

**Migratory shorebird, waterfowl and waterbird use  
of wetlands in the Todd Valley, Nebraska**



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The Todd Valley, Nebraska, is an abandoned ancient river valley in Saunders County, Nebraska, comprised of sand and gravel and a surface covered by Peoria Loess (Figure 1; Condra 1906, Elder et al. 1965, Wayne 1987). It is a flat to gently rolling landscape totaling approximately 40,000 hectares and within it are numerous, albeit small, embedded playa wetlands that pond water during periods of precipitation run-off (LaGrange 2005). The Todd Valley is now intensely agricultural and many of the wetlands have been drained or altered in ways that reduce their function (LaGrange 2005).

Occasionally some wetland footprints in the Todd Valley pond water and when this occurs they are used by wetland-dependent birds, especially waterfowl and shorebirds. In recent years, wetlands with ponded water have attracted birders with some regularity, especially during spring and fall migration, and these individuals have reported their observations primarily to eBird ([www.eBird.org](http://www.eBird.org)). Birders are individuals that find and identify birds, and usually report their observations to others, for recreation or pleasure. Even though concentrations and diversity of birds have been reported using the Todd Valley (see LaGrange 2005), the bird use in the region has never been summarized nor have the region's wetlands been surveyed systematically. To evaluate migratory shorebird, waterfowl and waterbird use in the Todd Valley, we 1) conducted a review of checklists submitted to eBird to determine the total number of species observed through 2018, and, 2) conducted surveys in the Todd Valley during spring 2019. Here, we summarize results from our review and survey.

## METHODS

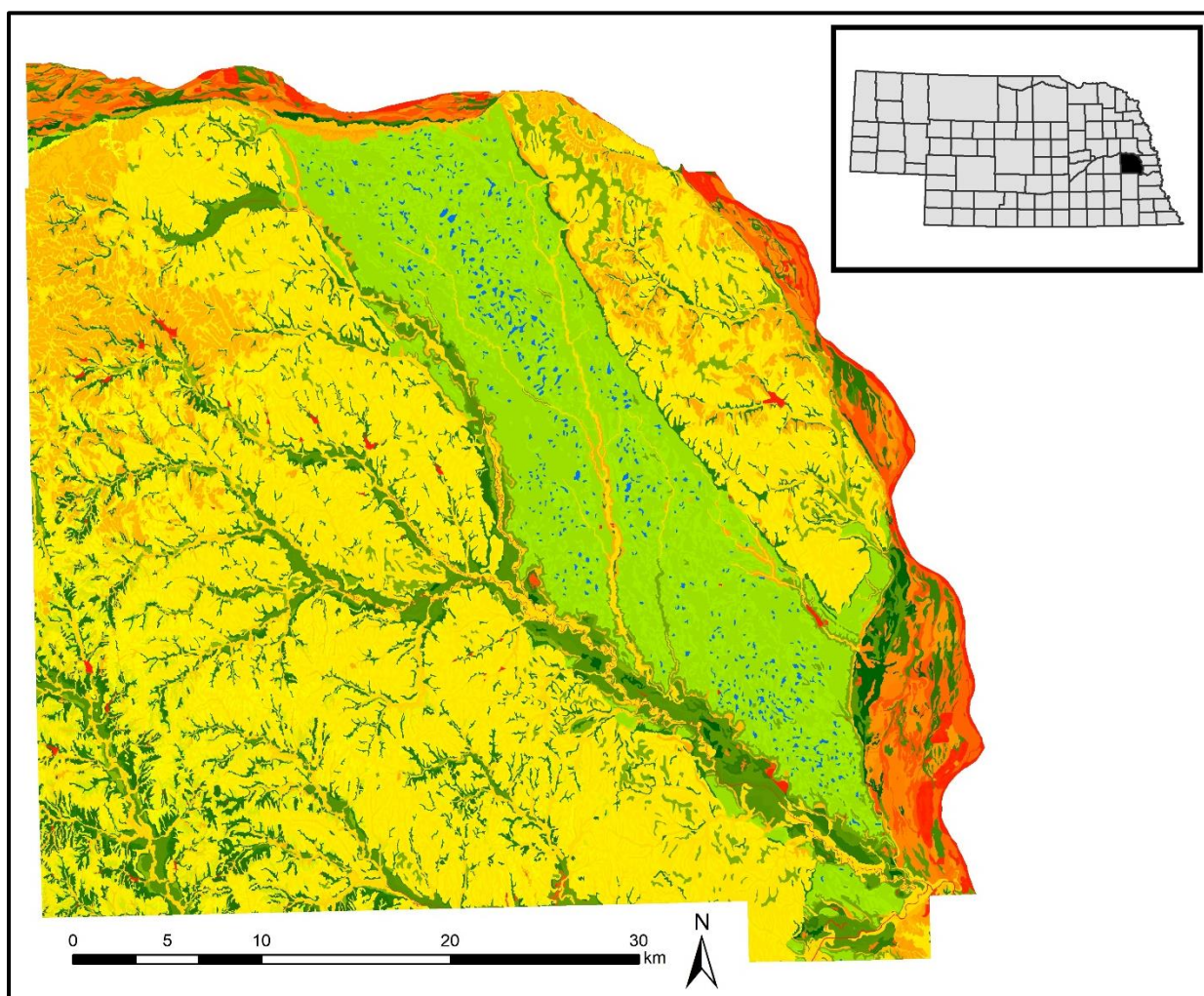
Conducting our review was straightforward. We reviewed all checklists submitted to eBird prior to 2019 to determine which species were reported at Todd Valley wetlands. We determined observations were from Todd Valley wetlands by their reported location and the descriptions of habitat provided in each checklist. We did not include observations from Lake Wanahoo and associated habitats, which we consider outside of the Todd Valley. We assembled a list of all species and summarized overall numbers.

Prior to the 2019 spring migration, the winter of 2018-19 was cold with abnormally heavy snowfall, especially during February and early March. In mid-March, rain and rapid snowmelt on frozen ground led to immense run-off that filled many wetland footprints. During the spring of 2019 we surveyed Todd Valley wetlands from late March through early May. Our focus was primarily shorebirds, but we also recorded waterfowl and other waterbirds. Since we commenced our survey in late March, we missed the early portions of waterfowl migration in mid-March.

We downloaded SSURGO soil data (USDA 2019) and imported it into ArcGIS to define our study area (Figure 1) and to identify hydric (wetland) footprints within Saunders County, Nebraska. We only used polygon data and did not include very small wetlands identified by symbols (i.e., diamonds). Our survey did not include other similar landscapes in Colfax, Platte and Dodge counties that are considered part of the Todd Valley by some authors (see LaGrange 2005). We identified hydric footprints in the Todd Valley

in Saunders County as polygons representing either Fillmore or Scott soils. We selected the following proportions of hydric soil polygons based on size: 100% of polygons > 5 ha, 80% of polygons > 3 ha < 5 ha, 50% of polygons > 2 ha and < 3 ha, 30% of polygons > 1 ha < 2 ha, and 10% of polygons < 1 ha in size. Some polygons representing hydric soils share common boundaries with other hydric soil polygons and are part of the same wetland. In these instances, if one polygon within a wetland was selected, we selected all the hydric soils (= entire wetland footprint).

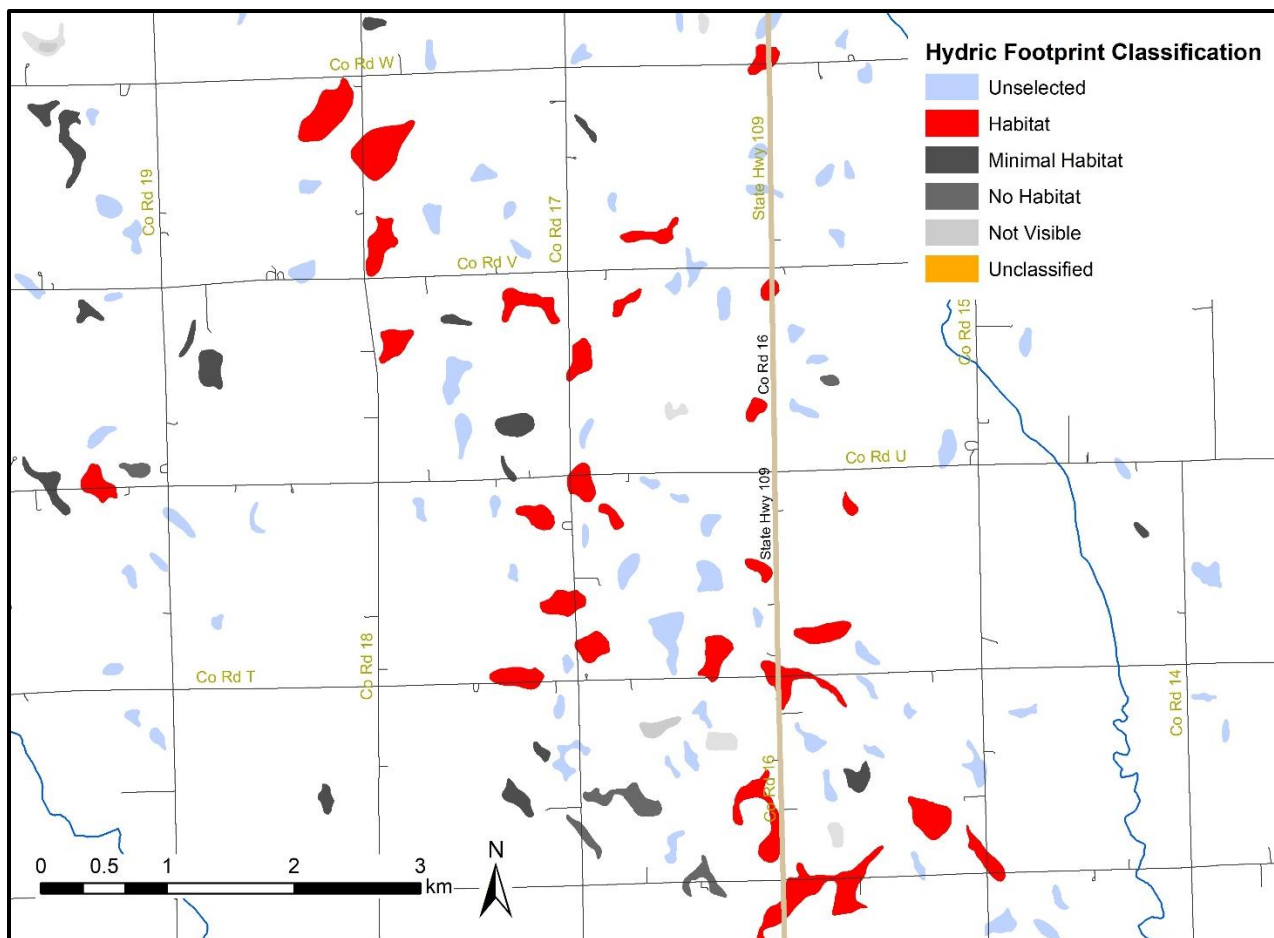
In late March, we surveyed selected wetlands to determine whether they 1) could be viewed adequately from county roads, and, 2) possessed habitat suitable for wetland-dependent birds. We classified each wetland as visible or not visible from a county road and as possessing ponded-water habitat, minimal habitat or no habitat (Figure 2). During our initial survey, we were liberal with what we considered habitat and considered those as lacking habitat as ones that were obviously drained or filled. We also recorded waterfowl, waterbird and shorebird numbers.



**Figure 1.** Soils of Saunders County, Nebraska, with the Todd Valley study area shown in light green extending from the southeastern portion of the county to the north central. Wetland footprints in the Todd Valley are shown in blue.

Following the initial survey, we refined our sample and selected only those wetlands that possessed habitat and were visible from county roads for subsequent surveys. During April through mid-May, we visited each wetland once a week and counted all waterfowl (swans, geese, and ducks), shorebirds (plovers, avocets, stilts, sandpipers and phalaropes) and other waterbirds (ibises, herons, night-herons, rails, coots, gulls and terns). We collectively refer to these birds as the focal species. We used binoculars and spotting scope from a fixed location, usually from a vehicle. However, we moved as needed to view the wetland as thoroughly as possible. We did not use flush counts, double-observer or other techniques commonly used to correct fixed location counts or to estimate detection. Even though some individual birds almost certainly went undetected, Todd Valley wetlands are small and the majority are farmed and possessed minimal crop residue during the survey. Thus, we are confident a high proportion of focal species were detected by a single observer fixed location counts. If, during a survey, a wetland was considered to no longer possess habitat, it was dropped from subsequent surveys.

We summarized data showing total numbers of species and species groups by week.



**Figure 2.** Example of wetland distribution in the study area. Wetlands were either selected (red, light gray and dark gray) or not selected (light blue) to be surveyed. Selected wetlands were classified as habitat (red), no/minimal habitat (dark gray) or not visible (light gray).

## RESULTS

We determined that 53 focal species were recorded in the Todd Valley prior to 2019 based on our review of eBird checklists (Table 1). This total included 26 waterfowl species, 24 shorebird species and 13 waterbird species.

We identified 724 polygons representing hydric soils in our study area. A sum of 170 polygons totaling 316 ha were Scott Soils and a sum of 554 polygons totaling 1064 ha were Fillmore Soils. Selected polygons represented a sum of 86 polygons totaling 200 ha of Scott Soils and 188 polygons totaling 574 ha of Fillmore Soils (Table 2). Out of the 86 selected Scott Soil polygons, 48 possessed habitat, 25 possessed no or minimal habitat and 13 were not visible from a county road during the initial survey. Out of the selected 200 ha of Scott Soils, 116 ha were considered habitat, 50 ha were considered no or minimal habitat and 34 ha were not visible from a county road (Table 3). Out of the 188 selected Fillmore Soil polygons, 48 possessed habitat, 87 possessed no or minimal habitat and 38 were not visible from a county road. Out of the selected 574 ha of Fillmore Soils, 247 ha were considered habitat, 213 ha were considered no or minimal habitat and 114 ha were not visible from a county road.

We conducted eight surveys from 26 March to 16 May. We refer to the survey conducted on 26 March as Survey 1 and the following week's survey as Survey 2 and so on. During March through mid-April, we surveyed up to 74 wetlands but during the May surveys, the number of sites we visited dropped to 39. Late March through early May was drier and virtually no wetland refilling occurred as a result of run-off from precipitation. Thus, many wetlands dried up and others were obviously artificially drained, causing the ponded water to rapidly disappear.

We recorded 53 focal species during the 2019 survey, including 20 waterfowl species, 22 shorebird species and 11 waterbird species. An additional five focal species were recorded outside of the surveys in 2019 by us or others. We recorded eight species (Tundra Swan, Common Goldeneye, Double-crested Cormorant, American White Pelican, Black-crowned Night-Heron, Virginia Rail, Sora and Piping Plover) during the 2019 survey that had not been previously reported using the Todd Valley wetlands. Overall, 68 focal species have been recorded using wetlands in the Todd Valley.

We recorded 10,514 individual birds during the 2019 survey. More waterfowl (77.3%;  $n = 8126$ ) were recorded compared to shorebirds (19.8%;  $n = 2086$ ) and waterbirds (2.6%;  $n = 276$ ). Blue-winged Teal was the most numerous species representing 31.7% ( $n = 3338$ ) of all birds counted followed by Lesser Scaup (9.4%;  $n = 992$ ), Northern Shoveler (7.7%;  $n = 810$ ) and Green-winged Teal (6.5%;  $n = 688$ ; Table 4). In addition to migratory waterfowl, we also recorded a nesting pair of Canada Geese at a small wetland. The nesting attempt failed, however.

Franklin's Gull was the most numerous waterbird representing 50.7% ( $n = 140$ ) of all waterbirds followed by American Coot (26.0%,  $n = 72$ ), American White Pelican (9.1%;  $n = 25$ ), and Pied-billed Grebe (7.2%,  $n = 20$ ; Table 6). Pectoral Sandpiper was the most numerous shorebird representing 19.3% ( $n = 403$ ) of all shorebirds, followed by Lesser Yellowlegs (18.9%;  $n = 395$ ), Killdeer (11.2%;  $n = 234$ ) and American Golden-Plover (8.1%,  $n = 170$ ; Table 7).

**Table 1.** Waterfowl, waterbird and shorebird species recorded in the Todd Valley wetland complex prior to 2019 (based on eBird data) and during spring 2019. All species recorded during spring 2019 were done so during the eight formal surveys unless marked with an “o”. This symbol indicate species recorded outside of surveys.

| Species                     | Recorded prior to 2019 | Recorded during Spring 2019 |
|-----------------------------|------------------------|-----------------------------|
| Snow Goose                  |                        | x                           |
| Ross's Goose                | x                      |                             |
| Greater White-fronted Goose | x                      | o                           |
| Cackling Goose              |                        | o                           |
| Canada Goose                | x                      | x                           |
| Trumpeter Swan              | x                      |                             |
| Tundra Swan                 |                        | x                           |
| Wood Duck                   | x                      | x                           |
| Blue-winged Teal            | x                      | x                           |
| Cinnamon Teal               | x                      | x                           |
| Northern Shoveler           | x                      | x                           |
| Gadwall                     | x                      | x                           |
| American Wigeon             | x                      | x                           |
| Mallard                     | x                      | x                           |
| Northern Pintail            | x                      | x                           |
| Green-winged Teal           | x                      | x                           |
| Canvasback                  | x                      | x                           |
| Redhead                     | x                      | x                           |
| Ring-necked Duck            | x                      | x                           |
| Greater Scaup               |                        | o                           |
| Lesser Scaup                | x                      | x                           |
| Common Goldeneye            |                        | x                           |
| Bufflehead                  | x                      | x                           |
| Hooded Merganser            | x                      | x                           |
| Common Merganser            | x                      |                             |
| Ruddy Duck                  | x                      | x                           |
| Pied-billed Grebe           | x                      | x                           |
| Double-crested Cormorant    |                        | x                           |
| American White Pelican      |                        | x                           |
| Great Blue Heron            | x                      | x                           |
| Great Egret                 | x                      |                             |
| Snowy Egret                 | x                      |                             |
| Cattle Egret                | x                      | x                           |
| Black-crowned Night-Heron   |                        | x                           |
| Virginia Rail               |                        | x                           |
| Sora                        |                        | x                           |
| American Coot               | x                      | x                           |



**Table 1** (con't).

| Species                 | Recorded prior to 2019 | Recorded during Spring 2019* |
|-------------------------|------------------------|------------------------------|
| Black-bellied Plover    | X                      |                              |
| American Golden-Plover  | X                      | X                            |
| Semipalmated Plover     | X                      | X                            |
| Piping Plover           |                        | X                            |
| Killdeer                | X                      | X                            |
| American Avocet         | X                      | X                            |
| Spotted Sandpiper       | X                      | X                            |
| Solitary Sandpiper      | X                      | X                            |
| Greater Yellowlegs      | X                      | X                            |
| Lesser Yellowlegs       | X                      | X                            |
| Willet                  |                        | X                            |
| Upland Sandpiper        | X                      | X                            |
| Hudsonian Godwit        | X                      | X                            |
| Marbled Godwit          | X                      |                              |
| Sanderling              | X                      | O                            |
| Semipalmated Sandpiper  | X                      | X                            |
| Least Sandpiper         | X                      | X                            |
| White-rumped Sandpiper  | X                      | X                            |
| Baird's Sandpiper       | X                      | X                            |
| Pectoral Sandpiper      | X                      | X                            |
| Dunlin                  | X                      | X                            |
| Stilt Sandpiper         | X                      | X                            |
| Buff-breasted Sandpiper | X                      |                              |
| Short-billed Dowitcher  | X                      | O                            |
| Long-billed Dowitcher   | X                      | X                            |
| Wilson's Snipe          | X                      | X                            |
| Wilson's Phalarope      | X                      | X                            |
| Franklin's Gull         | X                      | X                            |
| Ring-billed Gull        |                        | X                            |
| Black Tern              | X                      |                              |

**Table 2.** Summary of the number of hydric soil polygons in the Todd Valley study area.

| Polygon (soil type)    | Total | Selected | Habitat | No/Minimal habitat | Not visible |
|------------------------|-------|----------|---------|--------------------|-------------|
| <b><u>Fillmore</u></b> |       |          |         |                    |             |
| Number                 | 554   | 188      | 63      | 87                 | 38          |
| % of total             |       | 34%      | 11%     | 16%                | 7%          |
| % of total selected    |       |          | 34%     | 46%                | 20%         |
| <b><u>Scott</u></b>    |       |          |         |                    |             |
| Number                 | 170   | 86       | 48      | 25                 | 13          |
| % of total             |       | 51%      | 28%     | 15%                | 8%          |
| % of total selected    |       |          | 56%     | 29%                | 15%         |
| <b><u>Total</u></b>    |       |          |         |                    |             |
| Number                 | 724   | 274      | 111     | 112                | 51          |
| % of total             |       | 38%      | 15%     | 15%                | 7%          |
| % of total selected    |       |          | 41%     | 41%                | 19%         |





**Table 3.** Summary of areal coverage in hectares of hydric soil polygons in the Todd Valley study area.

| Polygon (soil type)    | Total | Selected | Habitat | No/Minimal habitat | Not visible |
|------------------------|-------|----------|---------|--------------------|-------------|
| <b><u>Fillmore</u></b> |       |          |         |                    |             |
| Number of hectares     | 1,064 | 574      | 247     | 213                | 114         |
| % of total             |       | 54%      | 23%     | 20%                | 11%         |
| % of total selected    |       |          | 43%     | 37%                | 20%         |
| <b><u>Scott</u></b>    |       |          |         |                    |             |
| Number of hectares     | 316   | 200      | 116     | 50                 | 34          |
| % of total             |       | 63%      | 37%     | 16%                | 11%         |
| % of total selected    |       |          | 58%     | 25%                | 17%         |
| <b><u>Total</u></b>    |       |          |         |                    |             |
| Number of hectares     | 1,380 | 774      | 363     | 263                | 148         |
| % of total             |       | 56%      | 26%     | 19%                | 11%         |
| % of total selected    |       |          | 47%     | 34%                | 19%         |



**Table 4.** Total number of waterfowl recorded during the 2019 Todd Valley survey.

| Species                | S1*         | S2          | S3         | S4          | S5          | S6         | S7         | S8        | Total       |
|------------------------|-------------|-------------|------------|-------------|-------------|------------|------------|-----------|-------------|
| Snow Goose             | 1           |             |            |             |             |            |            |           |             |
| Canada Goose           | 9           | 8           | 7          | 6           | 7           | 5          | 4          |           | 46          |
| Tundra Swan            | 2           |             |            |             |             |            |            |           | 2           |
| Wood Duck              | 8           | 2           | 2          | 1           |             | 1          |            |           | 14          |
| Blue-winged Teal       | 21          | 103         | 269        | 1276        | 912         | 603        | 119        | 35        | 3338        |
| Cinnamon Teal          |             |             |            | 1           |             |            |            |           | 1           |
| Northern Shoveler      | 294         | 222         | 85         | 159         | 28          | 13         | 4          | 5         | 810         |
| Gadwall                | 379         | 140         | 39         | 81          | 9           | 6          |            |           | 654         |
| American Wigeon        | 86          | 59          | 25         | 17          | 8           |            |            |           | 195         |
| Mallard                | 290         | 130         | 39         | 60          | 24          | 36         |            | 5         | 584         |
| Northern Pintail       | 26          | 10          |            |             |             |            |            |           | 36          |
| Green-winged Teal      | 234         | 163         | 98         | 152         | 27          | 14         |            |           | 688         |
| Canvasback             | 102         | 9           | 1          |             |             |            |            |           | 112         |
| Redhead                | 52          | 8           | 8          | 20          | 1           |            |            | 2         | 91          |
| Ring-necked Duck       | 166         | 24          | 78         | 185         | 18          |            |            |           | 471         |
| Lesser Scaup           | 255         | 325         | 224        | 158         | 30          |            |            |           | 992         |
| Common Goldeneye       | 29          | 2           |            |             |             |            |            |           | 31          |
| Bufflehead             | 9           | 9           | 12         | 3           |             |            |            |           | 33          |
| Hooded Merganser       | 2           |             |            | 6           |             |            |            |           | 8           |
| Ruddy Duck             | 20          | 16          | 6          | 2           | 1           |            |            |           | 45          |
| Duck spp.              | 10          |             |            |             | 50          |            |            |           | 60          |
| <b>Total waterfowl</b> | <b>1995</b> | <b>1230</b> | <b>893</b> | <b>2127</b> | <b>1065</b> | <b>678</b> | <b>127</b> | <b>47</b> | <b>8162</b> |

\*S1 = 26 March, S2 = 2 April, S3 = 9 April, S4 = 16 April, S5 = 23 April, S6 = 30 April, S7 = 6 May, S8 = 13 May

**Table 5.** Total number of waterbirds recorded during the 2019 Todd Valley survey.

| Species                   | S1*      | S2        | S3        | S4        | S5         | S6       | S7       | S8       | Total      |
|---------------------------|----------|-----------|-----------|-----------|------------|----------|----------|----------|------------|
| Pied-billed Grebe         |          |           | 3         | 11        | 4          | 2        |          |          | 20         |
| Double-crested Cormorant  |          |           |           |           | 1          |          |          |          | 1          |
| American White Pelican    |          |           | 25        |           |            |          |          |          | 25         |
| Great Blue Heron          |          |           | 1         | 2         | 2          | 2        |          |          | 7          |
| Cattle Egret              |          |           |           | 1         |            |          |          |          | 1          |
| Black-crowned Night-Heron |          |           |           |           |            |          |          | 1        | 1          |
| Virginia Rail             |          |           |           |           |            |          | 2        |          | 2          |
| Sora                      |          |           |           |           | 1          |          | 2        |          | 3          |
| American Coot             | 1        | 27        | 18        | 23        | 2          | 1        |          |          | 72         |
| Franklin's Gull           |          |           |           | 35        | 105        |          |          |          | 140        |
| Ring-billed Gull          | 3        | 1         |           |           |            |          |          |          | 4          |
| <b>Total waterbirds</b>   | <b>4</b> | <b>28</b> | <b>47</b> | <b>72</b> | <b>115</b> | <b>5</b> | <b>4</b> | <b>1</b> | <b>276</b> |

\*S1 = 26 March, S2 = 2 April, S3 = 9 April, S4 = 16 April, S5 = 23 April, S6 = 30 April, S7 = 6 May, S8 = 13 May

**Table 6.** Total number of shorebirds recorded during the 2019 Todd Valley survey.

| Species                 | S1*       | S2        | S3         | S4         | S5         | S6        | S7         | S8        | Total       |
|-------------------------|-----------|-----------|------------|------------|------------|-----------|------------|-----------|-------------|
| American Golden-Plover  |           |           | 20         | 147        | 3          |           |            |           | 170         |
| Semipalmated Plover     |           |           |            |            | 4          | 11        | 25         |           | 40          |
| Piping Plover           |           |           |            |            | 1          |           |            |           | 1           |
| Killdeer                | 46        | 53        | 50         | 30         | 20         | 18        | 4          | 13        | 234         |
| American Avocet         |           |           |            |            | 4          |           |            |           | 4           |
| Spotted Sandpiper       |           |           |            |            |            | 1         | 10         | 4         | 15          |
| Solitary Sandpiper      |           |           |            |            |            | 1         |            |           | 1           |
| Greater Yellowlegs      | 3         | 20        | 45         | 12         | 1          | 11        |            |           | 92          |
| Lesser Yellowlegs       |           |           | 15         | 83         | 115        | 34        | 129        | 19        | 395         |
| Willet                  |           |           |            |            |            | 1         |            |           | 1           |
| Upland Sandpiper        |           |           |            |            |            | 1         | 1          |           | 2           |
| Hudsonian Godwit        |           |           |            | 45         |            | 5         |            |           | 50          |
| Semipalmated Sandpiper  |           |           |            |            |            | 4         | 48         | 12        | 64          |
| Least Sandpiper         |           |           |            |            |            |           | 30         | 1         | 31          |
| White-rumped Sandpiper  |           |           |            |            |            | 3         | 98         | 15        | 116         |
| Baird's Sandpiper       |           |           | 10         | 27         | 49         | 53        | 8          |           | 147         |
| Pectoral Sandpiper      |           |           | 17         | 89         | 57         | 40        | 174        | 26        | 403         |
| Dunlin                  |           |           |            |            | 5          |           | 1          |           | 6           |
| Stilt Sandpiper         |           |           |            |            |            |           |            | 1         | 1           |
| Long-billed Dowitcher   |           | 5         |            |            | 1          | 35        | 10         |           | 51          |
| Wilson's Snipe          |           |           | 5          | 101        | 3          |           |            |           | 109         |
| Wilson's Phalarope      |           |           |            |            | 1          | 140       | 5          | 7         | 153         |
| <b>Total shorebirds</b> | <b>49</b> | <b>73</b> | <b>130</b> | <b>317</b> | <b>148</b> | <b>83</b> | <b>169</b> | <b>36</b> | <b>2086</b> |

\*S1 = 26 March, S2 = 2 April, S3 = 9 April, S4 = 16 April, S5 = 23 April, S6 = 30 April, S7 = 6 May, S8 = 13 May



Lesser Yellowlegs at a Todd Valley wetland 16 April 2019. Photo by Stephen Brenner.



## DISCUSSION

The Todd Valley is a relatively small landscape in Nebraska. The wetlands that presently have some remaining function are also relatively minor when compared to those in other landscapes such as the Sandhills and Rainwater Basin. Nevertheless, these wetlands are used by migratory waterfowl, shorebirds and waterbirds primarily during migration and in relatively small numbers. Until this survey and report, bird use at wetlands in the Todd Valley had never been formally studied or summarized.

Our review of eBird reports and the formal survey in spring 2019 showed fair numbers and a respectable diversity of species use wetlands in the Todd Valley. Our motivation to conduct the survey was focused on shorebird use, but we were surprised that waterfowl comprised the overwhelming majority of birds recorded and that shorebird use was minimal. Shorebird use in the region seemed to be low compared to previous springs (JGJ, personal observation) and overall lower numbers of shorebirds were observed throughout eastern Nebraska compared to other years (JGJ, personal observation). Conditions in the winter of 2018-19 that resulted in ponded water at many Todd Valley wetlands may have also created an abundance of habitat throughout the region and thus shorebirds may have been less concentrated than in other years.

American Golden-Plover was one shorebird species recorded in moderate numbers. This species is a common spring migrant in the eastern portion of the Rainwater Basin (Jorgensen 2012), a landscape that is similar (i.e., relatively flat with embedded wetlands) to the Todd Valley. Prior to 2019, American Golden-Plovers were observed with some regularity in the Todd Valley, with as many as 305 recorded at a single wetland (see <https://ebird.org/view/checklist/S35813733>). In addition, as many as 400 have been reported at the upper end of Lake Wanahoo, which lies along the western edge of the region, in recent years. We suspect that American Golden-Plovers have always been regular migrants in the Todd Valley and have regularly used agricultural fields and wetlands, just as this species does in the Rainwater Basin. We also suspect that American Golden-Plovers have increasingly used the upper end of Lake Wanahoo since it was formed in 2012, especially in recent years when the lake level has been lowered in spring to hold more run-off from storms.

Among waterfowl, our observations conformed with our expectations that dabbling ducks would be the most commonly encountered species and that Blue-winged Teal would be the most numerous. However, the abundance of Lesser Scaup, Ring-necked Duck, Canvasback and Redhead exceeded our expectations. Furthermore, we did not anticipate observing Tundra Swans or Common Goldeneyes using the relatively small wetlands in the Todd Valley. If we had commenced our surveys earlier in the season, we likely would have also recorded moderate numbers of geese since 300 Snow Geese, 200 Greater White-fronted Geese and 500 Canada Geese were observed at a wetland on 20 March by another observer (see <https://ebird.org/view/checklist/S54041653>).

Wetlands in the Todd Valley provide habitat for migratory waterfowl, shorebirds and waterbirds. Habitat in this landscape could be improved through proactive conservation efforts that protect wetlands and enhance their function through restoration. Since the wetlands exist solely on private agricultural lands, any conservation efforts would need to be done in a manner that is compatible with producers. However, conservation planners and practitioners would need to evaluate trade-offs of directing resources to wetlands in the Todd Valley and possibly away from other areas to determine whether the biological return on investments are comparable. It is possible with changes in precipitation patterns associated

with a changing climate, and specifically with increases in overall and short-term precipitation events, that wetlands in the Todd Valley may pond water more frequently. If this occurs, bird use in the region may increase in the future.

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Ducks and a Canada Goose at a Todd Valley wetland on 23 April 2019. The Canada Goose nest found during the survey is located in the bottom right-hand corner of the photo.

**Appendix A.** Common and scientific names of species mentioned in this report.

| Common Name                 | Scientific Name                |
|-----------------------------|--------------------------------|
| Snow Goose                  | <i>Anser caerulescens</i>      |
| Ross's Goose                | <i>Anser rossii</i>            |
| Greater White-fronted Goose | <i>Anser albifrons</i>         |
| Cackling Goose              | <i>Branta hutchinsii</i>       |
| Canada Goose                | <i>Branta canadensis</i>       |
| Trumpeter Swan              | <i>Cygnus buccinator</i>       |
| Tundra Swan                 | <i>Cygnus columbianus</i>      |
| Wood Duck                   | <i>Aix sponsa</i>              |
| Blue-winged Teal            | <i>Spatula discors</i>         |
| Cinnamon Teal               | <i>Spatula cyanoptera</i>      |
| Northern Shoveler           | <i>Spatula clypeata</i>        |
| Gadwall                     | <i>Mareca strepera</i>         |
| American Wigeon             | <i>Mareca americana</i>        |
| Mallard                     | <i>Anas platyrhynchos</i>      |
| Northern Pintail            | <i>Anas acuta</i>              |
| Green-winged Teal           | <i>Anas crecca</i>             |
| Canvasback                  | <i>Aythya valisineria</i>      |
| Redhead                     | <i>Aythya americana</i>        |
| Ring-necked Duck            | <i>Aythya collaris</i>         |
| Greater Scaup               | <i>Aythya marila</i>           |
| Lesser Scaup                | <i>Aythya affinis</i>          |
| Bufflehead                  | <i>Bucephala albeola</i>       |
| Common Goldeneye            | <i>Bucephala clangula</i>      |
| Hooded Merganser            | <i>Lophodytes cucullatus</i>   |
| Common Merganser            | <i>Mergus merganser</i>        |
| Ruddy Duck                  | <i>Oxyura jamaicensis</i>      |
| Pied-billed Grebe           | <i>Podilymbus podiceps</i>     |
| Eared Grebe                 | <i>Podiceps nigricollis</i>    |
| Virginia Rail               | <i>Rallus limicola</i>         |
| Sora                        | <i>Porzana carolina</i>        |
| American Coot               | <i>Fulica americana</i>        |
| Sandhill Crane              | <i>Antigone canadensis</i>     |
| Black-necked Stilt          | <i>Himantopus mexicanus</i>    |
| American Avocet             | <i>Recurvirostra americana</i> |
| Black-bellied Plover        | <i>Pluvialis squatarola</i>    |
| American Golden-Plover      | <i>Pluvialis dominica</i>      |
| Semipalmated Plover         | <i>Charadrius semipalmatus</i> |
| Piping Plover               | <i>Charadrius melodus</i>      |
| Killdeer                    | <i>Charadrius vociferus</i>    |



## Appendix A (cont'd)

| Common Name               | Scientific Name                  |
|---------------------------|----------------------------------|
| Upland Sandpiper          | <i>Bartramia longicauda</i>      |
| Hudsonian Godwit          | <i>Limosa haemastica</i>         |
| Marbled Godwit            | <i>Limosa fedoa</i>              |
| Stilt Sandpiper           | <i>Calidris himantopus</i>       |
| Sanderling                | <i>Calidris alba</i>             |
| Dunlin                    | <i>Calidris alpina</i>           |
| Baird's Sandpiper         | <i>Calidris bairdii</i>          |
| Least Sandpiper           | <i>Calidris minutilla</i>        |
| White-rumped Sandpiper    | <i>Calidris fuscicollis</i>      |
| Buff-breasted Sandpiper   | <i>Calidris subruficollis</i>    |
| Pectoral Sandpiper        | <i>Calidris melanotos</i>        |
| Semipalmated Sandpiper    | <i>Calidris pusilla</i>          |
| Short-billed Dowitcher    | <i>Limnodromus griseus</i>       |
| Long-billed Dowitcher     | <i>Limnodromus scolopaceus</i>   |
| Wilson's Snipe            | <i>Gallinago delicata</i>        |
| Spotted Sandpiper         | <i>Actitis macularius</i>        |
| Solitary Sandpiper        | <i>Tringa solitaria</i>          |
| Lesser Yellowlegs         | <i>Tringa flavipes</i>           |
| Willet                    | <i>Tringa semipalmata</i>        |
| Greater Yellowlegs        | <i>Tringa melanoleuca</i>        |
| Wilson's Phalarope        | <i>Phalaropus tricolor</i>       |
| Franklin's Gull           | <i>Leucophaeus pipixcan</i>      |
| Ring-billed Gull          | <i>Larus delawarensis</i>        |
| Black Tern                | <i>Chlidonias niger</i>          |
| Double-crested Cormorant  | <i>Phalacrocorax auritus</i>     |
| American White Pelican    | <i>Pelecanus erythrorhynchos</i> |
| Great Blue Heron          | <i>Ardea herodias</i>            |
| Great Egret               | <i>Ardea alba</i>                |
| Snowy Egret               | <i>Egretta thula</i>             |
| Cattle Egret              | <i>Bubulcus ibis</i>             |
| Black-crowned Night-Heron | <i>Nycticorax nycticorax</i>     |
| White-faced Ibis          | <i>Plegadis chihi</i>            |