



Ensuring a future for North America's Cranes

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Species Detection Report

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A summary of
the Crane Trust
permitted
activities

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Introduction

During the summer of 2015 we implemented a long-term monitoring plot layout through set transects establishing survey lines in all parts of the Crane Trust properties with differing soil, vegetation, management practices, and land use histories. These plots consist of two parallel transects; the vegetation line, totaling 100m and the bird and small mammal line, totaling 200m. Due to the complex mosaic of soil types and management histories on the property the number of monitoring sites totaled 58, after adding another 2 on our Dippel property in 2016. We have continued our efforts to survey the vegetation, avian community, small mammals, and butterfly species at these sites utilizing standardized methodologies on a set rotation to monitor the effectiveness of our management techniques in managing for native biodiversity. Additionally, we conducted surveys of native and exotic slough dwelling fish and monitored ground water levels.

As of November 7th, 2016 the Crane Trust field team performed 97 avian surveys across 58 monitoring sites, 30 small mammal surveys totaling 1500 trap nights (trap number x nights set), 25 vegetation surveys, 5 days of fish seining, and 20 butterfly surveys. Below is a summary of the detections and methods for avian, vegetation, and small mammal surveys. In addition, incidental detections (seen/collected outside of actual surveys) of vegetation, butterflies, and other animals are listed.

Small Mammals

We used Sherman Box Traps baited with a seed mixture of sterilized (autoclaved) oats, sunflower seeds, and cracked corn. Mealworms were also added in areas suspected or known to contain high proportions of Soricomorpha. Traps were placed every 5m along a 200m set transect with an additional 10 traps placed within 10m of the transect for incidental detections. Small mammals were identified to species when possible; age, sex, and reproductive status of each individual was also recorded when possible. Measurements such as weight and length were not recorded unless necessary for identification. Our trapping began in July and ended in October when the nightly low was below 40°F. Total survey trap effort concluded at 1500 trap nights (trap number*sites trapped).

No individual was killed for collection; however, individuals that died in trap were collected. Total trap death equaled 7 individuals or 2.9% (Table 1). This trap death is down 0.4% from the previous trap year (2470 trap nights with 3.3% trap death). All deaths were Soricomorpha, which are prone to trap death from starvation due to high metabolism. Out of all Soricomorpha captured 28% died in the trap (which is significantly lower than found in the literature)¹. This number is 4% higher than the previous year which had Soricomorpha death rate at only 24%. Perhaps the colder temperatures were more fatal for *Sorex* spp. this year, potentially negating the impact of addition of mealworms.

Table 1. Small Mammals Detected at the Crane Trust

Scientific Name	Common Name	Number Trapped	Mortality
<i>Blarina brevicauda</i>	Short-tailed Shrew	22	4
<i>Ictidomys tridecimlineatus</i>	Thirteen-lined Ground Squirrel	1	0
<i>Microtus ochrogaster</i>	Prairie Vole	5	0
<i>Microtus pennsylvanicus</i>	Meadow Vole	96	0
<i>Peromyscus leucophagus</i>	White-footed Mouse	48	0
<i>Peromyscus maniculatus</i>	Deer Mouse	44	0
<i>Peromyscus sp.</i>	-	3	0
<i>Reithrodontomys megalotis</i>	Western Harvest Mouse	6	0
<i>Reithrodontomys montanus</i>	Plains Harvest Mouse	3	0
<i>Sorex cinereus</i>	Masked Shrew	2	2
<i>Sorex haydeni</i> *	Prairie Shrew*	1	1
<i>Zapus hudsonius</i>	Meadow Jumping Mouse	8	0
Totals		239	7

*Identification confirmation pending for this species.

¹ Do, R., Shonfield, J., & McAdam, A. G. (2013). Reducing accidental shrew mortality associated with small-mammal livetrapping II: a field experiment with bait supplementation. *Journal of Mammalogy*, 94(4), 754-760.

Birds

We conducted 1/8 mile-long (200m) moving surveys along set transects to be completed in 15 minutes, and stationary focal point surveys to also be completed in 15 minutes, with both methods starting from the same location. During these surveys all detected species were recorded (detected by sight and/or vocalization). The total number of individual birds detected of each species was recorded as within 50m or outside 50m of the point or transect. We did not try to estimate the real population, but counted the number of birds detected and treated that as an index for discerning the relative abundance of particular species (Abundant: daily, Common: two to three times per week, Uncommon: two to three times per month, Rare: two to three times per year, Occasional: not every year, Accidental: outside of normal range. For non-resident species the index applies only to migration periods for that species). Common names are consistent with AOU standards.

Surveys were conducted at 58 sites across Crane Trust properties beginning in March (and will continue throughout the winter) thus far equaling (as of 11/07/16) 97 surveys and 205 species (including incidental sightings during this time). No individual was taken for collection, nor were any dead specimens found and collected.

Table 2. Bird Detections and Abundance at the Crane Trust

Abundance Key: Abundant: daily, Common: two to three times per week, Uncommon: two to three times per month, Rare: two to three times per year, Occasional: not every year, Accidental: outside of normal range.

Common Name	Abundance 2016
Acadian Flycatcher	Occasional
American Bittern	Uncommon
American Coot	Common
American Crow	Common
American Goldfinch	Abundant
American Kestrel	Common
American Redstart	Rare
American Robin	Abundant
American Tree Sparrow	Common
American White Pelican	Common
American Wigeon	Uncommon
Baird's Sandpiper	Common
Bald Eagle	Common
Baltimore Oriole	Common
Bank Swallow	Uncommon
Barn Swallow	Abundant
Bell's Vireo	Uncommon
Belted Kingfisher	Common
Black Tern	Rare
Black-and-white Warbler	Uncommon
Black-billed Magpie	Rare

Common Name	Abundance 2016
Black-capped Chickadee	Common
Black-crowned Night-Heron	Uncommon
Black-necked Stilt	Occasional
Blackpoll Warbler	Rare
Blue Jay	Abundant
Blue-gray Gnatcatcher	Uncommon
Blue-winged Teal	Abundant
Bobolink	Common
Bonaparte's Gull	Rare
Brewer's Blackbird	Rare
Broad-winged Hawk	Uncommon
Brown Creeper	Uncommon
Brown Thrasher	Common
Brown-headed Cowbird	Abundant
Bufflehead	Common
Burrowing Owl	Rare
Cackling Goose	Uncommon
Canada Goose	Abundant
Canvasback	Rare
Caspian Tern	Occasional
Cattle Egret	Uncommon

Common Name	Abundance 2016
Cedar Waxwing	Common
Chimney Swift	Uncommon
Chipping Sparrow	Uncommon
Clay-colored Sparrow	Uncommon
Cliff Swallow	Abundant
Common Goldeneye	Uncommon
Common Grackle	Abundant
Common Merganser	Common
Common Nighthawk	Uncommon
Common Tern	Rare
Common Yellowthroat	Abundant
Cooper's Hawk	Uncommon
Dark-eyed Junco	Common
Dickcissel	Abundant
Double-crested Cormorant	Abundant
Downy Woodpecker	Uncommon
Eared Grebe	Rare
Eastern Bluebird	Uncommon
Eastern Kingbird	Common
Eastern Meadowlark	Uncommon
Eastern Phoebe	Uncommon

Common Name	Abundance 2016
Eastern Screech-Owl	Uncommon
Eastern Towhee	Uncommon
Eastern Wood-Pewee	Uncommon
Eurasian Collared-Dove	Uncommon
European Starling	Abundant
Ferruginous Hawk	Occasional
Field Sparrow	Uncommon
Forster's Tern	Common
Fox Sparrow	Rare
Franklin's Gull	Common
Gadwall	Uncommon
Golden Eagle	Rare
Golden-crowned Kinglet	Common
Grasshopper Sparrow	Common
Gray Catbird	Common
Gray-cheeked Thrush	Rare
Great Blue Heron	Common
Great Crested Flycatcher	Uncommon
Great Egret	Uncommon
Great Horned Owl	Common
Greater Prairie-Chicken	Uncommon
Greater Scaup	Common
Greater White-fronted Goose	Uncommon
Greater Yellowlegs	Common
Great-tailed Grackle	Uncommon
Green Heron	Uncommon
Green-winged Teal	Common
Hairy Woodpecker	Uncommon
Harris's Sparrow	Common
Henslow's Sparrow	Uncommon
Hermit Thrush	Occasional
Herring Gull	Rare
Horned Grebe	Rare
House Finch	Uncommon
House Sparrow	Uncommon
House Wren	Common
Hudsonian Godwit	Rare
Killdeer	Abundant
Lark Bunting	Rare

Common Name	Abundance 2016
Lark Sparrow	Rare
Le Conte's Sparrow	Common
Least Flycatcher	Uncommon
Least Sandpiper	Common
Least Tern	Uncommon
Lesser Scaup	Common
Lesser Yellowlegs	Abundant
Lincoln's Sparrow	Common
Loggerhead Shrike	Rare
Long-billed Dowitcher	Uncommon
Mallard	Common
Marbled Godwit	Rare
Marsh Wren	Uncommon
Merlin	Uncommon
Mourning Dove	Abundant
Mourning Warbler	Rare
Nashville Warbler	Uncommon
Northern Bobwhite	Abundant
Northern Cardinal	Common
Northern Flicker	Abundant
Northern Harrier	Abundant
Northern Pintail	Uncommon
Northern Rough-winged Swallow	Uncommon
Northern Shoveler	Common
Northern Shrike	Rare
Olive-sided Flycatcher	Rare
Orange-crowned Warbler	Rare
Orchard Oriole	Common
Osprey	Uncommon
Ovenbird	Rare
Palm Warbler	Rare
Pectoral Sandpiper	Uncommon
Peregrine Falcon	Rare
Pied-billed Grebe	Common
Pine Siskin	Uncommon
Piping Plover	Uncommon
Prairie Falcon	Uncommon
Red-bellied woodpecker	Common
Redhead	Uncommon

Common Name	Abundance 2016
Red-headed Woodpecker	Common
Red-tailed Hawk	Common
Red-winged Blackbird	Abundant
Ring-billed Gull	Common
Ring-necked Duck	Uncommon
Ring-necked Pheasant	Common
Rock Pigeon	Uncommon
Rose-breasted Grosbeak	Uncommon
Rough-legged Hawk	Uncommon
Ruby-crowned Kinglet	Common
Ruby-throated Hummingbird	Uncommon
Ruddy Duck	Common
Rusty Blackbird	Rare
Sanderling	Rare
Sandhill Crane	Abundant
Savannah Sparrow	Abundant
Say's Phoebe	Rare
Scarlet Tanager	Rare
Sedge Wren	Abundant
Semipalmated Plover	Uncommon
Semipalmated Sandpiper	Common
Sharp-shinned hawk	Uncommon
Short-billed Dowitcher	Common
Short-eared Owl	Common
Snow Goose	Abundant
Snowy Egret	Rare
Solitary Sandpiper	Uncommon
Song Sparrow	Common
Sora	Uncommon
Spotted Sandpiper	Common
Spotted Towhee	Common
Sprague's Pipit	Occasional
Stilt Sandpiper	Uncommon
Swainson's Hawk	Uncommon
Swainson's Thrush	Common
Swamp Sparrow	Rare
Tennessee Warbler	Rare
Tree Swallow	Common
Turkey Vulture	Common

Common Name	Abundance 2016
Upland Sandpiper	Uncommon
Vesper Sparrow	Uncommon
Virginia Rail	Uncommon
Warbling Vireo	Uncommon
Western Kingbird	Uncommon
Western Meadowlark	Abundant
Western Sandpiper	Common
White-breasted Nuthatch	Uncommon
White-crowned Sparrow	Rare

Common Name	Abundance 2016
White-faced Ibis	Uncommon
White-rumped Sandpiper	Uncommon
White-throated Sparrow	Uncommon
Whooping Crane	Rare
Wild Turkey	Uncommon
Willet	Rare
Willow Flycatcher	Common
Wilson's Phalarope	Common
Wilson's Snipe	Uncommon

Common Name	Abundance 2016
Wilson's Warbler	Rare
Wood Duck	Abundant
Wood Thrush	Occasional
Yellow Rail	Occasional
Yellow Warbler	Abundant
Yellow-headed Blackbird	Common
Yellow-rumped Warbler	Common

Fish

Each survey consisted of seven to eight runs totaling ~150m of the slough. Using a net sized to the general width of the slough channel we ran the net at the slough bottom capturing as many fish as possible. We then dumped those fish into a 5 gallon bucket for identification and counting purposes. No individuals were collected. Two sloughs and a river channel were sampled across five sampling efforts between July 21st and August 17th, resulting in an estimated 750m of waterway sampled

Table 3. Fish Detected at the Crane Trust

Species Name	Common Name	Number Detected
<i>Notropis dorsalis</i>	Bigmouth Shiner	6
<i>Hybognathus hankinsoni</i>	Brassy Minnow	282
<i>Labidesthes sicculus</i>	Brook Silverside	1
<i>Culaea inconstans</i>	Brook Stickleback	772
<i>Ictalurus punctatus</i>	Channel Catfish	5
<i>Semotilus atromaculatus</i>	Creek Chub	12
<i>Etheostoma exile</i>	Iowa Darter	16
<i>Pimephales promelas</i>	Fathead Minnow	2
<i>Gambusia affinis</i>	Western Mosquitofish	4198
<i>Fundulus kansae</i>	Northern Plains Killifish	1
<i>Fundulus sciadicus</i>	Plains Topminnow	310
<i>Cyprinella lutrensis</i>	Red Shiner	27
<i>Notropis blennioides</i> & <i>Notropis stramineus</i>	River or Sand Shiner	130
<i>Immature-Unidentified</i>	Immature-Unidentified	60
<i>Perca flavescens</i>	Yellow Perch	1
Total		5823

Vegetation

Any plants in excellent condition, in fruit or flower (ideally both), were collected for the Crane Trust herbarium. We recorded the area where the plant was found to the nearest transect, the date it was collected, and its relative abundance in the area. We collected 264 plants from across the Crane Trust properties (Table 4). Collections were made across the properties of the Crane Trust by J. Wiese, A. Caven, I. Vilella, and K. King. Identification was done by A. Caven and J. Wiese.

Additionally, vegetation surveys using both point-line intercept (every two meters) and quadrat (0.5m x 1.0m every 10m) methods along a 100m permanently marked transect were conducted. Surveys began in July and ended in early October with the first frost.

Table 4. Plant Specimens Collected for the Crane Trust Herbarium.

Family	Scientific Name	Common Name
Alismataceae	<i>Sagittaria latifolia</i> Willd.	Broadleaf arrowhead
Apiaceae	<i>Cicuta maculata</i> L.	Spotted waterhemlock
Apiaceae	<i>Cicuta maculata</i> L.	Spotted water hemlock
Apiaceae	<i>Cicuta maculata</i> L.	Spotted water hemlock
Apiaceae	<i>Cicuta maculata</i> L.	Spotted water hemlock
Apiaceae	<i>Cicuta maculata</i> L.	Spotted water hemlock
Apocynaceae	<i>Apocynum cannabinum</i> L.	Indianhemp/hemp dogbane
Apocynaceae	<i>Apocynum cannabinum</i> L.	Indianhemp/Hemp dogbane
Apocynaceae	<i>Apocynum cannabinum</i> L.	Indianhemp/Hemp dogbane
Asclepidaceae	<i>Asclepias incarnata</i> L.	Swamp milkweed
Asclepidaceae	<i>Asclepias sullivantii</i> Engelm. ex A. Gray	Prairie/Sulivant's milkweed
Asteraceae	<i>Achillea millefolium</i> L.	Common Yarrow
Asteraceae	<i>Ambrosia artemisiifolia</i> L.	Annual ragweed
Asteraceae	<i>Ambrosia psilostachya</i> DC.	Western ragweed
Asteraceae	<i>Antennaria neglecta</i> Greene	Field pussytoes
Asteraceae	<i>Arctium minus</i> Bernh.	Lesser burdock
Asteraceae	<i>Artemisia ludoviciana</i> Nutt.	White sagebrush
Asteraceae	<i>Aster praealtus</i> Poir.	Willowleaf aster
Asteraceae	<i>Bidens comosa</i> L.	Threelobe beggartick
Asteraceae	<i>Bidens comosa</i> L.	Threelobe beggartick
Asteraceae	<i>Carduus nutans</i> L.	Knodding/musk plumeless thistle
Asteraceae	<i>Cirsium altissimum</i> (L.) Hill	Tall thistle
Asteraceae	<i>Cirsium arvense</i> (L.) Scop.	Canada Thistle
Asteraceae	<i>Cirsium arvense</i> (L.) Scop.	Canada Thistle

Family	Scientific Name	Common Name
Asteraceae	<i>Cirsium arvense</i> (L.) Scop.	Canada Thistle
Asteraceae	<i>Cirsium flodmanii</i> (Rydb.) Arthur	Flodman's thistle
Asteraceae	<i>Cirsium flodmanii</i> (Rydb.) Arthur	Flodman's thistle
Asteraceae	<i>Cirsium flodmanii</i> (Rydb.) Arthur	Flodman's thistle
Asteraceae	<i>Cirsium flodmanii</i> (Rydb.) Arthur	Flodman's thistle
Asteraceae	<i>Coryza canadensis</i> L.	Horsetail
Asteraceae	<i>Eclipta prostrata</i> (L.) L.	Yerba de Tajo/False Daisey
Asteraceae	<i>Gnaphalium</i> sp. L.	Cudweed
Asteraceae	<i>Grindelia squarrosa</i> (Pursh) Dunal	Curlycup gumweed
Asteraceae	<i>Helenium autumnale</i> L.	Common sneezeweed
Asteraceae	<i>Helenium autumnale</i> L.	Common sneezeweed
Asteraceae	<i>Heterotheca latifolia</i> Buckley	Camphorweed
Asteraceae	<i>Heterotheca villosa</i> (Pursh) Shinnars	Hairy false goldenaster
Asteraceae	<i>Heterotheca villosa</i> (Pursh) Shinnars	Hairy false goldenaster
Asteraceae	<i>Iva annua</i> L.	Annual marsh elder
Asteraceae	<i>Liatris punctata</i> Hook.	Dotted blazing star
Asteraceae	<i>Lygodesmia juncea</i> (Pursh) D. Don ex Hook.	Rush skeletonplant
Asteraceae	<i>Solidago canadensis</i> L.	Canada goldenrod
Asteraceae	<i>Solidago canadensis</i> L.	Canada goldenrod
Asteraceae	<i>Solidago missouriensis</i> Nutt.	Missouri goldenrod
Asteraceae	<i>Solidago missouriensis</i> Nutt.	Missouri goldenrod
Asteraceae	<i>Solidago missouriensis</i> Nutt.	Missouri goldenrod
Asteraceae	<i>Solidago rigida</i> L.	Stiff goldenrod
Asteraceae	<i>Solidago rigida</i> L.	Stiff goldenrod

Family	Scientific Name	Common Name
Asteraceae	<i>Sonchus asper</i> (L.) Hill	Spiny sowthistle
Asteraceae	<i>Vernonia baldwinii</i> Torr.	Baldwin's ironweed
Boraginaceae	<i>Hackelia virginiana</i> (L.) I.M. Johnst.	Beggarstick
Brassicaceae	<i>Rorippa curvipes</i> Greene	Bluntleaf yellowcress
Brassicaceae	<i>Rorippa curvipes</i> Greene	Bluntleaf yellowcress
Brassicaceae	<i>Rorippa curvipes</i> Greene var. <i>truncata</i> (Jeps.) Rollins	Bluntleaf yellowcress
Brassicaceae	<i>Rorippa curvipes</i> Greene var. <i>truncata</i> (Jeps.) Rollins	Bluntleaf yellowcress
Brassicaceae	<i>Sisymbrium loeselii</i> L.	Small tumbleweed mustard
Brassicaceae	<i>Sisymbrium loeselii</i> L.	Small tumbleweed mustard
Campanulaceae	<i>Lobelia cardinalis</i> L.	Cardinalflower
Campanulaceae	<i>Lobelia siphilitica</i> L.	Great blue lobelia
Campanulaceae	<i>Lobelia spicata</i> Lam.	Palespike lobelia
Campanulaceae	<i>Lobelia spicata</i> Lam.	Palespike lobelia
Campanulaceae	<i>Lobelia spicata</i> Lam.	Palespike lobelia
Campanulaceae	<i>Lobelia spicata</i> Lam.	Palespike lobelia
Caprifoliaceae	<i>Sambucus canadensis</i> L.	American black elderberry
Caprifoliaceae	<i>Sambucus canadensis</i> L.	American black elderberry
Caprifoliaceae	<i>Symphoricarpos occidentalis</i> Hook.	Western snowberry
Caryophyllaceae	<i>Cerastium brachypodum</i> (Engelm. ex A. Gray) B.L. Rob.	Shortstalk chickweed
Caryophyllaceae	<i>Cerastium brachypodum</i> (Engelm. ex A. Gray) B.L. Rob.	Shortstalk chickweed
Caryophyllaceae	<i>Dianthus armeria</i> L.	Deptford pnk
Caryophyllaceae	<i>Dianthus armeria</i> L.	Deptford pnk
Caryophyllaceae	<i>Silene antirrhina</i> L.	Sleepy catchfly
Caryophyllaceae	<i>Silene antirrhina</i> L.	Sleepy catchfly
Caryophyllaceae	<i>Silene antirrhina</i> L.	Sleepy catchfly
Chenopodiaceae	<i>Chenopodium pratericola</i> Rydb.	Desert goosefoot
Chenopodiaceae	<i>Chenopodium album</i> L.	Lambsquarters
Chenopodiaceae	<i>Cycloloma atriplicifolium</i> (Spreng.) J.M. Coult.	Winged pigweed
Chenopodiaceae	<i>Cycloloma atriplicifolium</i> (Spreng.) J.M. Coult.	Winged pigweed
Clusiaceae	<i>Hypericum perforatum</i> L.	Common St. Johnswort
Clusiaceae	<i>Hypericum perforatum</i> L.	Common St. Johnswort
Clusiaceae	<i>Hypericum perforatum</i> L.	Common St. Johnswort
Commelinaceae	<i>Tradescantia occidentalis</i> (Britton) Smyth	Prairie Spiderwort
Convolvulaceae	<i>Calystegia sepium</i> (L.) R. Br. subsp. <i>angulata</i> Brummitt	Hedge false bindweed
Convolvulaceae	<i>Convolvulus arvensis</i> L.	Field bindweed
Cuscutaceae	<i>Cuscuta glomerata</i> Choisy	Rope dodder

Family	Scientific Name	Common Name
Cuscutaceae	<i>Cuscuta glometa</i> Choisy	Rope dodder
Cuscutaceae	<i>Cuscuta glometa</i> Choisy	Rope dodder
Cuscutaceae	<i>Cuscuta gronovii</i> Willd. ex Schult.	
Cuscutaceae	<i>Cuscuta gronovii</i> Willd. ex Schult.	
Cuscutaceae	<i>Cuscuta gronovii</i> Willd. ex Schult.	Scalldweed
Cuscutaceae (Convolvulaceae)	<i>Cuscuta glomerata</i> Choisy	Rope dodder
Cyperaceae	<i>Bolboschoenus fluviatilis</i> (Torr.) Soják	River bulrush
Cyperaceae	<i>Carex brevior</i> (Dewey) Mack.	Shortbeaked sedge
Cyperaceae	<i>Carex eleocharis</i> L.H. Bailey	Needleleaf sedge
Cyperaceae	<i>Carex eleocharis</i> L.H. Bailey	Needleleaf sedge
Cyperaceae	<i>Carex granularis</i> Muhl. ex Willd.	Limestone meadow sedge
Cyperaceae	<i>Carex praegracilis</i> W. Boott	Clustered field sedge
Cyperaceae	<i>Carex vulpinoidea</i> Michx.	Fox sedge
Cyperaceae	<i>Carex vulpinoidea</i> Michx.	Fox sedge
Cyperaceae	<i>Cyperus erythrorhizos</i> Muhl.	Redroot flatsedge
Cyperaceae	<i>Cyperus esculentus</i> L.	Yellow Nutsedge
Cyperaceae	<i>Fuirena simplex</i> Vahl.	Western umbrella-sedge
Cyperaceae	<i>Lipocarpha aristulata</i> (Coville) G. Tucker	Awned halfchaff sedge
Cyperaceae	<i>Lipocarpha aristulata</i> (Coville) G. Tucker	Awned halfchaff sedge
Cyperaceae	<i>Lipocarpha micrantha</i> (Vahl) G. Tucker	Smallflower halfchaff sedge
Cyperaceae	<i>Scirpus pallidus</i> (Britton) Fernald	Cloaked bulrush
Equisetaceae	<i>Equisetum laevigatum</i> A. Braun	Smooth horsetail
Euphorbiaceae	<i>Croton texensis</i> (Klotzsch) Müll. Arg.	Texas croton
Fabaceae	<i>Chamaecrista fasciculata</i> (Michx.) Greene	Partridge pea
Fabaceae	<i>Chamaecrista fasciculata</i> (Michx.) Greene	Partridge pea
Fabaceae	<i>Desmodium glutinosum</i> (Muhl. ex Willd.) Alph. Wood	Wood tick-clover
Fabaceae	<i>Lespedeza capitata</i> Michx.	Roundhead bushclover
Fabaceae	<i>Lotus purshianus</i> Clem. & E.G. Clem.	American bird'sfoot treefoil
Fabaceae	<i>Lotus purshianus</i> Clem. & E.G. Clem.	American bird's-foot trefoil
Fabaceae	<i>Pediomelum argophyllum</i> (Pursh) J. Grimes	Silverleaf Indian breadroot
Fabaceae	<i>Securigera varia</i> (L.) Lassen	Crownvetch
Fabaceae	<i>Securigera varia</i> (L.) Lassen	Crownvetch
Fabaceae	<i>Strophostyles leiosperma</i> (Torr. & A. Gray) Piper	Slickseed fuzbean
Gentianaceae	<i>Centaurium pulchellum</i> (Sw.) Druce	Branched centaury
Gentianaceae	<i>Centaurium pulchellum</i> (Sw.) Druce	Branched centaury

Family	Scientific Name	Common Name
Gentianaceae	<i>Eustoma grandiflorum</i> (Raf.) Shinnars	Showy prairie gentian
Gentianaceae	<i>Eustoma grandiflorum</i> (Raf.) Shinnars	Showy prairie gentian
Iridaceae	<i>Sisyrinchium campestre</i> E.P. Bicknell	Prairie blue-eyed grass
Iridaceae	<i>Sisyrinchium campestre</i> E.P. Bicknell	Prairie blue-eyed grass
Iridaceae	<i>Sisyrinchium campestre</i> E.P. Bicknell	Prairie blue-eyed grass
Iridaceae	<i>Sisyrinchium campestre</i> E.P. Bicknell	Prairie blue-eyed grass
Juncaceae	<i>Juncus nodosus</i> L.	Knotted rush
Juncaceae	<i>Juncus torreyi</i> Coville	Torrey's rush
Juncaceae	<i>Juncus torreyi</i> Coville	Torrey's rush
Lamiaceae	<i>Hedeoma hispida</i> Pursh	Rough false pennyroyal
Lamiaceae	<i>Hedeoma hispida</i> Pursh	Rough false pennyroyal
Lamiaceae	<i>Leonurus cardiaca</i> L.	Common Motherwort
Lamiaceae	<i>Leonurus cardiaca</i> L.	Common Motherwort
Lamiaceae	<i>Lycopus uniflorus</i> Michx.	Northern bugleweed
Lamiaceae	<i>Lycopus uniflorus</i> Michx.	Northern bugleweed
Lamiaceae	<i>Prunella vulgaris</i> L.	Common selfheal
Lamiaceae	<i>Salvia azurea</i> Michx. ex Lam.	Blue pitcher sage
Lamiaceae	<i>Salvia azurea</i> Michx. ex Lam.	Blue pitcher sage
Lamiaceae	<i>Salvia azurea</i> Michx. ex Lam.	Blue pitcher sage
Lamiaceae	<i>Teucrium canadense</i> L.	Canadian germander
Liliaceae	<i>Allium canadense</i> L. var. <i>lavandulare</i> (Bates) Ownbey & Aase	Meadow garlic
Liliaceae	<i>Allium canadense</i> L. var. <i>lavandulare</i> (Bates) Ownbey & Aase	Meadow garlic
Liliaceae	<i>Asparagus officinalis</i> L.	Common asparagus
Linaceae	<i>Linum sulcatum</i> Riddell	Grooved flax
Lythraceae	<i>Ammannia robusta</i> Heer & Regel	Grand redstem
Lythraceae	<i>Ammannia robusta</i> Heer & Regel	Grand redstem
Lythraceae	<i>Ammannia robusta</i> Heer & Regel	Grand redstem
Lythraceae	<i>Lythrum alatum</i> Pursh	Winged loosestrife
Lythraceae	<i>Lythrum alatum</i> Pursh	Winged loosestrife
Malvaceae	<i>Abutilon theophrasti</i> Medik.	Velvet leaf
Malvaceae	<i>Callirhoe involucrata</i> (Torr. & A. Gray) A. Gray	Purple poppy mallow
Malvaceae	<i>Hibiscus trionum</i> L.	Flower of an Hour
Malvaceae	<i>Malva pusilla x neglecta</i>	
Malvaceae	<i>Malva pusilla x neglecta</i>	
Molluginaceae	<i>Mollugo verticillata</i> L.	Green carpetweed

Family	Scientific Name	Common Name
Nyctaginaceae	<i>Mirabilis linearis</i> (Pursh) Heimerl	Narrowleaf 4 o'clock
Nyctaginaceae	<i>Mirabilis linearis</i> (Pursh) Heimerl	Narrowleaf 4 o'clock
Nyctaginaceae	<i>Mirabilis linearis</i> (Pursh) Heimerl	Narrowleaf 4 o'clock
Oleaceae	<i>Fraxinus pennsylvatica</i> Marshall	Green Ash
Oleaceae	<i>Fraxinus pennsylvatica</i> Marshall	Green Ash
Onagraceae	<i>Oenothera biennis</i> L.	Common evening primrose
Onagraceae	<i>Oenothera serrulata</i> Nutt.	Yellow sundrops
Onagraceae	<i>Oenothera speciosa</i> Nutt.	Pinkladies
Orchidaceae	<i>Spiranthes magnicamporum</i> Sheviak	Great Plains lady's tresses
Oxalidaceae	<i>Oxalis dillenii</i> Jacq.	Yellow woodsorrel
Plantaginaceae	<i>Plantago eriopoda</i> Torr.	Redwool/alkaline plantain
Plantaginaceae	<i>Plantago eriopoda</i> Torr.	Redwool/alkaline plantain
Plantaginaceae	<i>Plantago major</i> L.	Common Plantain
Poaceae	<i>Agrostis stolonifera</i> L.	Creeping bentgrass
Poaceae	<i>Agrostis stolonifera</i> L.	Creeping bentgrass
Poaceae	<i>Bouteloua curtipendula</i> (Michx.) Torr.	Sideoats grama
Poaceae	<i>Bouteloua gracilis</i> (Willd. ex Kunth) Lag. ex Griffiths	Blue grama
Poaceae	<i>Bromus inermis</i> Leyss.	Smooth brome
Poaceae	<i>Bromus inermis</i> Leyss.	Smooth brome
Poaceae	<i>Bromus inermis</i> Leyss.	Smooth brome
Poaceae	<i>Bromus tectorum</i> L.	Downy brome/Cheatgrass
Poaceae	<i>Calamagrostis stricta</i> (Timm) Koeler	Slimstem reedgrass
Poaceae	<i>Calamagrostis stricta</i> (Timm) Koeler	Slimseed reedgrass
Poaceae	<i>Calamovilfa longifolia</i> (Hook.) Scribn.	Prairie sandreed
Poaceae	<i>Chloris verticillata</i> Nutt.	Tumble windmill grass
Poaceae	<i>Distichlis spicata</i> (L.) Greene	Saltgrass
Poaceae	<i>Echinochloa crus-galli</i> (L.) P. Beauv.	Barnyardgrass
Poaceae	<i>Echinochloa muricata</i> (P. Beauv.) Fernald	Rough barnyardgrass
Poaceae	<i>Eleusine indica</i> (L.) Gaertn.	Indian goosegrass
Poaceae	<i>Elymus elongatus</i> (Host) Runemark	Tall wheatgrass
Poaceae	<i>Elymus elongatus</i> (Host) Runemark	Tall wheatgrass
Poaceae	<i>Elymus repens</i> (L.) Gould	Quackgrass
Poaceae	<i>Elymus repens</i> (L.) Gould	Quackgrass
Poaceae	<i>Elymus smithii</i> (Rydb.) Gould	Western wheatgrass
Poaceae	<i>Elymus trachycaulus</i> (Link) Gould ex Shinnars	Slender wheatgrass

Family	Scientific Name	Common Name
Poaceae	<i>Elymus villosus</i> Muhl. ex Willd.	Hairy wheatgrass
Poaceae	<i>Eragrostis pectinacea</i> (Michx.) Nees ex Steud.	Tufted lovegrass
Poaceae	<i>Eragrostis pectinacea</i> (Michx.) Nees ex Steud.	Tufted lovegrass
Poaceae	<i>Leersia virginica</i> Willd.	Whitegrass
Poaceae	<i>Leptochloa fusca</i> (L.) Kunth	Malabar sprangletop
Poaceae	<i>Leptochloa fusca</i> (L.) Kunth var. <i>fascicularis</i> (Lam.) Dorn	Bearded sprangletop
Poaceae	<i>Leptochloa fusca</i> (L.) Kunth var. <i>fascicularis</i> (Lam.) Dorn	Bearded sprangletop
Poaceae	<i>Panicum acuminatum</i> Sw.	Western panicgrass
Poaceae	<i>Panicum oligosanthes</i> Schult.	Heller's rosette grass
Poaceae	<i>Panicum virgatum</i> L.	Switchgrass
Poaceae	<i>Paspalum setaceum</i> Michx.	Thin paspalum
Poaceae	<i>Paspalum setaceum</i> Michx.	Thin paspalum
Poaceae	<i>Poa compressa</i> L.	Canada bluegrass
Poaceae	<i>Schizachyrium scoparium</i> (Michx.) Nash	Little bluestem
Poaceae	<i>Setaria pumila</i> (Poir.) Roem. & Schult. subsp. <i>pumila</i>	Yellow foxtail
Poaceae	<i>Spartina pectinata</i> Bosc ex Link	Prairie cordgrass
Poaceae	<i>Sporobolus cryptandrus</i> (Torr.) A. Gray	Sand dropseed
Poaceae	<i>Triplasis purpurea</i> (Walter) Chapm.	Purple sandgrass
Poaceae	<i>Tripsacum dactyloides</i> (L.) L.	Eastern gamagrass
Poaceae	<i>Vulpia octoflora</i> (Walter) Rydb.	Six weeks fescue
Polygonaceae	<i>Polygonum convolvulus</i> L.	Black bindweed
Polygonaceae	<i>Rumex altissimus</i> Alph. Wood	Tall thistle
Polygonaceae	<i>Polygonum ramosissimum</i> Michx.	Bushy knotweed
Polygonaceae	<i>Rumex acetosella</i> L.	Common sheep sorrel
Polygonaceae	<i>Rumex acetosella</i> L.	Common sheep sorrel
Polygonaceae	<i>Rumex acetosella</i> L.	Common sheep sorrel
Polygonaceae	<i>Rumex acetosella</i> L.	Common sheep sorrel
Polygonaceae	<i>Rumex altissimus</i> Alph. Wood	Pale Dock
Polygonaceae	<i>Rumex fueginus</i> Phil.	Golden Dock
Polygonaceae	<i>Rumex fueginus</i> Phil.	Golden Dock
Primulaceae	<i>Lysimachia ciliata</i> L.	Fringed loosestrife
Ranunculaceae	<i>Clematis virginiana</i> L.	Devils darning needles
Ranunculaceae	<i>Clematis virginiana</i> L.	Devils darning needles
Ranunculaceae	<i>Clematis virginiana</i> L.	Devils darning needles
Rosaceae	<i>Potentilla norvegica</i> L.	Norwegian cinquefoil
Rosaceae	<i>Potentilla norvegica</i> L.	Norwegian cinquefoil
Rosaceae	<i>Potentilla recta</i> L.	Sulfur cinquefoil

Family	Scientific Name	Common Name
Rosaceae	<i>Potentilla recta</i> L.	Sulfur cinquefoil
Rutaceae	<i>Zanthoxylum americanum</i> Mill.	Common prickly ash
Salicaceae	<i>Salix amygdaloides</i> Andersson	Peachleaf willow
Salicaceae	<i>Salix exigua</i> Nutt. ssp. <i>interior</i> (Rowlee) Cronquist	Coyote/sandbar willow
Scrophulariaceae	<i>Agalinis purpurea</i> (L.)	Purple false foxglove
Scrophulariaceae	<i>Agalinis purpurea</i> (L.)	Purple false foxglove
Scrophulariaceae	<i>Agalinis tenuifolia</i> (Vahl) Raf.	Narrowleaf false foxglove
Scrophulariaceae	<i>Agalinis tenuifolia</i> (Vahl) Raf.	Narrowleaf false foxglove
Scrophulariaceae	<i>Penstemon gracilis</i> Nutt.	Lilac penstemon
Scrophulariaceae	<i>Penstemon gracilis</i> Nutt.	Lilac penstemon
Scrophulariaceae	<i>Verbascum blattaria</i> L.	Moth mullein
Scrophulariaceae	<i>Verbascum blattaria</i> L.	Moth mullein
Scrophulariaceae	<i>Verbascum thapsus</i> L.	Common mullein
Scrophulariaceae	<i>Veronica peregrina</i> L.	Neckweed
Solanaceae	<i>Datura stramonium</i> L.	Jimsonweed
Solanaceae	<i>Physalis hederifolia</i> A. Gray var. <i>comata</i> (Rydb.) Waterf.	Ivyleaf groundcherry
Solanaceae	<i>Physalis hederifolia</i> A. Gray var. <i>comata</i> (Rydb.) Waterf.	Ivyleaf groundcherry
Solanaceae	<i>Physalis hispida</i> (Waterf.) Cronquist	Prairie groundcherry
Solanaceae	<i>Physalis longifolia</i> Nutt.	Longleaf groundcherry
Solanaceae	<i>Physalis longifolia</i> Nutt.	Longleaf groundcherry
Solanaceae	<i>Physalis virginiana</i> Mill.	Virginia groundcherry
Solanaceae	<i>Solanum carolinense</i> L.	Carolina horsenettle
Solanaceae	<i>Solanum carolinense</i> L.	Carolina horsenettle
Solanaceae	<i>Solanum carolinense</i> L.	Carolina horsenettle
Solanaceae	<i>Solanum carolinense</i> L.	Carolina horsenettle
Solanaceae	<i>Solanum ptycanthum</i> Dunal	Black nightshade
Thelypteridaceae	<i>Thelypteris palustris</i> Schott	Eastern marsh fern
Ulmaceae	<i>Celtis occidentalis</i> L.	Common hackberry
Ulmaceae	<i>Ulmus americana</i> L.	American Elm
Ulmaceae	<i>Ulmus pumila</i> L.	Siberian Elm
Urticaceae	<i>Parietaria pensylvanica</i> Muhl. ex Willd.	Pennsylvania pellitory
Veberaceae	<i>Phryma leptostachya</i> L.	American lopseed
Verbenaceae	<i>Phyla lanceolata</i> (Michx.) Greene	Lanceleaf fogfruit
Verbenaceae	<i>Verbena bracteata</i> Cav. ex Lag. & Rodr.	Big-bract verbena
Verbenaceae	<i>Verbena bracteata</i> Cav. ex Lag. & Rodr.	Big-bract vervain
Verbenaceae	<i>Verbena hastata</i> L.	Swamp vervain
Verbenaceae	<i>Verbena stricta</i> Vent.	Hoary verbena

Family	Scientific Name	Common Name
Verbenaceae	<i>Verbena stricta</i> Vent.	Hoary verbena

Family	Scientific Name	Common Name
Zygophyllaceae	<i>Tribulus terrestris</i> L.	Puncture vine

Butterflies

Our butterfly monitoring protocol consists of a walking and netting survey. All species are recorded inside or outside of 10m with each survey lasting 15 minutes. The walking survey is a 200 meter transect that coincides with our avian monitoring transects. The netting survey occurs 50 meters into the 200 meter transect and is conducted after the walking survey. All species in the vicinity are caught and netted for 15 minutes. Then each butterfly is carefully examined for identification and then released. No mortality and no apparent wing injuries occurred during these surveys. However, occasionally a butterfly would lose part of a leg during the identification process. Skippers were more prone to this due to longer handling times for identification. It was sometimes necessary to identify a butterfly to a taxon level above species and that is reflected in the data (Table 5). Incidental sightings of species were also recorded.

We conducted 20 butterfly surveys across various parts of the Crane Trust properties. This resulted in the detection of 31 butterfly species and 633 individuals noted.

Table 5. Butterfly Detections

Scientific Name	Common Name	Total
<i>Speyeria aphrodite</i>	Aphrodite Fritillary	1
<i>Papilio bairdii</i>	Baird's Swallowtail	2
<i>Papilio polyxenes</i>	Black Swallowtail	1
Polyommatae	Blue	38
<i>Pieris rapae</i>	Cabbage White	1
<i>Pontia protodice</i>	Checkered White	4
<i>Colias philodice</i>	Clouded Sulphur	1
<i>Pyrgus communis</i>	Common Checkered Skipper	42
<i>Colias</i> spp.	<i>Colias</i> spp.	25
<i>Junonia coenia</i>	Common Buckeye	6
<i>Pholisora catullus</i>	Common Sootywing	1
Lycaninae	Copper sp.	1
<i>Nathalis iole</i>	Dainty Sulphur	12
<i>Everes comyntas</i>	Eastern Tailed Blue	34

Scientific Name	Common Name	Total
<i>Papilio glaucus</i>	Eastern Tiger Swallowtail	4
<i>Hylephila phyleus</i>	Fiery Skipper	6
<i>Lycaena dione</i>	Gray Copper	1
<i>Strymon melinus</i>	Gray Hairstreak	1
Hesperiinae	Grass Skippers	12
<i>Ancyloxypha numitor</i>	Least Skipper	4
<i>Polites mystic</i>	Long Dash	1
<i>Plebejus melissa melissa</i>	Melissa Blue	1
<i>Danaus plexippus</i>	Monarch	7
Nymphalidae spp.	Brushfoot spp.	2
<i>Colias eurytheme</i>	Orange Sulphur	94
<i>Vanessa cardui</i>	Painted Lady	1

Scientific Name	Common Name	Total
<i>Papilio</i> sp.	<i>Papilio</i> sp.	1
<i>Phyciodes tharos</i>	Pearl Crescent	52
<i>Polites peckius</i>	Peck's Skipper	7
<i>Polites</i> spp.	<i>Polites</i> spp.	6
<i>Hemiargus isola</i>	Reakirt's Blue	5
<i>Vanessa atalanta</i>	Red Admiral	2
<i>Speyeria idalia</i>	Regal Fritillary	7
<i>Atalopedes campestris</i>	Sachem	1

Scientific Name	Common Name	Total
<i>Epargyreus clarus</i>	Silver-spotted Skipper	1
Hesperiidae	Skipper	3
Coliadinae	Sulphur spp.	216
<i>Polites themistocles</i>	Tawny-edged Skipper	9
<i>Euptoieta claudia</i>	Varigated Fritillary	7
<i>Limenitis archippus</i>	Viceroy	1
<i>Poanes zabulon</i>	Zabulon Skipper	12
Total	31	633

Sandhill Crane Counts

We conducted 9 Sandhill Crane roost monitoring surveys in the Central Platte River Valley (Chapman to Overton, NE) between the dates of February 15th and April 15th, 2016. A total of 1,379,378 Sandhill Cranes (1,379,000 rounded to the nearest 1,000) were counted. This number is higher than the total number counted in most survey years, suggesting the cranes arrived early and stayed until their usual departure time. Therefore, we were more likely to count individual Sandhill Cranes multiple times. We counted 213,600 Sandhill Cranes on February 29th of 2016, this being by far the highest count in our records in February (2nd most is 62,900 recorded on 02/24/2009; Table 2). Interestingly, both of these years were El Nino years. Our highest count of Sandhill Cranes for 1 survey was 413,000 on March 14th. Additionally, bias estimation was added near the end of the 2015 survey season, following federal waterfowl count procedures, to better evaluate the accuracy of Sandhill Crane survey numbers. A minimum of 2-10 photo subplots (depending on the overall number of roosts) was added to coincide with roosts of various sizes. For these photo subplots, the whole roost was photographed to make photo-based office-derived counts as accurate as possible for comparison to aerial estimates. The average difference between photo subplots and aerial visual estimates was about $\pm 10\%$ for the 2016 survey season, and visual estimates broadly represented undercounts. As the counts presented here are raw data, they likely represent underestimates. On January, 13th, 2016 we additionally documented wintering Sandhill Cranes west of our Alda Farms property. The roost was likely located atop the artificial islands created by the PRRIP's riverine management. We found a large group foraging on remnant Sandhills prairies south of the Platte River, west of HWY 40c. Being careful not to double count, our estimate for the 30-minute survey was 2,083 Sandhill Cranes. This ground survey represented less than half of what was seemingly present, as when we finished the survey there were still Sandhill Cranes coming off their respective roosts and heading to feed in the aforementioned prairies. Therefore, we estimated this wintering population at a minimum of 5,000 birds.

Table 3. Sandhill Crane Counts from February: Historic and Current

Year	2016	2016	2015	2014	2013	2009	2006	2005
Date	22-Feb	29-Feb	23-Feb	26-Feb	28-Feb	24-Feb	28-Feb	28-Feb
Count	82,100	213,600	10,200	4,350	26,050	62,900	5,600	29,400

Conclusion

Implementing a long-term monitoring program will help us more critically assess the impacts of our management actions upon Whooping Cranes, Sandhill Cranes, and the other migratory and breeding bird species in the Big Bend region of the Platte River in Nebraska. This field season our efforts totaled 97 avian surveys, 30 small mammal surveys (1500 trap nights), 25 vegetation surveys, 20 butterfly surveys, and five days of fish seining; leading to 205 avian species detected, 239 small mammals trapped, 264 plants collected, 31 species of butterflies detected, and 5,823 fish caught and released. We thank the Nebraska Game and Parks Commission, the Rainwater Basin Joint Venture, and the US Fish and Wildlife Service for their continued support of our research program. This report represents preliminary findings and thus should be interpreted as such; our intention with this data is to produce peer-reviewed research that addresses issues of conservation concern in the Central Platte River Valley.