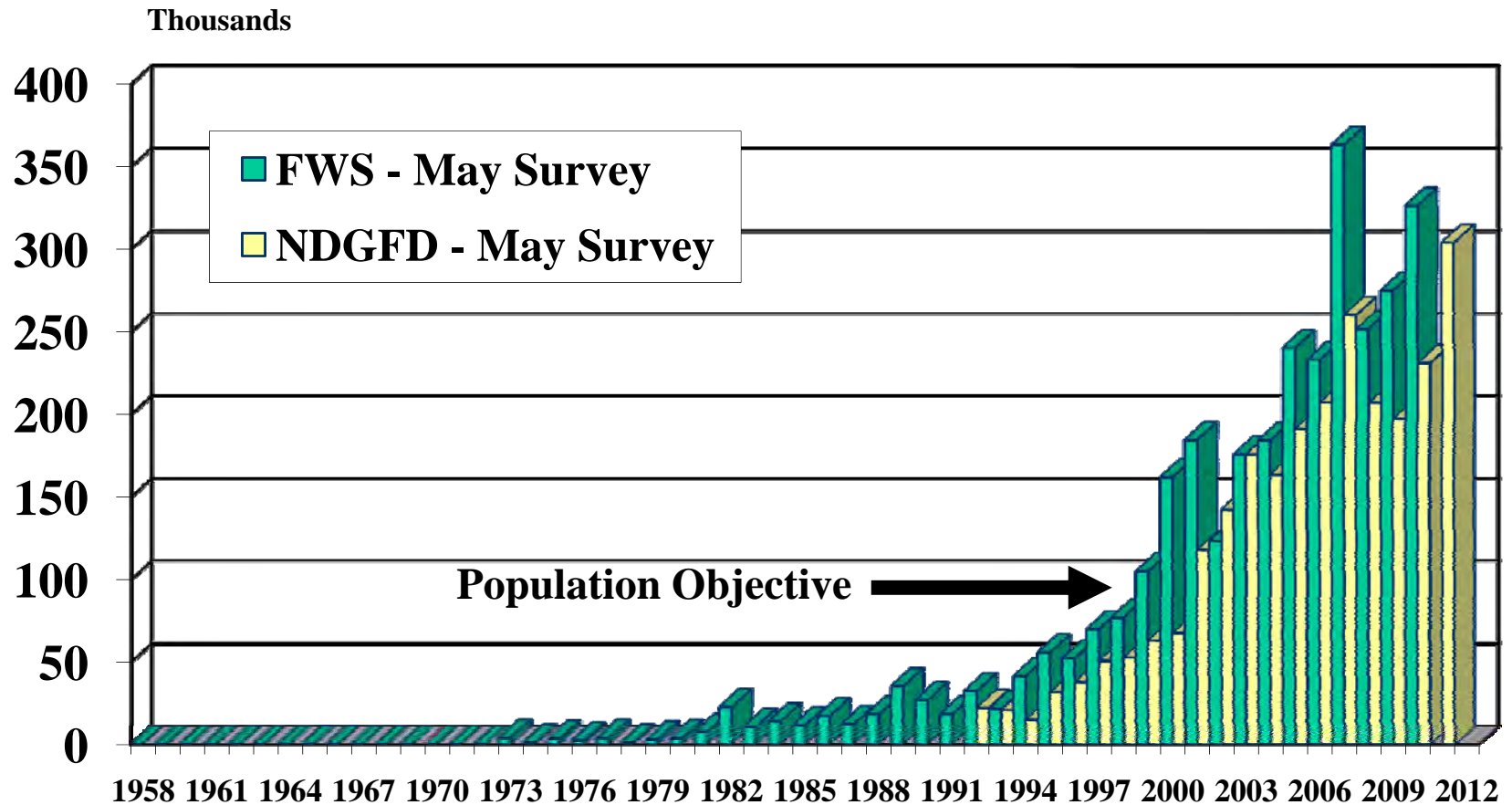
Source: NDGFD Mid-May Duck Survey
Duckindx.ppt M. Johnson 6/11

Figure 4. Coot and water indices for North Dakota, 1948-2011



Source: NDGFD Mid-May Duck Survey
Duckindx.ppt M. Johnson 6/11

North Dakota Canada Goose Population Indices



Canada Goose Population Data, North Dakota, 1958-2011.

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	251.3	-30.73%	206.55	-20.49%
2009	274.4	9.19%	197.05	-4.60%
2010	325.79	18.73%	230.67	17.06%
2011			303.67	31.65%