Antelope Creek Habitat Development Area
Summer Wildlife Technician Report 2019
Compiled by Megan McGlynn

Acknowledgements

Thank you to several organizations and individuals who supported this project. The Antelope Creek Ranch Habitat Development Area and in particular Neal Wilson and Shannon Burnard for the continued desire and willingness to participate in wildlife and rangeland research. This openness has allowed for further contribution toward enhancement and maintenance of wildlife habitat in southern Alberta.

The 2019 summer student, Megan McGlynn, was assisted by the following MULTISAR survey team from the Alberta Conservation Association (ACA) to complete wildlife surveys on Antelope Creek: Amanda MacDonald, Adam Moltzahn, Julie Landry-DeBoer, and Phil Rose. Assistance with grass clipping training was provided by Tanner Broadbent with Alberta Environment and Parks (AEP) and Sarah Yates from U.S. Fish and Wildlife Service provided waterfowl banding training.

Thank you to Amanda Miller, AEP, for coordination of the project, and an additional thank you to Katheryn Taylor, Prairie Conservation Forum (PCF) and Brad Downey (ACA) for their input and assistance in this project.

This project was funded by Antelope Creek Ranch and Alberta Fish and Game.

Executive Summary

Antelope Creek Ranch summer students are tasked with data collection and report writing for each summer season. Prior to data collection two months of training was provided off ranch with Multiple Species at Risk (MULTISAR). The 2019 season was focused on wildlife studies as former seasons focused on rangeland inventory work. This report is a collection of information regarding the work the summer student completed and the wildlife data they collected. The result is focused on summarizing wildlife within categorizes; Avian, Mammals, Reptiles and Amphibians. Overall, the study found that a high diversity of wildlife species utilizes the natural landscape that Antelope Creek Ranch offers. This included two species at risk; Ferruginous Hawk and Chestnut-collared Longspur.

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1 Introduction

1.1 Monthly Activity Summaries

1.1.1 May 2019

The first week of May for the summer student was spent getting oriented to the Lethbridge offices. The first few days were situated at the Lethbridge Research and Development Center, where government accounts and field equipment was assigned. Following the completion of these administrative tasks, the work was moved to the Alberta Conservation Association building. In this location the remainder of the first week was filled with field preparation, meetings, practising both sight and sound avian identification along with project planning. Assistance with ferruginous hawk surveys took place the following week. These surveys were then followed by Sharp tail grouse surveys on several different properties. During both survey periods, training was provided by staff working on the MULTISAR project. Quad Safety Training was provided by Gateway Safety Services Ltd and completed halfway through May. Geographic Information System maps were prepared for Antelope Creek Ranch during the second last week of May. During this time wildlife survey routes and point count locations were delegated. Wildlife survey and point count training took place for the remainder of the month, with only a brief intermission to attend a Bear Safety Training on 24 May 2019.

1.1.2 June 2019

June was spent conducting wildlife surveys on a variety of properties participating in the MULTISAR program. These surveys included point counts and recording incidental wildlife occurrences. Wildlife survey training continued in a variety of different habitats and locations. Species sightings were also reviewed to ensure continuous development of correct species identification. Strong identification skills of both common and uncommon wildlife species were developed during this time. Rangeland health training was provided on 27 May by Amanda Miller and Craig DeMaere with AEP. Wildlife surveys were started on Antelope Creek Ranch at the end of June.

1.1.3 July 2019

July marked the move out to Antelope Creek Ranch Habitat Development Area. The summer student was permitted to board and use her personal ranch horses for work on Antelope Creek Ranch. Wildlife surveys were completed by the first week of July on Antelope Creek Ranch. Much of July was spent moving and checking cattle, checking and repairing barb wire fence and taking down old corral pens. On 13 June 2019, there was the opportunity to attend the Calgary Stampede and provide environmental education from the Cattle Trail Environmental booth that MULTISAR participates in. Both ranch manager, Neal Wilson, and Wildlife Technician, Megan McGlynn, provided this service. Cattle continued to be checked using both personal equine and motorized four-wheelers. Fence maintenance and repair also continued throughout the month. Due to a water line break some days were spent digging up the old water line and trying to repair the damage. Once all the corral pens were torn down and properly disposed of, new pens were built. The building of these pens took up the remainder of July. On the last day of July, amphibian survey training was provided, and amphibian surveys were completed on Antelope Creek Ranch.

1.1.4 August 2019

Basic ranch duties continued to be completed during August such as checking, moving, providing salt and mineral, fixing fence and controlling water usage. Forage clipping training was provided by Tanner Broadbent from AEP. Cage and enclosure clipping samples for all pastures were collected during the second week of August. The last of the fencing to complete Antelope Creek Ranches wildlife friendly fencing project was completed in early August in the flood fields as the bottom wire was removed to replace it with smooth wire. Making the majority of Antelope Creek Ranch fencing wildlife friendly. Personal ranch horses were transported home during the second last week of August. U.S. Fish and Wildlife Service staff, Sarah Yates and team, came to the ranch early August to do some duck banding. On 15 August 2019 basic waterfowl training was provided by Sarah Yates with U.S. Fish and Wildlife Service. Setting of waterfowl traps, baiting, handling, and ethics were discussed and the remainder of the day was

spent banding captured ducks. The remainder of August was spent in office at the Lethbridge Research and Development Centre compiling data into a report.

1.2 Report Introduction

Antelope Creek Ranch Habitat Development Area provides a unique opportunity for a variety of environmental studies. Each year the ranch hires and trains a summer student. In the past several years, these summer students have been focused on the cataloging of rangeland plant communities in the native grassland pasture and documenting the extent of disturbance from man-made development on the property. In 2019, the focus shifted slightly to study the wildlife that utilize the ranch. As a wildlife refuge amongst seas of agricultural fields, the potential for key wildlife habitat on this property is quite high.

In these wildlife studies, appropriate survey techniques and protocols were utilized to gain a better understanding of wildlife species using the area. The main objective of this study was to provide information to the ranch manager on some of the detectable species present on the property. This will provide more information to the manager that could prove useful in determining future management plans. With this information beneficial management practice guidelines provided by the MULTISAR (Multiple Species at Risk) project can be provided based on the species present. As a functioning ranch, the knowledge of the species present can be of substantial value. It is hypothesized that this area will have a high usage by both large and small mammals, as well as, several waterfowl and avian species.

2 Study Area

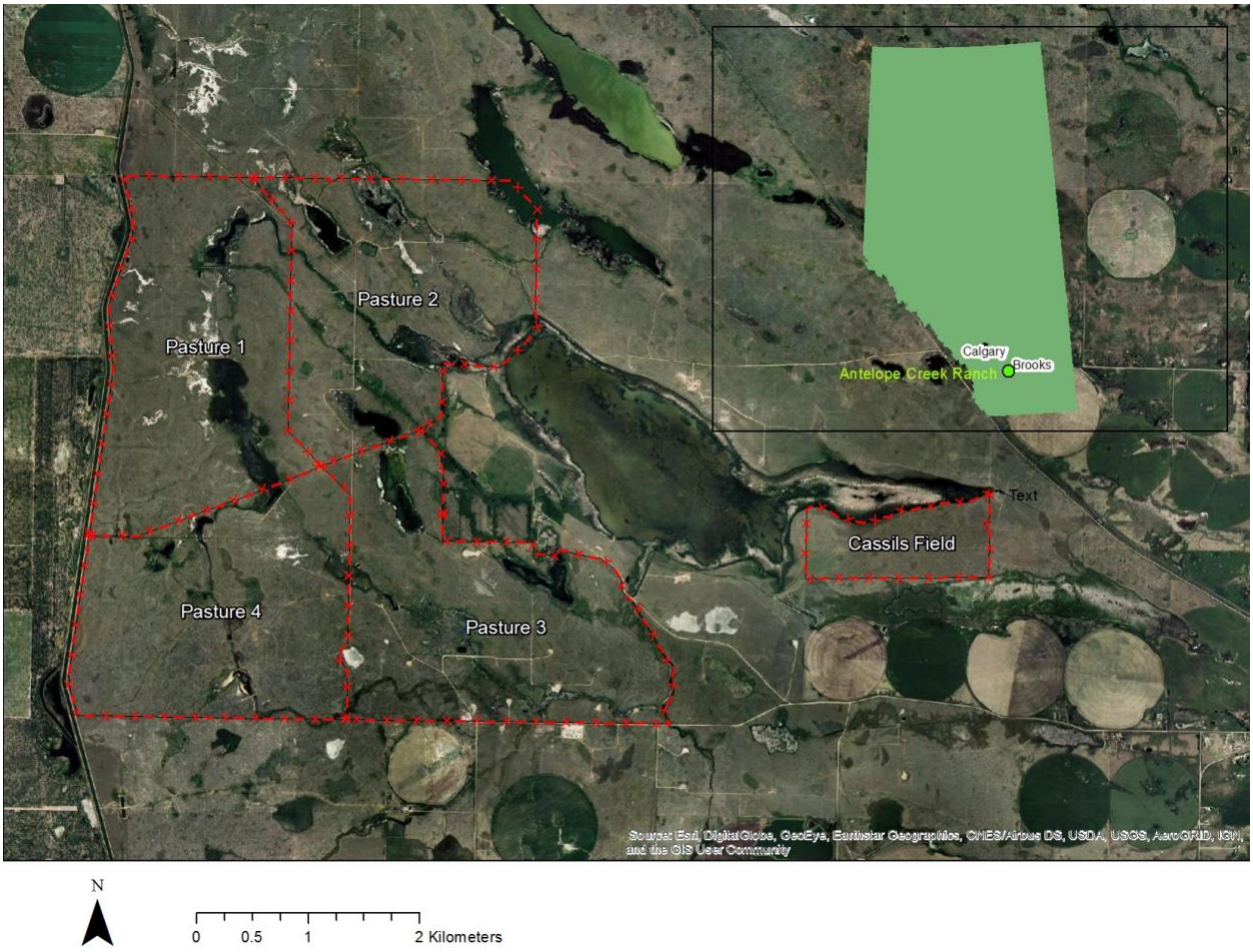

Figure 1. Map Location of Antelope Creek Ranch Habitat Development Area

Antelope Creek Ranch Habitat Development Area is located ~20 km west of Brooks, Alberta. The ranch is 5,500-acre of cattle grazed rangeland, roughly 600 acres of disturbed oil field sites and a functioning research location. It is in the Dry Mixedgrass Natural Subregion of the Grassland Natural Region of the province. The ranch was established in 1986, when it was purchased through a partnership between the Alberta Fish and Game Association (AFGA), Ducks Unlimited (DU), Alberta Environment and Parks (AEP), and Wildlife Habitat Canada (WHC). Today the ranch is managed by Neal Wilson and Shannon Burnard. The property has several substantial water bodies including Lake San Francisco and 36 man-made wetlands that

are managed by Ducks Unlimited Canada (DUC 2007) and Ranch Managers. There are also smaller ephemeral areas including canals, spillover from canal systems, spillover from wetlands and natural depressions.

Climate characteristics of this region are typically short summers with hot and warm days and long cold winters with low snow cover (Alberta Agriculture and Forestry 2019). The mean monthly precipitation for 1 May- 19 August 2019 in Brooks, Alberta was 26.03 mm which down from the 44.75mm average (Alberta Agriculture and Forestry 2019 **Table.4** in the appendix). This year was noted by Neal Wilson, the ranch manager to be a very dry year (personal communication, 2019). Antelope Creek Ranch's location often has different weather conditions than the location of the nearest monitoring weather meter and was missed by several rain showers that the weather station did collect. The mean temperature for the summer of 2019 was 15.41°C (Alberta Agriculture and Forestry 2019). Chernozemic soils are characteristic of the Grasslands Natural region and, variations in soil types play a role in describing the subregion of the grassland, determining site potential and potential plant communities that can be supported (Adams et al. 2013). The main soils in the Dry Mixedgrass subregion are Solonetzic and Brown Chernozems (Adams et al. 2013). Topography is dominantly level to gently undulating semi-arid prairie that is broken into pieces by coulees, valleys, dune fields and badlands (Alberta Parks, 2015). The presence of blowout range sites is also common within the study area. The elevation of Antelope Creek Ranch is ~768m and is located in the South Saskatchewan River Basin.

Antelope Creek Ranch is dominated by a native prairie landscape and used for livestock grazing. Native grassland forage value is high for winter forage not only for livestock but for wildlife species like pronghorn. It produces a blanket of successful overwintering habitat for various wildlife species and providing high quality habitat for avian species and amphibians.

3 Methods

The biophysical study was conducted 24 June, 6 July and 31 July 2019 on Antelope Creek Ranch Habitat Development Area. Wildlife surveys were completed to provide detailed data on wildlife occurring on the property and to aid in the development of wildlife management

recommendations. The detailed wildlife inventories incorporated various survey methods including multi-species (point count) surveys, as well as targeted surveys for burrowing owls, waterfowl, and amphibians. The methods for all wildlife surveys conducted on the property are detailed in the following sections.

3.1 Avian Surveys

3.1.1 Multi-species surveys

Point count locations were determined according to previously mapped GVI information (Figure.2 in Appendix). GPS locations were created for each point and these locations were then loaded into GPS systems and once upon site used to navigate to the point location. Multi-species wildlife surveys were conducted in the early morning from sunrise up to 10:30 am, when the wind was less than 20 km/hr. and there was no rain or snow. Surveyors walked to their assigned, pre-determined wildlife survey points and waited one to two minutes prior to beginning the count. This allowed for birds to settle down and acclimate to the presence of the surveyor. Surveyors then completed a five-minute wildlife survey in which all birds, mammals, amphibians and reptiles seen or heard within the applicable survey distance (either a 100m or 50m pre-determined distance from observer). During point counts, each wildlife species and total numbers seen and heard of each species, sex (if easily noted), age (if possible) was recorded. Information recorded in notebooks included point count location, date, roble pole measurement, distance categories to avian, weather, and time (Figure 3 in appendix).

While at the survey location, a Robel pole measurement was also taken following protocols by Robel et al. (1970).

Incidental observations were recorded between point count locations or during other targeted surveys. For instance, this occurred, if a species of significance was observed during a point count but outside the boundary of the point count area. All observations included the GPS location, or the relative location, along with the date and time (**Figure 5**. in appendix). If

incidental observations were recorded during the 5-minute point count, then the distance and direction from the point was recorded. Important findings such as sharp-tailed grouse leks, burrows, and nests were also recorded in this manner. Once surveys were complete wildlife data was entered into the Fish and Wildlife Management Information System (FWMIS).

3.2 Targeted Species Surveys

3.2.1 Burrowing Owl

An electronic playback survey for burrowing owls was conducted during multi-species surveys in areas of suitable habitat and absence of nearby predators. A wildlife caller was used to broadcast a burrowing owl call to the area while the surveyor looked and listened for responding owls. If an owl was located, the surveyor attempted to locate the nest burrow, at which time additional information was recorded (number of owls present, sign, site photos, GPS location, etc.).

3.2.2 Wetland Walks (Waterfowl and Shorebirds)

Wetland searches were conducted between point count surveys. Surveys walked along the edges of wetlands stopping to observe species within the wetland. Species observed were recorded as incidental species observations and recorded in the same manner as the multi-species surveys.

3.2.3 Mammalian Surveys

Mammals were recorded during multi-species point counts, incidentally and from observations disclosed by Neal Wilson, Antelope Creek Ranch Manager.

3.2.4 Amphibian Surveys

Amphibian Surveys were conducted simultaneously with wetland walks. The surveys were completed after breeding season and after this year's amphibian hatch (Middle of July-August).

This ensured that despite the small size of many amphibian species, their abundance would still allow for them to be located. Once encountering amphibians, the exact GPS location or the relative location was recorded, along with the date, sex, and age (**Figure 6** in Appendix).

4 Results

4.1 Avian Species

Eighty- eight (88) different bird species were documented on Antelope Creek Ranch in 2019 (Table 1). Of these species, twenty-four (24) of them are considered to be Sensitive based on the Alberta Wild Species General Status Listing of 2015 (Government of Alberta 2017). Loggerhead Shrike and Sprague's pipit are two species listed as Sensitive and considered to be of Special concern in the Alberta Wildlife Act (Government of Alberta 2017) and Threatened under the General Status- COSEWIC Assessment. Ferruginous Hawk and Chestnut-collared Longspur, two species considered to be At Risk species under the General Status Alberta 2015 were also recorded. Under the Wildlife Act, the Ferruginous hawk pair observed sitting on the south fence line of pasture (Three 3), (**Figure 7.** In appendix) are considered to be Endangered (Government of Alberta 2017). The species observed ranged from song birds such as yellow warblers to large birds such as American crows. The most frequently recorded species was the savannah sparrow with one hundred and twenty-nine documented. Thirty-seven (37) of the bird species recorded are strongly associated with wetland environments and forty-nine (49) of the species recorded are strongly associated with native upland habitat. Upland avian species can benefit from the habitat created by cattle grazing. Grazing practices that employ light to moderate grazing allow for a mosaic of different habitat availability. Horned Larks recorded prefer shorter grass which can be provided by moderate cattle grazing. Sprague's Pipit also recorded on the survey prefer a lightly grazed pasture. Additionally, there were several birds documented that are considered habitat generalists. No Burrowing Owls were recorded during surveys.

Table 1. Number of Avian Species Recorded on Antelope Creek Ranch in 2019

AMERICAN AVOCET (14)	AMERICAN COOT (36)
AMERICAN BITTERN**(N/A)	AMERICAN GREEN-WINGED TEAL**(N/A)
AMERICAN CROW (2)	AMERICAN GOLD FINCH** (N/A)
AMERICAN GOLDEN-PLOVER (2)	AMERICAN KESTREL** (N/A)
AMERICAN ROBIN (1)	AMERICAN WHITE PELICAN (6)
AMERICAN WIGEON (1)	BAIRD'S SPARROW (4)
BARN SWALLOW (6)	BLACK TERN (4)
BLACK-BILLED MAGPIE (6)	BLACK-CROWNED NIGHT-HERON (2)
BLACK-NECKED STILT (17)	GREAT BLUE HERON** (N/A)
BLUE-WINGED TEAL (12)	BOBOLINK ** (N/A)
BREWER'S BLACKBIRD (17)	BROWN THRASHER (1)
BROWN-HEADED COWBIRD (5)	BUFFLEHEAD (5)
CALIFORNIA GULL (6)	CANADA GOOSE (8)
CANVASBACK (13)	CHESTNUT-COLLARED LONGSPUR (11)
CINNAMON TEAL (1)	CLAY-COLORED SPARROW (3)
CLIFF SWALLOW** (N/A)	COMMON YELLOWTHROAT (21)
COOPER'S HAWK** (N/A)	DOUBLE-CRESTED CORMORANT (7)
DOWNY WOODPECKER** (N/A)	EARED GREBE (1)
EASTERN KINGBIRD (11)	EUROPEAN STARLING** (N/A)
FERRUGINOUS HAWK (2)	FORSTER'S TERN (4)
GADWALL (20)	GREAT HORNED OWL** (N/A)
GREEN-WINGED TEAL (2)	GREY PARTRIDGE** (N/A)
HAIRY WOODPECKER** (N/A)	HORNED GREBE (1)
HORNED LARK (37)	HOUSE SPARROW** (N/A)
KILLDEER (28)	LEAST FLYCATCHER (1)
LESSER SCAUP (7)	LINCOLN'S SPARROW (1)
LOGGERHEAD SHRIKE (1)	LONG-BILLED CURLEW (1)
MALLARD (39)	MARBLED GODWIT (2)
MARSH WREN (12)	NORTHERN HARRIER (5)
NORTHERN SHOVELER (8)	PIED-BILLED GREBE (2)
PRARIE FALCON** (N/A)	RED TAILED HAWK** (N/A)
RED-BREASTED NUTHATCH** (N/A)	RED-NECKED GREBE (7)
RED-WINGED BLACKBIRD (40)	REDHEAD (3)
RING-BILLED GULL (8)	RING-NECKED PHEASANT**(N/A)

RING-NECKED DUCK (3)	RUDDY DUCK (7)
SAVANNAH SPARROW (129)	SEMIPALMATED PLOVER (2)
SHORT EARED OWL** (N/A)	SOLITARY SANDPIPER (2)
SORA (4)	SPOTTED SANDPIPER (1)
SPRAGUE'S PIPIT (22)	SWAINSON'S HAWK (4)
TREE SWALLOW (5)	UPLAND SANDPIPER (2)
VESPER SPARROW (28)	WESTERN MEADOWLARK (75)
WHITE-FACED IBIS (5)	WILLET (15)
WILSON'S PHALAROPE (13)	WILSON'S SNIPE (11)
YELLOW WARBLER** (N/A)	YELLOW-HEADED BLACKBIRD (28)

Sensitive

Sensitive and Special Concern

At risk

** Indicates sighting from the ranch managers knowledge 2019

(#) Indicates the approximate amount of a species recorded during surveys

4.2 Mammalian Species

Fourteen (14) different species of mammals were recorded during surveys on the property (Table 2). American badger and Pronghorn are considered to be Sensitive with American badgers being Data Deficient (Government of Alberta 2017). Beaver and Muskrat are semi-aquatic and depend on wetland environments. The most frequently seen mammal on Antelope Creek was the Richardson's ground squirrel. Pasture One (1) had the most abundance of Richardson's ground squirrels.

Table 2. Number of Mammal Species Recorded on Antelope Creek Ranch in 2019

Badger**(N/A)	Beaver** (N/A)
Coyote (4)	Mouse Spp.** (N/A)
Mule Deer (3)	Muskrat** (N/A)
Pronghorn (3)	Raccoon (1)
Red fox** (N/A)	Richardson's Ground Squirrel (37)
Skunk** (N/A)	Vole spp.** (N/A)
White tailed-deer (1)	White tailed-jack rabbit (1)

Sensitive

Sensitive and Special Concern

At risk

** Indicates sighting from the ranch managers knowledge 2019

(#) Indicate the approximate amount of a species recorded during surveys

4.3 Amphibian and Reptile Species

Two Secure species of amphibians were recorded during surveys on Antelope Creek Ranch in Pastures One (1) and Four (4) (Table 3). Both of these species require wetland environments for reproduction and survival. Young of the year and egg masses were observed for boreal chorus frog in pasture Four (4). No plains spade-foot toads were located or heard during the survey however, conditions were dry and unfavorable for them. They were previously recorded in 2007 (**Figure 8.** In appendix) (Carpenter and Nicholson 2008). No specific survey was done for reptiles on the property, however, two Sensitive reptile species were recorded by the ranch manager. Both species will utilize wetland and upland habitats.

Table 3. Number of Amphibian and Reptile Species Recorded on Antelope Creek Ranch in 2019

Boreal Chorus Frog (12)	Plains garter snake** (N/A)
Tiger Salamander** (N/A)	Wandering garter snake** (N/A)

Sensitive

Sensitive and Special Concern

At risk

** Indicates sighting from the ranch managers knowledge 2019

(#) Indicates the approximate amount of a species recorded during surveys

5 Discussion and Recommendations

5.1 Avian Species

The presence of Ferruginous Hawk and Chestnut-collared Longspur, two At Risk species on the property, further demonstrates the importance of areas such as Antelope Creek Ranch. The island of intact habitat amongst agricultural fields acts as a refuge for the eighty- eight (88) different

bird species found on the property. Several of these species require intact native grasslands with heterogeneity that provides a mixture of grass species and heights to carry out their life cycle. Antelope Creek Ranch can provide nesting, breeding, wintering and foraging habitat for many species of birds. A previous study on Antelope Creek Ranch in 2007, observed seventy-two (72) bird species. Twenty-two (22) of the species recorded were considered Sensitive in the 2007 study. Sensitive species recorded during the 2007 study that were not recorded during the 2019 study included: Grasshopper sparrow, Lesser scaup, Long-billed curlew, Northern pintail, Virginia rail and Yellow rail. During the 2007 study Chestnut-collared longspur were recorded but considered secure at that time, no Ferruginous hawks were recorded during the 2007 study (Carpenter and Nicholson 2008). The 2019 study is the first recording of Ferruginous hawks on Antelope Creek Ranch.

5.1.1 Avian Species-Specific Recommendations

The continuation of the current grazing management plan is critical to maintaining a healthy population of avian species on the property. 2019 surveys saw an increase in the diversity of bird species from the 2007 report. This shows the current management is beneficial for bird species. The current system of rangeland health monitoring and annual clipping provides a robust measure and should be continued. This will ensure habitat is provided to a variety of species such as Chestnut-collared Longspurs. They are a species that prefers to breed in recently grazed or mowed arid short or -mixed-grass prairie. The species prefers short vegetation (<20-30 cm high). They will also breed in tall-grass prairie if it is grazed or mowed (COSEWIC 2009). The current grazing management provides a mosaic with some areas that provide this habitat requirement. The presence of Ferruginous hawks is suggestive of potential foraging use on the property by them. With the large amount of Richardson's ground squirrel and absence of burrowing owl (last reported in 1993) there may be an opportunity to install a hawk nesting pole in key areas which are away from historic burrowing owl sightings. This is suggested as there is limited nesting spots available on the property with one of the main tree nesting sites already occupied by a red-tailed hawk. Further surveys would have to take place to ensure the proper placing of a hawk nesting pole site(s).

Duck species, heron species, and sora rail utilize this property for breeding, brood raising and foraging. The continuation of management and filling of man-made wetlands on the property is critical to provide habitat and foraging opportunities for these species, and provide a water source for all other avian species on the property. In a landscape where water is hard to find during drought years such as 2019 the water sources Antelope Creek Ranch provides are highly beneficial for many species. Due to the natural lack of tree species and other shade providing features cattle were on occasion observed using riparian area vegetation such as cattails as a source of shade. A possible strategy to encourage cattle to move out of riparian areas could be the planting of cotton wood or other native tree species. If planted the trees would require a fence guard to ensure cattle do not cause damage to the seedlings and enable them to mature to large shade and habitat producing trees. The high-water table of the area will support trees if they are provided the opportunity to mature.

The abundance of riparian areas on Antelope Creek Ranch would not be conducive to the addition of offsite watering units, however, if certain wetlands are obtaining damage in concentrated areas the use of offsite watering might be considered. Further research performed by a riparian specialist would better inform whether there is need for this management strategy and assists in determining location(s). Avian species found on the ranch are often flying in and out of wetland areas. Some wetlands on Antelope Creek Ranch have fencing through or near the edges, to ensure waterfowl and other species do not hit fence lines, visible reflective markers could be placed on these fence line wires.

Overall the management of Antelope Creek Ranch is exemplary for avian species and should be viewed as a prime example of a balance between a functioning oil and gas industry, cattle ranch and wildlife refuge.

5.2 Mammalian Species

Pronghorn are a Sensitive species and a staple species for the Alberta prairies. Antelope Creek Ranch provides highly quality summer and winter foraging for this species. As an island among

agricultural land, it provides important cover and habitat. The area also allows for the raising of young.

Antelope Creek Ranch also provides prime habitat for the American badger. Viewed as a pest by many, this species is not hunted or viewed poorly on the ranch. The high population of Richardson's ground squirrel provides soft tunnels for badgers to dig in. Ranch Manager Neal Wilson expressed the need for Badgers in aiding with soil health (Personal Communication 2019).

5.2.1 Mammalian Species Specific Recommendations

Antelope Creek Ranch's fencing is exceptional for wildlife as it is constructed with wildlife movement in mind. With a smooth wire bottom and 18 inches from the ground it provides a low impact fencing while still containing cattle while allowing for ungulate movement. The grazing management, allows, for even in drought years, enough forage for wildlife in the winter to utilize. The strategy of placing salt blocks and mineral in under grazed sites seems to be effective in ensuring a more even graze of the pastures and addresses one of the main principles of range management- to distribute livestock evenly.

There are four main rangeland principles which state that to foster healthy, productive rangeland there should be 1) balancing of livestock demands with the available forage supply; where forage is harvested to sustain livestock but adequate ungrazed residue is left to sustain rangeland function, 2) livestock distribution should be promoted with fencing, salt placement, water development and other tools, 3) grazing should be avoided during vulnerable periods such as early spring and 4) effective rest periods should be provided to allow range plants to recover (Government of Alberta 2017). As previously, mentioned the addition of cotton woods could provide habitat and shade for many species including bats. Currently, the lack of natural roost habitat makes it unlikely that bat species are staying on the property. No specific effort was made to survey bats in 2019 however, there is potential that bat species could forage over Antelope Creek Ranch's wetlands with abundant invertebrates. The current management of cattle by ranch manager follows the four principles of range management and there are no suggestions for this site as the management for mammalian specie is ideal.

5.3 Amphibian and Reptile Species

The amphibian population was lower than expected due to the high number of wetlands and habitat provided at Antelope Creek Ranch. Populations that were located during surveys showed that amphibians were only present in the vein of wetlands between pastures 4 and 1. Pastures 2, 3 and Cassils had no amphibians present during surveys. Plains spadefoot toad were not present during surveys. They were present in riparian areas on the ranch in 2007 (Carpenter and Nicholson 2008). Ephemeral wetlands such as the canal overflows present on the ranch are vital to provide breeding habitat for plains spadefoot toad. Plains spadefoot toad will live only temporarily in these wetlands, most of their time is spent living underground and they only come out to mate and feed in wet years. Because of this lifecycle requirement plains spadefoot may not have been noted due to the fact that it was an unusually dry year. With that in mind surveys should be undertaken again in a wet year, as the habitat is still present and there is a possibility this species is still present, but conditions were not conducive to monitoring.

It is unlikely that ranch cattle management is negatively affecting amphibian populations, but lack of amphibians could be due to the large number of avian predators present such as Black-crowned night herons, Great blue-herons and duck species. 2019 drought conditions could also be a contributing factor to low amounts of amphibians observed during surveys. Reptiles also likely suffer from a large amount of predation however further research is required to determine the reptile population. It is speculated that the absence of species such as Prairie rattlesnakes and Bull snakes can be attributed to a few key features on Antelope Creek Ranch. The lack of natural habitat such as coulees and rock faces nearby are one attributing fact. Another is the impacts of the high level of anthropogenic activity surrounding Antelope Creek Ranch. These species do not do well in areas with high densities of roads, high amounts of habitat fragmentation or degradation and areas with more intensive land use such as annual cropping, or even haying such as the area surrounding Antelope Creek Ranch. The tolerance of Richardson's Ground Squirrels and American Badgers on Antelope Creek Ranch is a beneficial management practice that is suggested by MUTISAR as they are an important food and burrow source for reptiles and create potential nesting sites for burrowing owls.

5.3.1 Amphibian and Reptile Species Specific Recommendations

Amphibian and Reptile populations are present on Antelope Creek Ranch, with a breeding population of amphibians. One possible adjustment would be the addition of cotton wood plantings upland of areas were cattle are entering wetlands, away from the wetland area itself. This could prevent cattle from entering riparian areas for shade and mitigate/reduce potential damage to riparian areas. At this time the managed rotation of cattle from pasture to pasture has prevented any damage to the majority of wetland areas.

5.4 Conclusion

The main objective of this report was to provide information to the land owner on some of the detectable species present on their property and suggestions of potential management changes through incorporation of beneficial management practices to enhance wildlife habitat.

Current rangeland management plans and implantation of all principles of range management on Antelope Creek Ranch, promotes heterogeneity and provides wildlife habitat, while preventing riparian damage. These practices may have helped to create more available habitat for wildlife species. Since 2007, we are now seeing an, increase in species diversity. Proposed management changes outlined in this report were the integration of planted cotton woods on to the property, erection of hawk nesting poles, riparian monitoring with possible offsite watering unit employment and placement of visible reflective markers on fencing crossing wetlands or near fly ways in and out of wetlands.

The knowledge of what species are currently using the property will help in determining land management plans and give direction to what beneficial management practices could be useful to reference. Antelope Creek Ranch has a high diversity of wildlife including a variety of avian, mammalian, reptile, and amphibian species utilizing its many diverse habitats.

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7 Appendix

Table 4. 2019 Precipitation Totals and Historic Precipitation Averages-for Brooks, Alberta

Month	2019 Precipitation (mm) for Brooks, AB	Historic average precipitation(mm) for Brooks, AB	Difference (mm)
May	7.2	36	-28.8
June	26.3	57	-30.7
July	46.7	43	3.7
August	23.9	43	-19.1

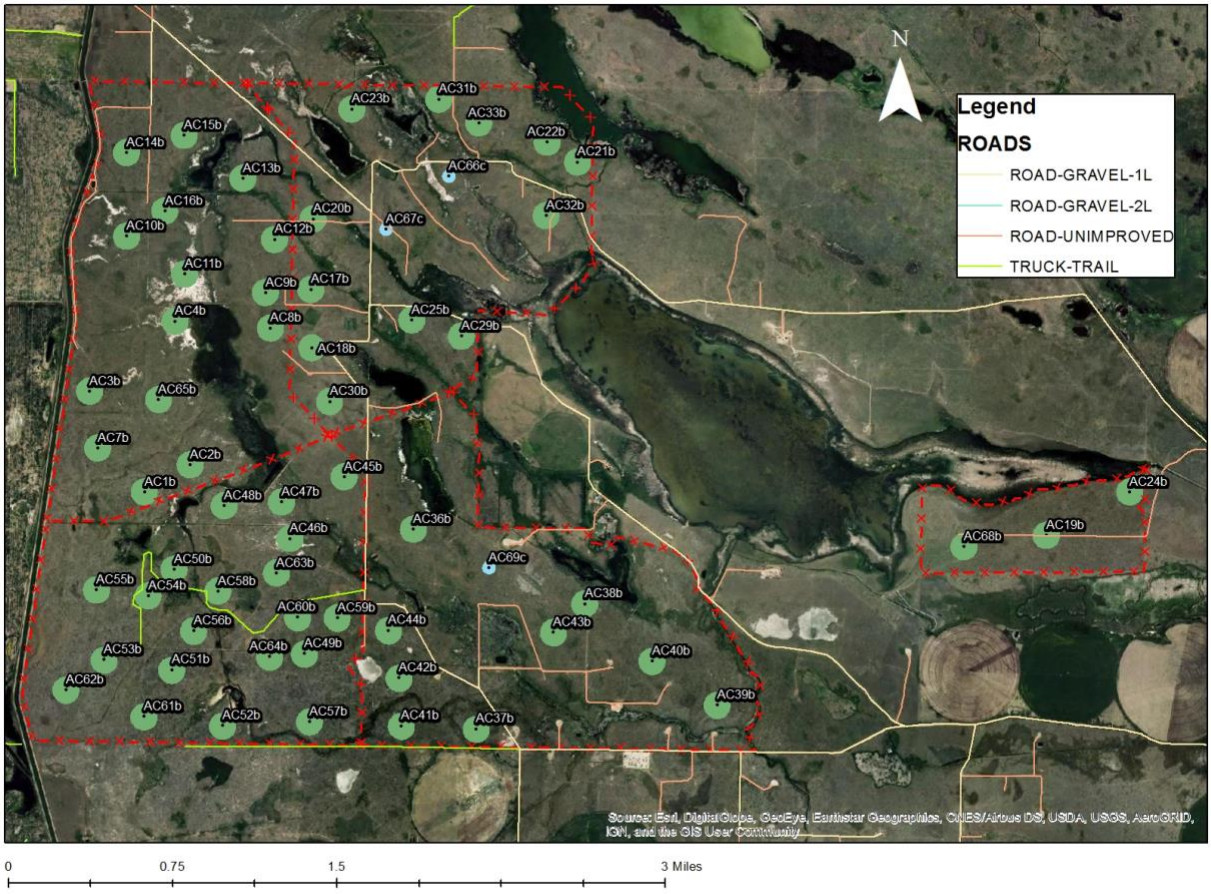

Figure 2. Map Locations of Point Count Surveys on Antelope Creek Ranch

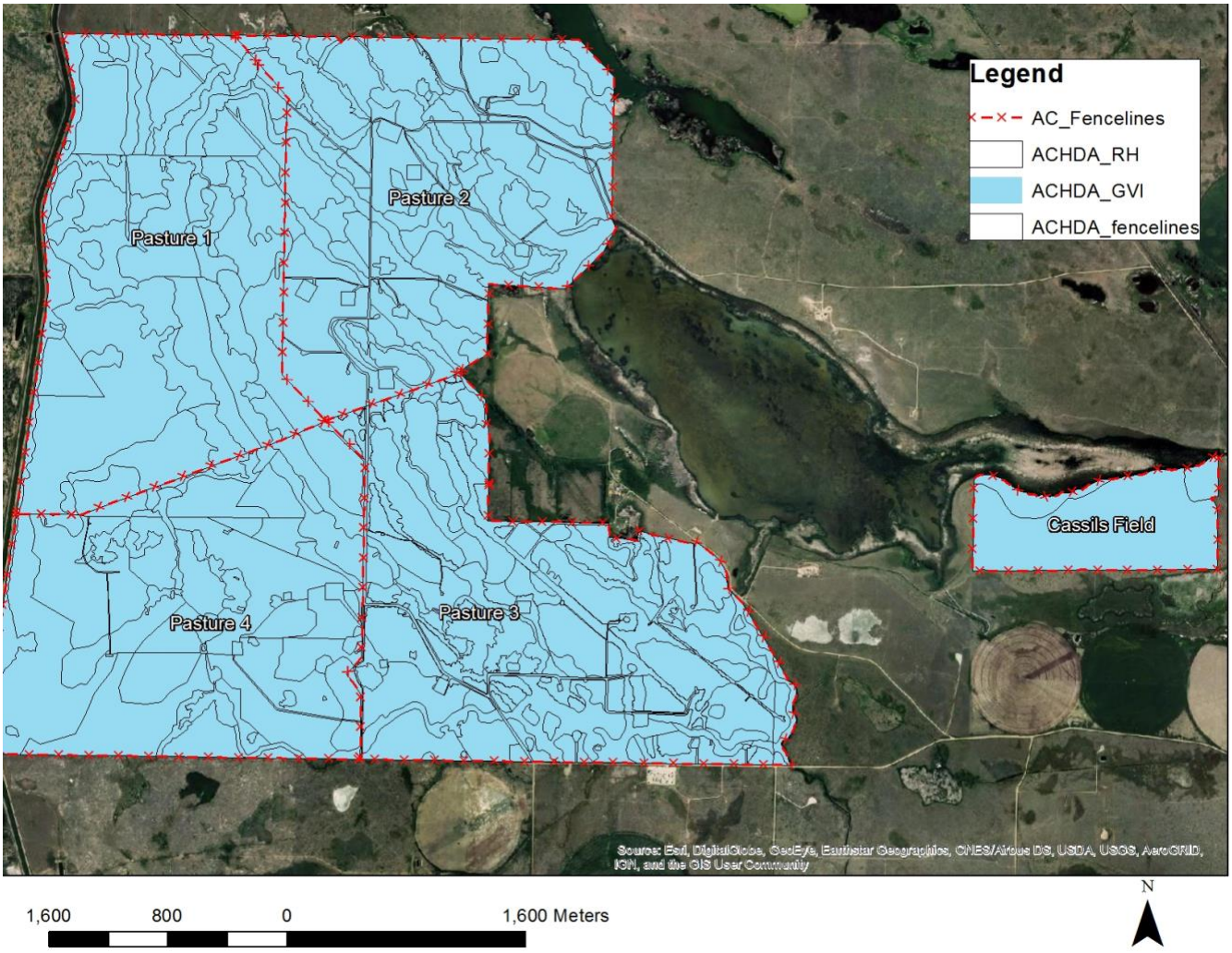

Figure 3. GVI data on Antelope Creek Ranch

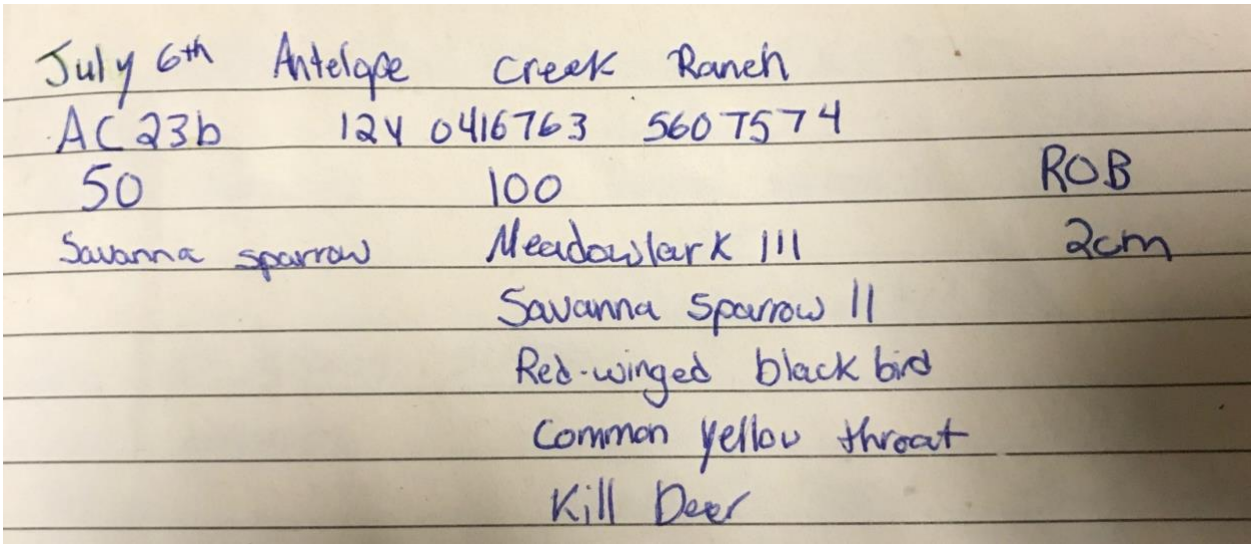

Figure 4.Example of Point Count Data Collected

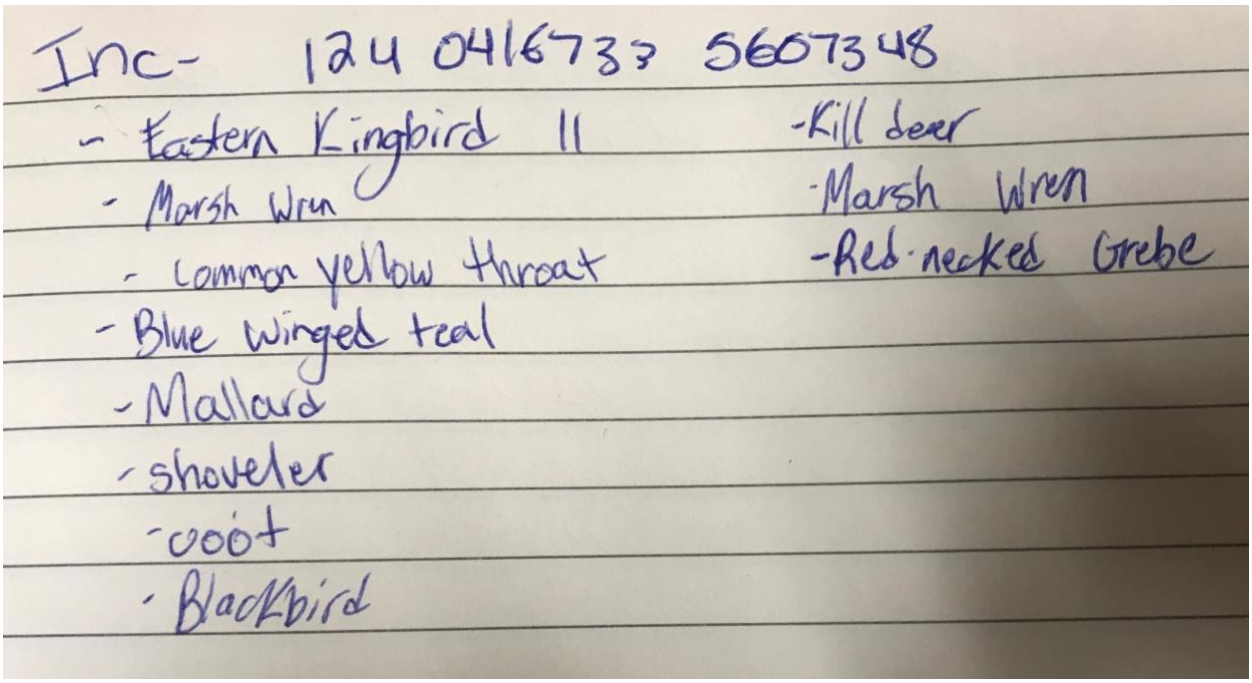

Figure 5. Example of Incidental Observation Data

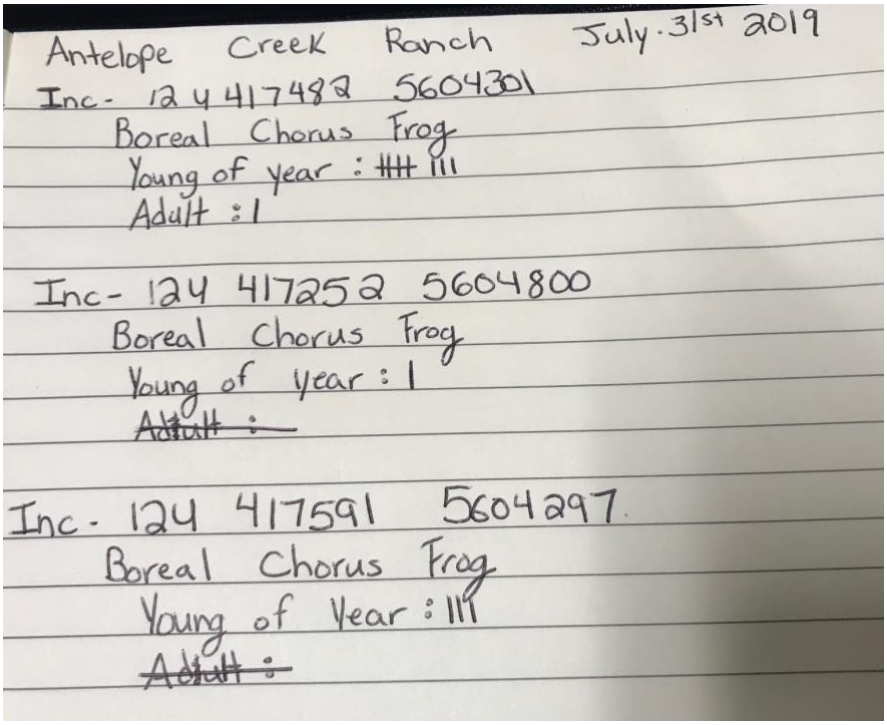

Figure 6. Example of Amphibian Incidental Observation Data Collected

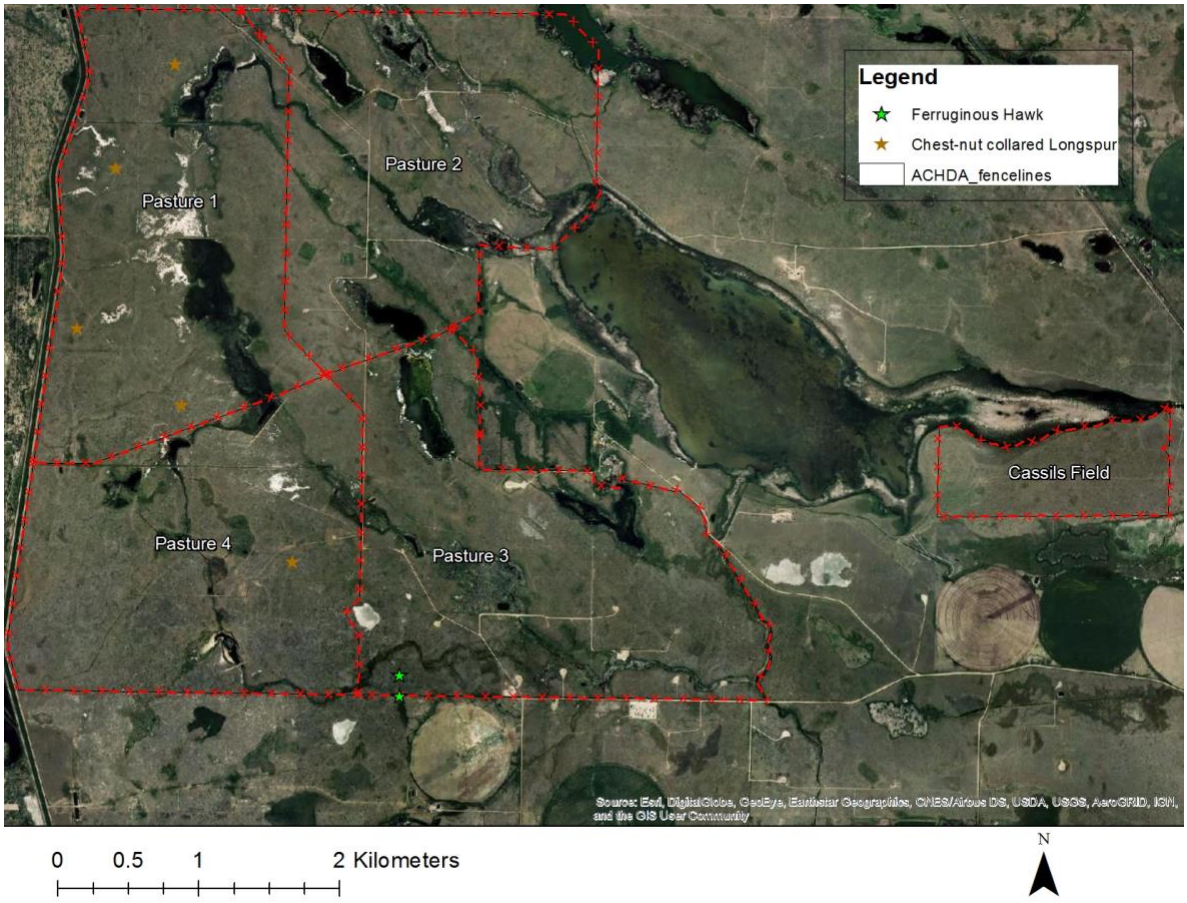

Figure 7. Species at Risk locations on Antelope Creek Ranch 2019

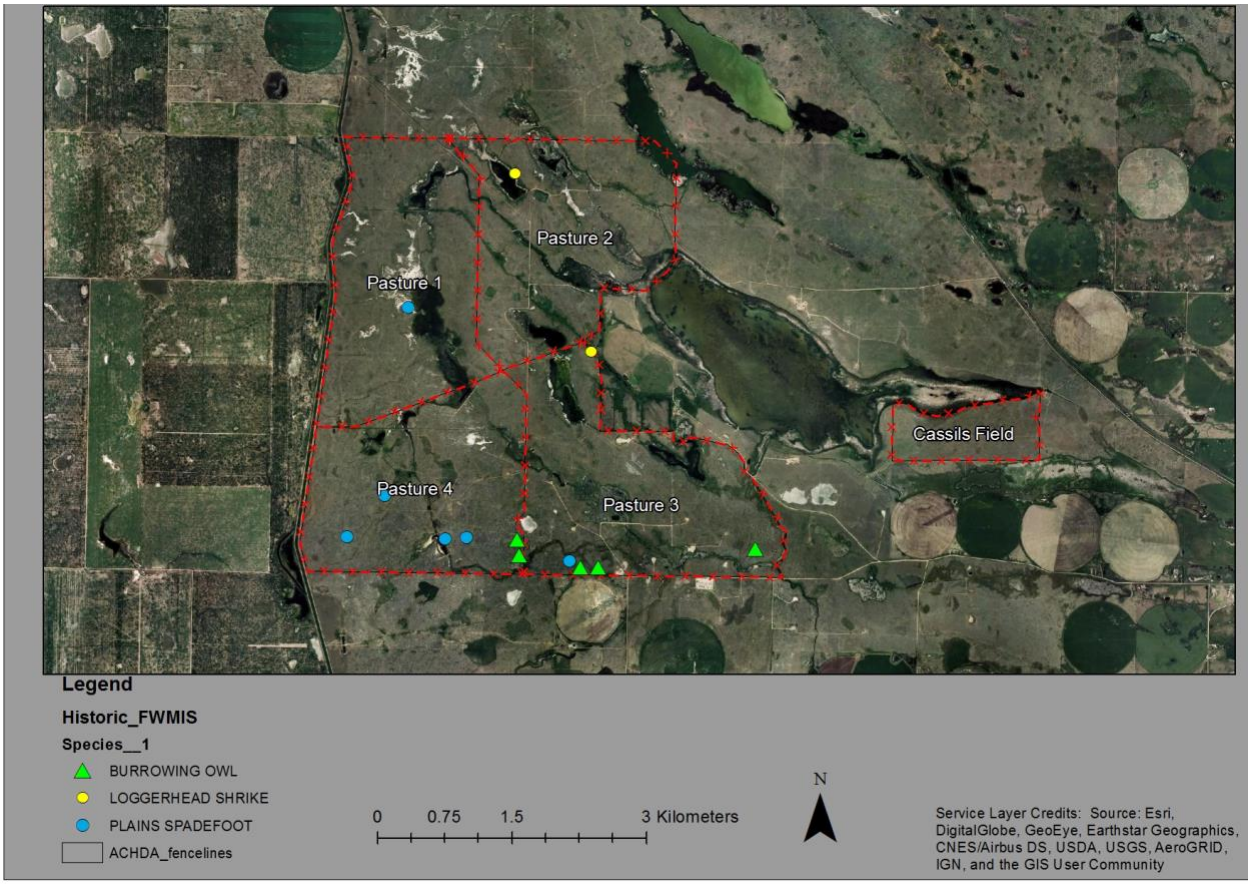

Figure 8. Historic FWMIS data on Antelope Creek Ranch