A Summary of the 2003 Devils Lake Wetland Management District Breeding Bird Survey

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District Breeding Bird Survey

INTRODUCTION

A Breeding Bird Survey (BBS) was conducted in the Devils Lake Wetland Management District (DLWMD) during the late spring and early summer of 2003. The DLWMD contains an interspersion of wetland, grassland and intensively cropped agricultural land, located in northeastern North Dakota. The DLWMD covers 6,493,440 acres and is comprised of eight counties: Benson, Cavalier, Grand Forks, Nelson, Pembina, Ramsey, Towner and Walsh. The objective of this study was to survey and determine temporal trends and frequency of detection of 43 targeted shorebird, waterbird and grassland bird species (Appendix A.), and obtain biological information to be used in the DLWMD's Comprehensive Conservation Plan (CCP). Also, a breeding pair map similar to a Waterfowl Breeding Pair Distribution map (aka. "Thunderstorm map") will be produced to illustrate density levels and frequencies of detection of breeding birds throughout the district.

METHODS

Two observers were hired to perform the "point count" study. Before field surveys began, each observer familiarized himself with the general landscape, transect location and potential bird species to be encountered. Audio tapes and bird books were used as aids in species identification. A specific protocol was used to standardize data collection for the BBS and was provided in part by Neal Niemuth of the Habitat and Population Evaluation Team (HAPET-USFWS) located in Bismarck, ND. Twenty transects

containing 50 point count locations at half-mile intervals were randomly chosen using Arc View software (Figure 1). One set of ten transects was considered to be in the east part of the District, while the other set was in the west. Each survey route was 25 miles in length and performed in a south to north direction stopping every ½ mile. Observers were responsible for 10 transects during the first data collection period then switched transects and collected data on the other 10 transects during the second half of the survey period. The survey period occurred from 29 May through 9 July and were performed 30 minutes before sunrise until finished, usually by 1100. Weather data were recorded in a standardized fashion and were noted at the beginning of a survey and subsequently at point locations 11, 22, 33 and 44. Weather parameters collected included: wind speed, cloud cover, precipitation or fog, and ambient temperature (Table 1).

Once underway, point location data were collected from outside the vehicle, and proceeded for a period of 3 minutes. All 43 target species seen or heard were recorded, with care taken to avoid double counting. To get a better vantage point at some locations, observers made data collections from the elevated beds of their respective vehicles. There were no attempts to coax target species into calling or flying during the survey. Once recorded, target species were assigned a numerical value and recorded on standardized data sheets. Targeted species typified by gregarious behavior such as ring-billed gulls, Franklin's gulls, black terns, American white pelicans, and double-crested cormorants were estimated when appropriate.

Once surveys were completed, data were analyzed using a variety of computer programs to obtain measures of central tendency including means, standard deviation and range. Species were categorized as A) Shorebirds, B) Waterbirds, and C) Grassland birds and abundance estimates for each were produced (Tables 2, 3, and 4). A table (Table 5) portraying frequency of occurrence was likewise generated. After this perfunctory data analysis, survey results were sent to Neal Niemuth at the HAPET office where it will be used to generate a map portraying target species density and frequency of detections.

RESULTS

A total of 10,515 breeding birds averaging 5.25 birds/point location (n = 2,000) were detected during the survey. Of the 43 target species on the list, 41 individual species were observed as a breeding pair. Only green heron and yellow rail were not seen or heard during any part of the survey. Target shorebird species detected throughout the survey period equaled an average of 11.15 per transect (n = 40, n = 10.19, Range = 0– 40), target waterbird species detected throughout the survey equaled an average of 108.65 per transect (n = 40, n = 105.34, Range = 1 – 521), and target grassland bird species averaged 146.25 per transect (n = 39, n = 74.74 , Range = 26– 322). Note: grassland bird data was not collected on the first survey at transect 2-Towner. Estimates of detectable abundance of target shorebird, waterbird and grassland bird species were calculated and presented in Tables 2,3 and 4. Individual Frequency of occurrence for the 43 target species were calculated and arranged in descending order (Table 5). Individual results by transects of shorebird, waterbird and grassland bird groups was presented in Tables 6, 7, and 8.

DISCUSSION

The BBS was originally designed as an index for waterbirds and shorebirds located in the DLWMD. However, due to lack of wetland easements in Grand Forks and Cavalier counties (Figure 2), several grassland bird species were added to the target list.

Two important considerations need to be taken into account when performing these surveys. First, the detection rates of some birds is much higher than others. For example, the sora has a very distinct call and could be heard when observers are adjacent to a wetland, even in windy conditions. On the other extreme, LeConte's sparrows were difficult to detect due to their low-pitched buzzing. Survey conditions needed to be virtually perfect to detect this species, therefore detection rates for this target species and other shy, less vociferous species may have been under represented. Secondly, timing of the migration is also significant during this survey. Some birds may not have been present or may have already passed through the region at time of survey which would likewise skew results either high or low. Even more vociferous birds drowned out or reduced detection rates of some species.

Climatic conditions such as wind or other sound distractions such as distant farm machinery or approaching vehicles were factors which reduced the detectability of certain target species. A possible solution to these problems could included a separate survey variable where surveyors make the determination regarding observation conditions at each given point location. For example; Observation condition per point could include; 4 – Excellent, 3 - Good, 2 – Fair, and 1 – Poor. This variable if collected

would allow analyzers of data the ability to tease out poorer observation conditions and focus on better, higher quality data collected during periods of good – excellent conditions. Drawing conclusions from fair - poor data may result in spurious correlations and may decrease the accuracy of the CCP.

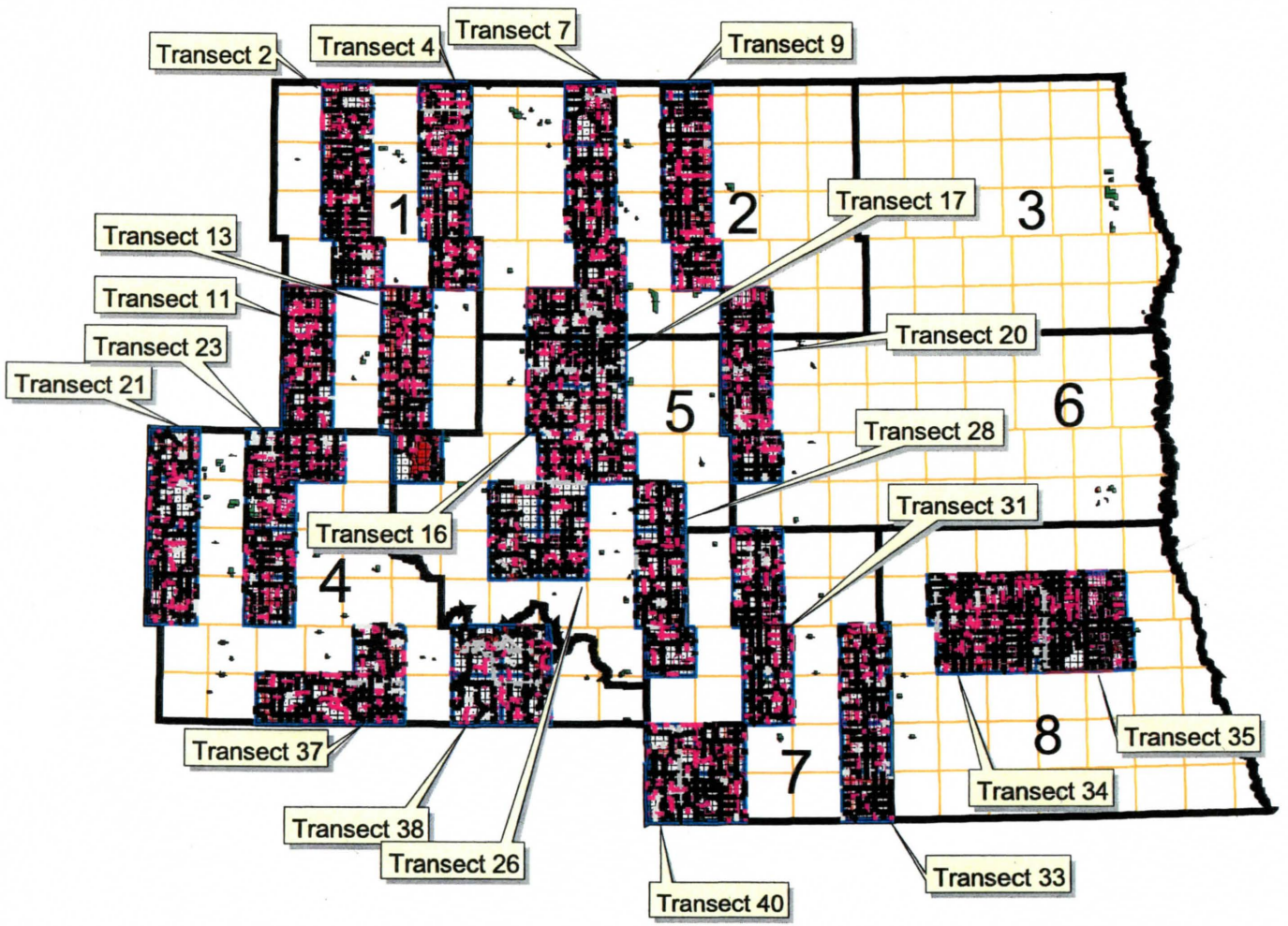
Habitat data was another parameter that could have been easily obtained by observers at point locations. One suggestion was a simple site vegetation condition where observers reported the immediate features of each point location. For example, 1 = Wetland, 2 = Cropland, and 3 = Grassland or Pasture. Modifications of these parameters could be extended to produced more detailed vegetation characteristics, but a simple site determination would be easy and could explain patterns of bird use.

Lastly, better equipment was needed to maximize the efficiency of these surveys. Higher quality binoculars than those provided could have made a difference in the number or type of birds detected. Also, an audio device (walkman or portable CD player) would have been useful in vocal detections of more difficult passerine species. Again, this type of improved equipment would have resulted in higher quality of data collected.

Despite the criticism, the survey did yield positive results and both observers enjoyed the experience to collect data and analyze a data set of this size. The size of this data base will likely increase or improve the quality of data despite the uncontrollable factors experienced with some portions of this survey. Data collected was for a good cause as

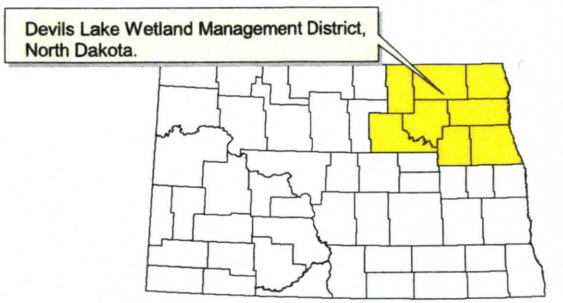
the District's CCP is an important task. Both observers enjoyed the experience gleaned from this project, and increased their personal knowledge as a result.

Figure 1. Breeding Bird Survey Routes in the Devils Lake Wetland Management District, 2003.



Legend

1 = Towner County
2 = Cavalier County
3 = Pembina County
4 = Benson County
5 = Ramsey County
6 = Walsh County
7 = Nelson County
8 = Grand Forks County



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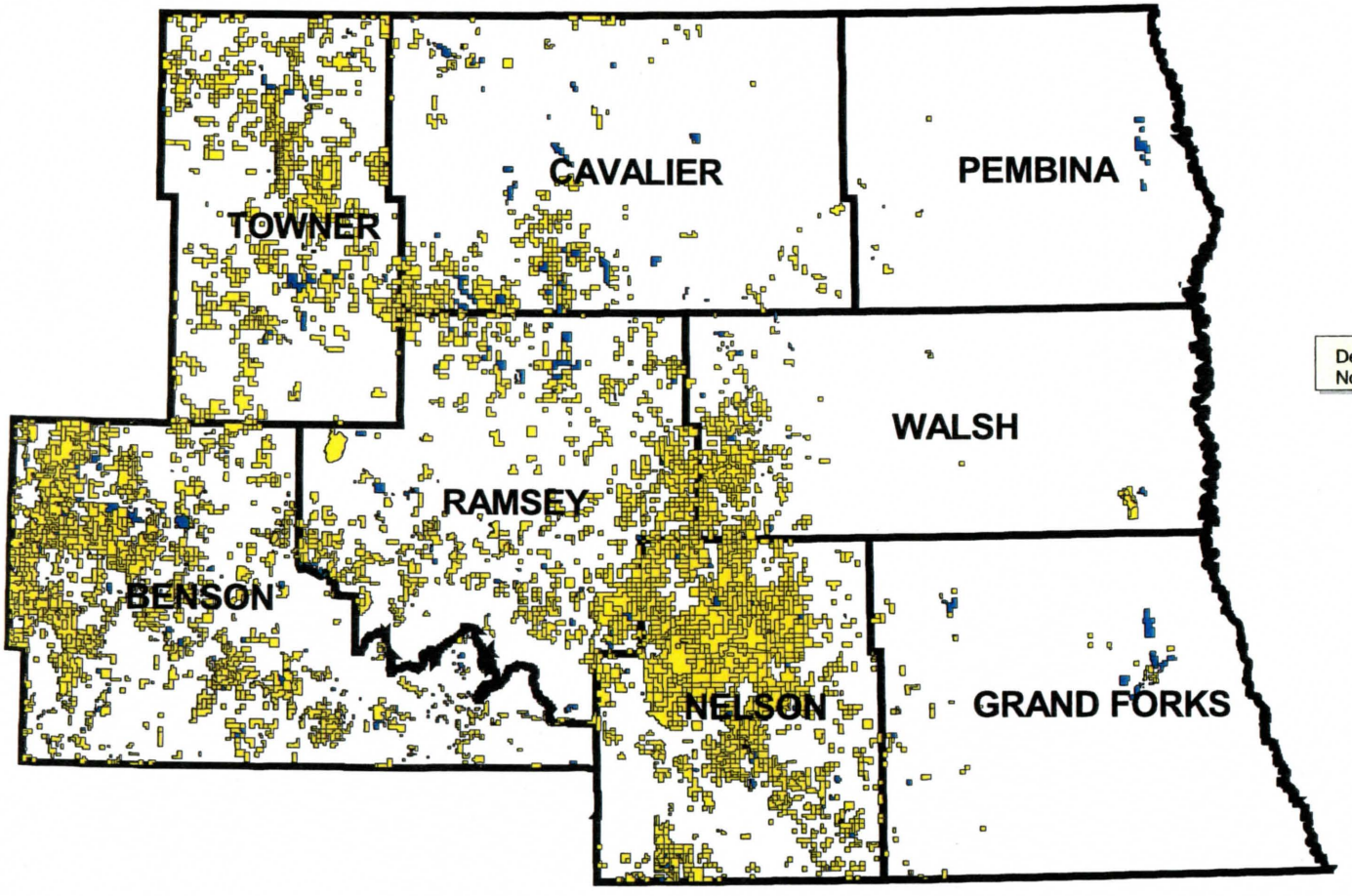
50 0 50 100 Miles

Prepared by Nicholas A. Siudyla

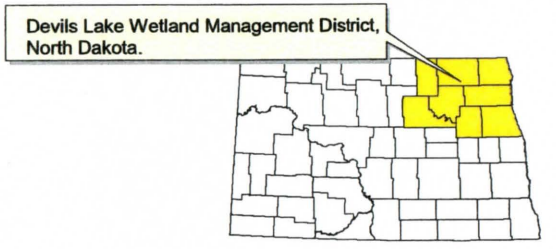
Figure 2. Wetland Easements and Waterfowl Production Areas Located in the Devils Lake Wetland Management District, 2003.



Legend

Easements

Waterfowl Production Areas



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Prepared by Nicholas A. Siudyla

Table 1. Wind speed codes listed on the data sheets during the Breeding Bird Survey in the Devils Lake Wetland Management District, 2003.

Beaufort Number	Wind Speed Indicators	Wind Speed in mph / kmph
0	Smoke rises vertically	< 1 / < 2
1	Wind direction shown by smoke drift	1-3 / 2-5
2	Wind felt on face; leaves rustle	4-7 / 6-12
3	Leaves, small twigs in constant motion; light flag extended	8-12 / 13-19
4	Raises dust and loose paper; small branches are moved	13-18 / 20-29
5	Small trees in leaf sway; crested wavelets on inland waters	19-24 / 30-38

0 - Clear or a few clouds	4 - Fog or smoke	7 - Snow
1 - Partly cloudy (scattered) or variable sky	5 - Drizzle	8 - Showers
2 - Cloudy (broken) or overcast		

Table 2. Target shorebird species perceived abundance per transect, county, and week of survey during the Breeding Bird Survey in the Devils Lake Wetland Management District, 2003.

Transect	County	Week 1-2	Week 3-4
East			
7	Cavalier	7	4
9	Cavalier	1	2
17	Ramsey	3	5
16	Ramsey	10	9
20	Walsh-Cavalier	28	20
31	Nelson	35	24
33	Nelson	16	5
34	Grand Forks	2	0
35	Grand Forks	3	1
40	Nelson	8	11
West			
2	Towner	5	5
4	Towner	3	1
11	Towner	1	16
13	Towner	4	14
21	Benson	24	11
23	Benson	29	40
26	Ramsey	7	11
28	Ramsey	16	27
37	Benson	8	11
38	Benson	12	19
Total		**222**	**230**

Table 3. Target waterbird species perceived abundance per transect, county, and week of survey during the Breeding Bird Survey in the Devils Lake Wetland Management District, 2003.

Transect	County	Week 1-2	Week 3-4
East			
7	Cavalier	67	59
9	Cavalier	25	1
17	Ramsey	165	79
16	Ramsey	186	77
20	Walsh-Cavalier	216	57
31	Nelson	333	206
33	Nelson	116	31
34	Grand Forks	68	43
35	Grand Forks	2	12
40	Nelson	83	106
West			
2	Towner	18	30
4	Towner	13	19
11	Towner	78	61
13	Towner	521	93
21	Benson	188	156
23	Benson	262	207
26	Ramsey	132	220
28	Ramsey	157	191
37	Benson	17	13
38	Benson	11	27
Total		2658	1688

Table 4. Target grassland species perceived abundance per transect, county, and week of survey during the Breeding Bird Survey in the Devils Lake Wetland Management District, 2003.

Transect	County	Week 1-2	Week 3-4
East			
7	Cavalier	43	254
9	Cavalier	70	128
17	Ramsey	42	185
16	Ramsey	21	139
20	Walsh-Cavalier	87	322
31	Nelson	44	259
33	Nelson	96	121
34	Grand Forks	109	147
35	Grand Forks	120	338
40	Nelson	128	182
West			
2	Towner	N/A	280
4	Towner	164	153
11	Towner	8	68
13	Towner	141	156
21	Benson	141	89
23	Benson	48	90
26	Ramsey	157	124
28	Ramsey	203	289
37	Benson	151	165
38	Benson	232	148
Total		2005	3712

Table 5. Frequency of occurrence / point count for an individual target species during the Breeding Bird Survey in the Devils Lake Wetland Management District, 2003.

Species	% Occurrence
Savannah Sparrow	90.2
Black Tern	75.7
Bobolink	74.8
Clay-colored Sparrow	72.6
American Coot	61.8
Grasshopper Sparrow	58.2
Marsh Wren	55.1
Vesper Sparrow	44.5
Ring Billed Gull	34.9
Franklin's Gull	27.1
Double-crested Cormorant	21.3
Sedge Wren	20.2
Baird's Sparrow	14.9
Common Snipe	14.8
Am. White Pelican	13
LeConte's Sparrow	12.8
B-C Night Heron	12.2
Wilson's Phalarope	11.3
Pied-billed Grebe	9.6
Sora	8.9
American Avocet	8.1
Western Grebe	6.2
Northern Harrier	5.7
Upland Sandpiper	5.1
Willet	4.6
American Bittern	4.3
Nelson's S-tailed Sparrow	4.3
Common Tern	4.2
Loggerheaded Shrike	3.9
Eared Grebe	2.9
Great Blue Heron	2.4
Red-necked Grebe	1.9
Ring-necked Pheasant	1.9
Marbled Godwit	1.1
Dickcissel	1
C-Collared Longspur	0.8
Least Bittern	0.8
Forster's Tern	0.4
Virginia Rail	0.4
Clark's Grebe	0.2
Horned Grebe	0.1
Green Heron	0
Yellow Rail	0

Table 6. Target shorebird species recorded during the Breeding Bird Survey in the DLWMD, 2003.

Survey Transect	Date	County	AMAV	WILL	UPSA	MAGO	COSN	WIPH	Total in Transect
Transect 2 (1)	29-May	Towner	0	3	0	1	0	1	5
Transect 2 (2)	**08-Jul**	**Towner**	**0**	**0**	**5**	**0**	**0**	**0**	**5**
Transect 4(1)	09-Jun	Towner	0	0	0	0	3	0	3
Transect 4(2)	**07-Jul**	**Towner**	**0**	**0**	**0**	**0**	**1**	**0**	**1**
Transect 7(1)	02-Jun	Cavalier	1	4	0	2	0	0	7
Transect 7(2)	**23-Jun**	**Cavalier**	**0**	**0**	**0**	**0**	**4**	**0**	**4**
Transect 9(1)	03-Jun	Cavalier	0	1	0	0	0	0	1
Transect 9(2)	**24-Jun**	**Cavalier**	**0**	**0**	**0**	**0**	**2**	**0**	**2**
Transect 11(1)	05-Jun	Towner	0	0	0	0	0	1	1
Transect 11(2)	**02-Jul**	**Towner**	**1**	**3**	**11**	**0**	**1**	**0**	**16**
Transect 13(1)	04-Jun	Towner	0	1	0	1	2	0	4
Transect 13(2)	**02-Jul**	**Towner**	**2**	**3**	**4**	**0**	**3**	**2**	**14**
Transect 16(1)	05-Jun	Ramsey	0	5	0	0	2	3	10
Transect 16(2)	**26-Jun**	**Ramsey**	**0**	**2**	**6**	**0**	**1**	**0**	**9**
Transect 17(1)	04-Jun	Ramsey	0	2	0	0	1	0	3
Transect 17(2)	**01-Jul**	**Ramsey**	**0**	**1**	**1**	**0**	**3**	**0**	**5**
Transect 20(1)	05-Jun	Walsh	10	0	0	0	12	6	28
Transect 20(2)	**03-Jul**	**Walsh**	**0**	**3**	**0**	**0**	**16**	**1**	**20**
Transect 21(1)	17-Jun	Benson	2	2	0	0	8	12	24
Transect 21(2)	**11-Jul**	**Benson**	**3**	**1**	**2**	**0**	**2**	**3**	**11**
Transect 23(1)	06-Jun	Benson	2	1	0	0	11	15	29
Transect 23(2)	**30-Jun**	**Benson**	**11**	**0**	**1**	**0**	**3**	**25**	**40**
Transect 26(1)	19-Jun	Ramsey	0	2	0	0	1	4	7
Transect 26(2)	**26-Jun**	**Ramsey**	**2**	**3**	**2**	**0**	**1**	**3**	**11**
Transect 28(1)	18-Jun	Nelson	8	0	0	0	8	0	16
Transect 28(2)	**08-Jul**	**Nelson**	**3**	**1**	**7**	**3**	**13**	**0**	**27**
Transect 31(1)	09-Jun	Nelson	19	3	1	0	8	4	35
Transect 31(2)	**02-Jul**	**Nelson**	**2**	**0**	**1**	**1**	**9**	**11**	**24**
Transect 33(1)	13-Jun	Nelson	4	4	0	0	8	0	16
Transect 33(2)	**07-Jul**	**Nelson**	**0**	**0**	**0**	**0**	**5**	**0**	**5**
Transect 34(1)	12-Jun	G.F.	1	0	0	0	1	0	2
Transect 34(2)	**02-Jul**	**G.F.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Transect 35(1)	10-Jun	G.F.	0	0	0	0	3	0	3
Transect 35(2)	**02-Jul**	**G.F.**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
Transect 37(1)	11-Jun	Benson	3	1	0	0	0	4	8
Transect 37(2)	**03-Jul**	**Benson**	**0**	**0**	**0**	**0**	**11**	**0**	**11**
Transect 38(1)	13-Jun	Benson	4	1	1	0	6	0	12
Transect 38(2)	**03-Jul**	**Benson**	**0**	**1**	**4**	**0**	**4**	**10**	**19**
Transect 40(1)	24-Jun	Nelson	0	0	1	0	1	0	2
Transect 40(2)	**03-Jul**	**Nelson**	**0**	**0**	**0**	**0**	**11**	**0**	**11**
Total Species			**78**	**48**	**48**	**8**	**165**	**105**	**452**

Table 7. Target waterbird species recorded during the Breeding Bird Survey in the DLWMD, 2003

Survey Transect	Date	County	PBGR	HOGR	RNGR	EAGR	WEGR	CLGR	AWPE	DCCO	AMBI	LEBI	GBHE	BCNH	GRHE	SORA	VIRA	YEAR	AMCO	FRGU	RBGU	COTE	COTE	BLTE	Total in trans
Transect 2 (1)	29-May	Towner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	8	0	0	0	0	9	18
Transect 2 (2)	**08-Jul**	**Towner**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**2**	**12**	**2**	**0**	**0**	**5**	**30**
Transect 4(1)	09-Jun	Towner	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	2	0	0	5	13
Transect 4(2)	**07-Jul**	**Towner**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**2**	**0**	**4**	**0**	**0**	**8**	**19**
Transect 7(1)	02-Jun	Cavalier	2	0	0	0	2	0	0	0	3	0	0	1	0	0	0	0	30	0	0	0	0	29	67
Transect 7(2)	**23-Jun**	**Cavalier**	**9**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**23**	**0**	**0**	**0**	**0**	**18**	**59**
Transect 9(1)	03-Jun	Cavalier	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	15	25
Transect 9(2)	**24-Jun**	**Cavalier**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**
Transect 11(1)	05-Jun	Towner	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	19	7	20	0	0	29	78
Transect 11(2)	**02-Jul**	**Towner**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**12**	**0**	**2**	**0**	**0**	**27**	**61**
Transect 13(1)	04-Jun	Towner	0	0	0	0	0	0	0	0	2	3	1	8	0	0	0	0	53	395	14	2	2	41	521
Transect 13(2)	**02-Jul**	**Towner**	**4**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**1**	**6**	**0**	**3**	**0**	**0**	**37**	**6**	**5**	**2**	**0**	**26**	**93**
Transect 16(1)	05-Jun	Ramsey	1	0	0	0	0	0	0	0	2	0	0	3	0	0	0	0	48	75	25	0	0	32	186
Transect 16(2)	**26-Jun**	**Ramsey**	**2**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**19**	**2**	**3**	**0**	**0**	**42**	**77**
Transect 17(1)	04-Jun	Ramsey	0	0	1	0	0	0	3	9	0	0	0	1	0	0	0	0	90	0	6	0	0	55	165
Transect 17(2)	**01-Jul**	**Ramsey**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**7**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**30**	**0**	**3**	**0**	**0**	**32**	**79**
Transect 20(1)	05-Jun	Walsh	1	0	0	4	0	0	3	0	7	0	0	5	0	0	0	0	75	0	11	0	0	110	216
Transect 20(2)	**03-Jul**	**Walsh**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**13**	**0**	**1**	**0**	**0**	**29**	**57**
Transect 21(1)	17-Jun	Benson	3	0	0	0	7	0	0	74	0	1	1	3	0	1	0	0	14	45	25	0	0	14	188
Transect 21(2)	**11-Jul**	**Benson**	**0**	**0**	**0**	**2**	**14**	**0**	**9**	**77**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**3**	**18**	**0**	**0**	**30**	**156**
Transect 23(1)	06-Jun	Benson	2	0	0	0	0	2	1	14	0	1	3	9	0	0	0	0	61	45	36	11	1	76	262
Transect 23(2)	**30-Jun**	**Benson**	**9**	**0**	**0**	**0**	**0**	**0**	**45**	**25**	**3**	**0**	**0**	**14**	**0**	**2**	**0**	**0**	**51**	**0**	**3**	**1**	**0**	**54**	**207**
Transect 26(1)	19-Jun	Ramsey	8	0	0	0	0	0	0	0	4	1	0	5	0	0	0	0	27	34	8	0	0	45	132
Transect 26(2)	**26-Jun**	**Ramsey**	**4**	**0**	**0**	**0**	**7**	**0**	**0**	**13**	**4**	**0**	**4**	**5**	**0**	**4**	**0**	**0**	**14**	**57**	**80**	**0**	**0**	**28**	**220**
Transect 28(1)	18-Jun	Nelson	6	0	0	0	0	0	22	0	3	0	6	16	0	1	0	0	20	0	9	0	0	74	157
Transect 28(2)	**08-Jul**	**Nelson**	**0**	**1**	**0**	**0**	**25**	**0**	**18**	**2**	**0**	**0**	**0**	**4**	**0**	**10**	**2**	**0**	**69**	**0**	**14**	**3**	**0**	**43**	**191**
Transect 31(1)	09-Jun	Nelson	12	0	12	15	1	0	34	59	0	1	2	22	0	0	0	0	38	0	10	6	0	121	333
Transect 31(2)	**02-Jul**	**Nelson**	**19**	**0**	**5**	**4**	**2**	**0**	**2**	**53**	**1**	**0**	**0**	**4**	**0**	**7**	**0**	**0**	**15**	**3**	**29**	**3**	**1**	**58**	**206**
Transect 33(1)	13-Jun	Nelson	0	0	0	0	0	0	3	5	4	0	0	0	0	4	0	0	33	0	15	0	0	52	116
Transect 33(2)	**07-Jul**	**Nelson**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**6**	**0**	**3**	**0**	**0**	**10**	**31**
Transect 34(1)	12-Jun	G.F.	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	12	0	2	0	0	51	68
Transect 34(2)	**02-Jul**	**G.F.**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**35**	**43**
Transect 35(1)	10-Jun	G.F.	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2
Transect 35(2)	**02-Jul**	**G.F.**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**9**	**12**
Transect 37(1)	11-Jun	Benson	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	1	0	0	4	17
Transect 37(2)	**03-Jul**	**Benson**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**13**
Transect 38(1)	13-Jun	Benson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	8	11
Transect 38(2)	**03-Jul**	**Benson**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**21**	**27**
Transect 40(1)	24-Jun	Nelson	0	0	0	0	0	0	0	8	2	0	1	2	0	1	0	0	17	0	2	0	0	50	83
Transect 40(2)	**03-Jul**	**Nelson**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**17**	**0**	**0**	**2**	**1**	**0**	**2**	**0**	**0**	**5**	**0**	**24**	**19**	**0**	**34**	**106**
Total Individuals			**96**	**1**	**19**	**29**	**60**	**2**	**157**	**372**	**40**	**8**	**24**	**115**	**0**	**89**	**4**	**0**	**881**	**687**	**378**	**47**	**4**	**1333**	**4346**

Table 8. Target grasslandbird species recorded during the Breeding Bird Survey in the DLWMD, 2003

Survey Transect	Date	County	NOHA	RNPH	SEWR	MAWR	LHSH	DICK	CCSP	BASP	VESP	SASP	GRSP	LCSP	NSSP	CCLO	BOBO	Total in Transect
Transect 2 (1)	29-May	Towner	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Transect 2 (2)	**08-Jul**	**Towner**	**3**	**0**	**2**	**2**	**0**	**0**	**63**	**0**	**56**	**65**	**47**	**0**	**0**	**0**	**42**	**280**
Transect 4(1)	09-Jun	Towner	2	1	0	0	0	0	42	11	49	40	9	6	1	0	3	164
Transect 4(2)	**07-Jul**	**Towner**	**0**	**0**	**9**	**12**	**0**	**0**	**22**	**12**	**21**	**66**	**0**	**0**	**1**	**0**	**10**	**153**
Transect 7(1)	02-Jun	Cavalier	0	0	0	0	0	0	9	0	0	10	10	2	0	0	12	43
Transect 7(2)	**23-Jun**	**Cavalier**	**0**	**1**	**17**	**69**	**0**	**0**	**49**	**0**	**10**	**70**	**10**	**1**	**8**	**0**	**19**	**254**
Transect 9(1)	03-Jun	Cavalier	1	1	0	0	0	0	2	0	4	24	16	0	0	0	22	70
Transect 9(2)	**24-Jun**	**Cavalier**	**0**	**0**	**0**	**4**	**0**	**0**	**8**	**1**	**19**	**50**	**16**	**0**	**0**	**0**	**30**	**128**
Transect 11(1)	05-Jun	Towner	1	0	0	0	2	44	0	4	12	7	1	0	0	12	0	83
Transect 11(2)	**02-Jul**	**Towner**	**1**	**0**	**0**	**1**	**0**	**0**	**23**	**2**	**0**	**12**	**3**	**0**	**0**	**0**	**26**	**68**
Transect 13(1)	04-Jun	Towner	2	0	2	1	0	0	51	0	1	22	18	4	0	0	40	141
Transect 13(2)	**02-Jul**	**Towner**	**1**	**0**	**9**	**26**	**0**	**0**	**36**	**15**	**6**	**37**	**5**	**0**	**9**	**0**	**12**	**156**
Transect 16(1)	05-Jun	Ramsey	0	0	0	3	0	0	0	0	0	13	5	0	0	0	0	21
Transect 16(2)	**26-Jun**	**Ramsey**	**0**	**0**	**5**	**52**	**0**	**0**	**16**	**6**	**14**	**25**	**4**	**0**	**3**	**0**	**14**	**139**
Transect 17(1)	04-Jun	Ramsey	1	0	0	0	0	0	1	0	0	17	12	0	0	0	11	42
Transect 17(2)	**01-Jul**	**Ramsey**	**1**	**0**	**7**	**63**	**0**	**0**	**33**	**2**	**6**	**44**	**9**	**2**	**0**	**0**	**18**	**185**
Transect 20(1)	05-Jun	Walsh	3	0	0	1	0	0	2	0	0	31	27	4	1	0	18	87
Transect 20(2)	**03-Jul**	**Walsh**	**0**	**0**	**13**	**57**	**0**	**0**	**50**	**6**	**17**	**131**	**16**	**14**	**6**	**0**	**12**	**322**
Transect 21(1)	17-Jun	Benson	1	5	1	9	0	0	53	0	16	21	8	4	0	0	23	141
Transect 21(2)	**11-Jul**	**Benson**	**5**	**0**	**0**	**0**	**0**	**0**	**16**	**1**	**1**	**19**	**17**	**0**	**0**	**0**	**30**	**89**
Transect 23(1)	06-Jun	Benson	1	1	0	0	0	0	20	1	0	8	1	0	0	0	16	48
Transect 23(2)	**30-Jun**	**Benson**	**4**	**0**	**0**	**2**	**0**	**0**	**21**	**2**	**1**	**18**	**20**	**0**	**0**	**0**	**22**	**90**
Transect 26(1)	19-Jun	Ramsey	0	0	9	50	0	0	20	0	11	40	5	0	1	0	21	157
Transect 26(2)	**26-Jun**	**Ramsey**	**2**	**0**	**0**	**7**	**0**	**0**	**27**	**0**	**0**	**20**	**27**	**3**	**0**	**0**	**38**	**124**
Transect 28(1)	18-Jun	Nelson	1	3	9	75	0	0	28	0	5	46	10	0	3	0	23	203
Transect 28(2)	**08-Jul**	**Nelson**	**1**	**0**	**26**	**85**	**3**	**1**	**34**	**15**	**6**	**50**	**38**	**18**	**2**	**6**	**4**	**289**
Transect 31(1)	09-Jun	Nelson	0	2	0	0	0	0	7	0	0	21	11	3	0	0	0	44
Transect 31(2)	**02-Jul**	**Nelson**	**0**	**0**	**16**	**115**	**0**	**0**	**24**	**7**	**5**	**49**	**16**	**11**	**5**	**0**	**11**	**259**
Transect 33(1)	13-Jun	Nelson	1	0	0	3	0	0	5	0	0	18	18	3	0	0	48	96
Transect 33(2)	**07-Jul**	**Nelson**	**0**	**0**	**8**	**34**	**0**	**0**	**15**	**1**	**13**	**32**	**4**	**1**	**0**	**0**	**13**	**121**
Transect 34(1)	12-Jun	G.F.	0	0	0	0	0	0	8	0	0	32	33	7	0	0	29	109
Transect 34(2)	**02-Jul**	**G.F.**	**1**	**0**	**11**	**9**	**0**	**0**	**48**	**2**	**51**	**5**	**0**	**0**	**0**	**0**	**20**	**147**
Transect 35(1)	10-Jun	G.F.	1	0	0	0	0	0	11	1	0	49	31	2	0	0	25	120
Transect 35(2)	**02-Jul**	**G.F.**	**1**	**2**	**37**	**8**	**3**	**2**	**71**	**27**	**7**	**60**	**53**	**24**	**2**	**0**	**41**	**338**
Transect 37(1)	11-Jun	Benson	3	0	0	0	0	0	71	1	20	26	6	2	0	0	22	151
Transect 37(2)	**03-Jul**	**Benson**	**0**	**0**	**11**	**3**	**0**	**0**	**54**	**22**	**24**	**19**	**9**	**7**	**1**	**2**	**13**	**165**
Transect 38(1)	13-Jun	Benson	1	0	2	2	0	0	51	3	27	31	36	0	0	0	79	232
Transect 38(2)	**03-Jul**	**Benson**	**2**	**0**	**0**	**1**	**0**	**0**	**41**	**0**	**17**	**22**	**11**	**0**	**0**	**0**	**54**	**148**
Transect 40(1)	24-Jun	Nelson	4	0	0	0	2	0	12	0	1	35	46	1	0	0	27	128
Transect 40(2)	**03-Jul**	**Nelson**	**1**	**1**	**15**	**39**	**0**	**0**	**75**	**0**	**23**	**7**	**8**	**2**	**0**	**0**	**11**	**182**
Total Individuals			**46**	**17**	**209**	**733**	**10**	**47**	**1119**	**142**	**443**	**1292**	**616**	**121**	**43**	**20**	**859**	**5717**

Appendix A. List of target species observed during the Breeding Bird Survey in the Devils Lake Wetland Management District, 2003.

American Avocet *(Recurvirostra americana)* AMAV
Willet *(Catoptrophorus semipalmatus)* WILL
Upland Sandpiper *(Bartramia longicauda)* UPSA
Marbled Godwit *(Limosa fedoa)* MAGO
Common Snipe *(Gallinago gallinago)* COSN
Wilson's Phalarope *(Phalaropus tricolor)* WIPH
Pied-billed Grebe *(Podilymbus podiceps)* PBGR
Horned Grebe *(Podiceps auritus)* HOGR
Red-necked Grebe *(Podiceps grisegena)* RNGR
Eared Grebe *(Podiceps nigricollis)* EAGR
Western Grebe *(Aechmophorus occidentalis)* WEGR
Clark's Grebe *(Aechmophorus clarkii)* CLGR
Am. White Pelican *(Pelecanus erythrorhynchos)* AWPE
D-C Cormorant *(Phalacrocorax auritus)* DCCO
American Bittern *(Botaurus lentiginosus)* AMBI
Least Bittern *(Ixobrychus exilis)* LEBI
Great Blue Heron *(Ardea herodias)* GBHE
B-C Night Heron *(Nycticorax nycticorax)* BCNH
Green Heron *(Butorides virescens)* GRHE
Sora *(Porzana carolina)* SORA
Virginia Rail *(Rallus limicola)* VIRA
Yellow Rail *(Coturnicops novaboracensis)* YERA
American Coot *(Fulica cristata)* AMCO
Franklin's Gull *(Larus pipixcan)* FRGU
Ring-billed Gull *(Larus delawarensis)* RBGU
Common Tern *(Sterna hirundo)* COTE
Forster's Tern *(Sterna forsteri)* FOTE
Black Tern *(Chlidonias nigra)* BLTE
Northern Harrier *(Circus cyaneus)* NOHA
Ring-necked Pheasant *(Phasianus colchicus)* RNPH
Sedge Wren *(Cistothorus platensis)* SEWR
Marsh Wren *(Cistothorus palustris)* MAWR
Loggerhead Shrike *(Lanius ludovicianus)* LHSH
Dickcissel *(Spiza americana)* DICK
Clay-colored Sparrow *(Spizella pallida)* CCSP
Baird's Sparrow *(Ammodramus bairdii)* BRSP
Vesper Sparrow *(Pooecetes gramineus)* VESP
Savannah Sparrow *(Passerculus sandwichensis)* SASP
Grasshopper Sparrow *(Ammodramus savannarum)* GRSP
LeConte's Sparrow *(Ammodramus leconteii)* LCSP
Nelson's S-tailed Sparrow *(Ammodramus nelsoni)* NSSP
C-Collared Longspur *(Calcarius ornatus)* CCLP
Bobolink *(Dolichonyx oryzivorus)* BOBO