

# Evaluating Streaked Horned Lark Habitat Creation and Population Response at Herbert Farm



2015

Annual Report to US Fish and Wildlife Service;  
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Report prepared by Peter Moore  
*Institute for Applied Ecology*



## PREFACE

IAE is a non-profit organization whose mission is conservation of native ecosystems through restoration, research and education. IAE provides services to public and private agencies and individuals through development and communication of information on ecosystems, species, and effective management strategies. Restoration of habitats, with a concentration on rare and invasive species, is a primary focus. IAE conducts its work through partnerships with a diverse group of agencies, organizations and the private sector. IAE aims to link its community with native habitats through education and outreach.



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**Cover photographs:** Streaked horned lark at Herbert Farm (Peter Moore, July 2015)

## SUGGESTED CITATION

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## 1. INTRODUCTION

Creating habitat for streaked horned lark (*Eremophila alpestris strigata*) on working agricultural lands and restored prairies is critical to any efforts to recover this imperiled bird species. The streaked horned lark was federally listed as Threatened in 2013 due to its declining numbers and shrinking range. Approximately 80% of the lark population occurs in the Willamette Valley and >70% of those birds occur on agricultural lands. Lark conservation on agricultural lands requires knowledge of specific actions and associated costs that can be promoted to landowners either voluntarily or through economic incentive programs. Additionally, the extensive efforts by numerous agencies and non-governmental organizations to restore both wet and upland prairie habitat from former agricultural lands lack suitable techniques for creating streaked horned lark habitat.

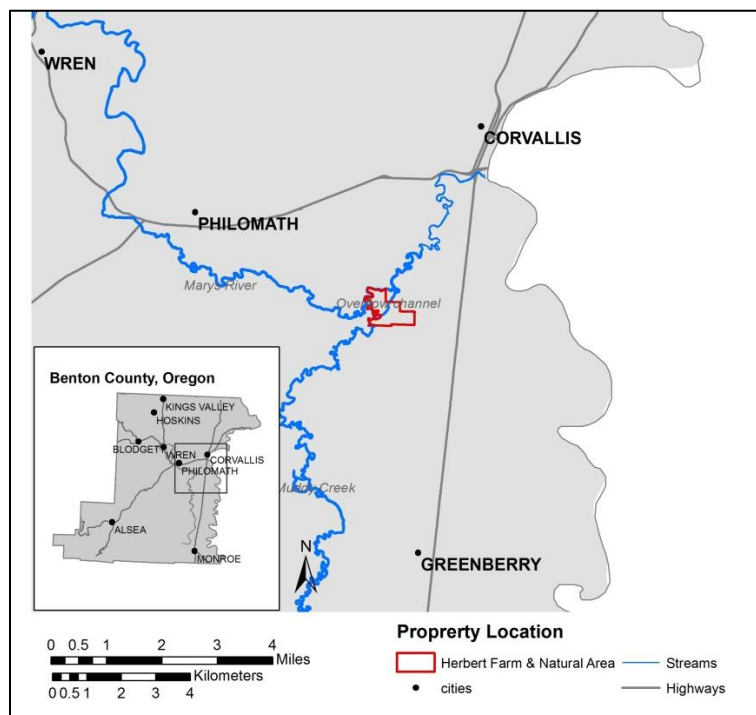
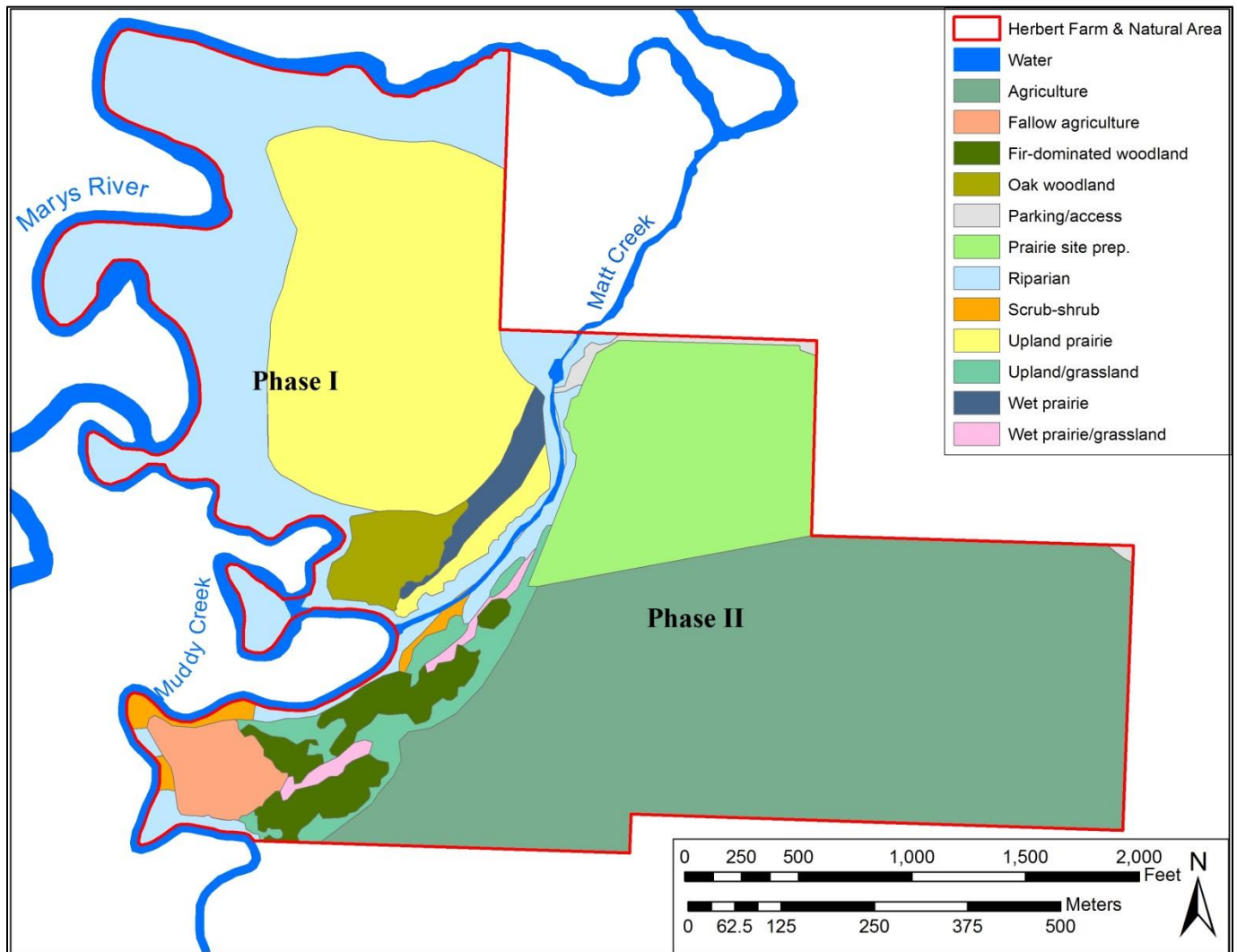


Figure 1. Location of Herbert Farm

The Herbert Farm and Natural Area (Fig. 1) is a 221 acre property, located just south of Corvallis, Oregon, owned by the City of Corvallis, with a conservation easement held by Oregon Department of Fish and Wildlife (ODFW) and Bonneville Power Administration (BPA). The property offers a unique opportunity to evaluate the creation of lark habitat since there is active prairie restoration underway (IAE 2013), and there are working agricultural lands on, and surrounding, the property (Figs. 2, 3). Furthermore, larks have been recorded at Herbert Farm, which is less than one mile from the large lark population at the Corvallis Municipal Airport. Known hot-spots at Herbert Farm include a large seasonally inundated swale on the eastern part of the property (R. Moore, OSU, pers. comm. 2015) and along Herbert Avenue, where two nests have been recorded (City of Corvallis 2011: map 2.14).



**Figure 2.** Current habitats at Herbert Farm

Discussions among agency, non-governmental biologists, and private landowners indicated that expansion of the marginal strip of sparse vegetation between roads and agricultural fields, especially grass seed fields, has the greatest potential to increase lark habitat within working agricultural lands. This non-production area, approximately 3 meters in width, and including the roadside ditch, is regularly sprayed with herbicides to prevent contamination of fields by weeds. This also is an area where some larks previously have nested at Herbert Farm.

The Institute for Applied Ecology was awarded funds by US Fish and Wildlife Service (USFWS) in August 2014 to compare methods of creating streaked horned lark habitat at Herbert Farm. The grant agreement #F14AP00668 award is from USFWS's Fish and Wildlife Service's Endangered Species Conservation – Recovery Implementation Funds.

This project will test and compare three treatments, designed to suppress vegetation establishment and increase the amount of bare ground and sparse vegetation, in order to create more favorable lark habitat.

## 2. GOALS AND OBJECTIVES

The goal of this project is to compare three cost-effective techniques for creating streaked horned lark habitat along roadsides.

This project has two primary objectives:

- 1) implement multiple management techniques that create lark habitat in association with working agricultural lands and prairie restoration of former agricultural lands; and
- 2) monitor and evaluate the response of an existing nesting lark population.

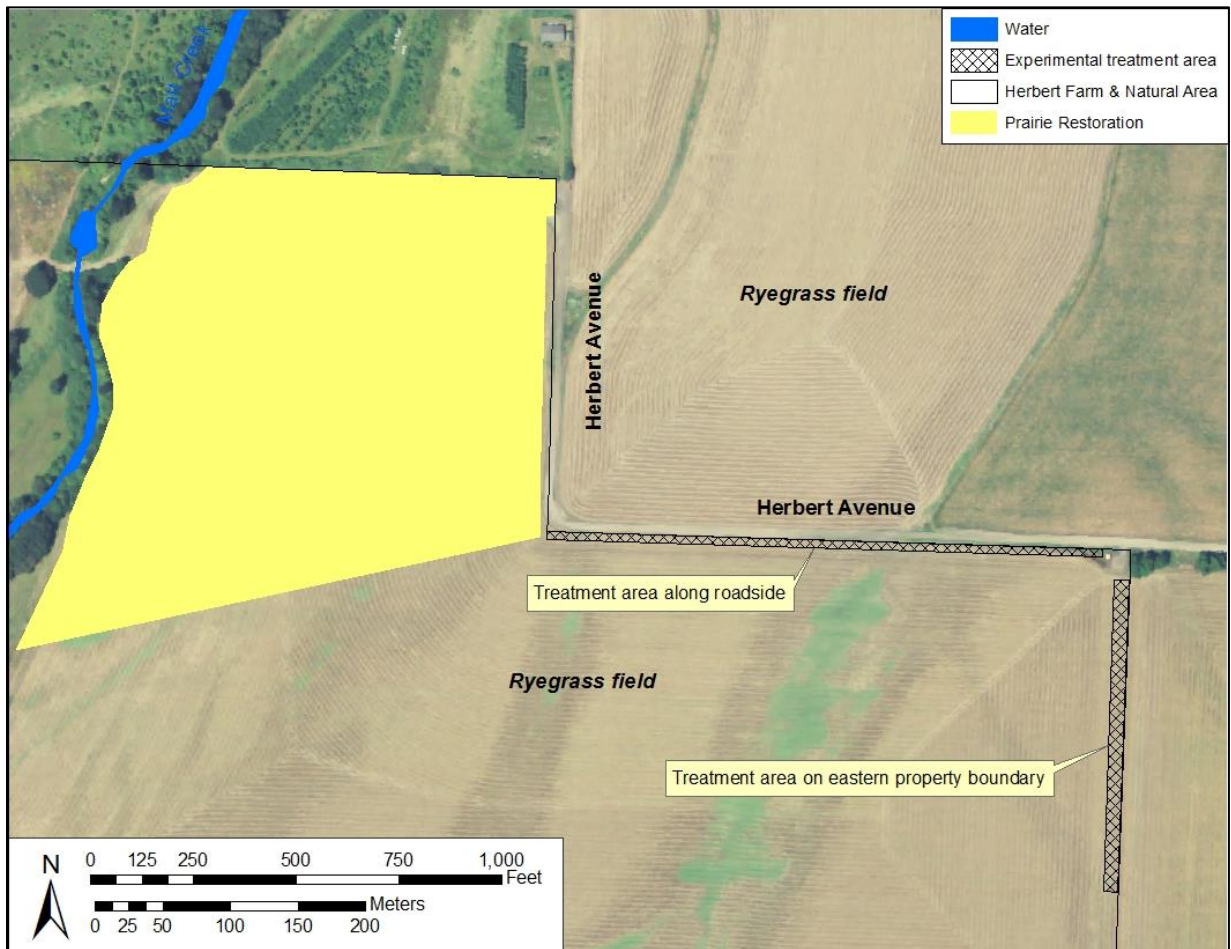
## 3. METHODS

### 3.1. Experimental Treatments

The experimental treatment area is approximately 600 m long x 6m wide at the field edge along Herbert Avenue and the eastern property boundary of Herbert Farm (Fig. 3).

The treatments include:

- 1) Herbicide – Apply broad-spectrum herbicide 1-2 times per year to promote bare ground and sparse vegetation for nesting larks.
- 2) Disk + Herbicide – Disk in fall followed by broad-spectrum herbicide treatment in spring.
- 3) Disk and Mow – Disk twice in fall and mowing the following spring.



**Figure 3.** Location of streaked horned lark experimental treatment areas at Herbert Farm

The three treatments were chosen for their applicability to common farming practices and their ability to suppress vegetation establishment and growth, and increase the amount of bare ground and sparse vegetation. Other treatments such as gravel and mulch were considered but rejected because of the high cost per unit length and the long-term effect on the treatment area.

The width of the treatment areas are approximately 6 meters (18 feet), and the three treatments occur in approximately 100 meter lengths (2 sections of each treatment type).

The treatment schedule is provided in Table 1.



**Table 1.** Treatment schedule

	Treatment 1	Treatment 2	Treatment 3
<b>October 2015</b>		Disk	Disk
<b>November 2015</b>	Herbicide		Disk
<b>March-May 2016</b>	Herbicide	Herbicide	Mow
<b>October 2016</b>		Disk	Disk
<b>November 2016</b>	Herbicide		Disk
<b>March-May 2017</b>	Herbicide	Herbicide	Mow

### 3.2. Monitoring

The project will include monitoring during two years of pre-treatment (Spring-Summer 2014 and 2015) and two years post-treatment (Spring-Summer 2016 and 2017). Monitoring will include:

1. **Transects:** Transect surveys through the prairie restoration and agricultural field will be conducted during three visits, equally spaced through May-June of each year. The surveys, conducted by Bob Altman (American Bird Conservancy/Avifauna Northwest) and Randy Moore (OSU), will provide indices of abundance and density estimates for the site.
2. **Lark searches:** Lark-specific area searches will be conducted by an Oregon State University seasonal field technician with the objective of locating and counting nesting pairs throughout the treatment area as well as the entire Herbert Farm. There will be a minimum of six visits per year to determine if nesting is occurring. If larks are nesting, each nest will be monitored every few days throughout the breeding season to determine the outcome of the breeding attempt.

Effectiveness monitoring will be conducted bi-annually (Spring and Fall) each year and tracked using photopoints (at least 6) to illustrate changes in the treatment area. Landscape and close-up photos will be taken at each point in each of the four cardinal directions to visually monitor habitat conditions.

## 4. RESULTS

### 4.1. Experimental Treatments

Treatments began in November 2015, although the initial disking, scheduled for October for Treatments 2 and 3, had already been done by the farmer as part of crop preparation (see Section 7 for explanation on deferred start date).

City of Corvallis marked out the overall treatment area in early November, and the plots were marked by IAE staff on 11/8/15, with treatments randomly assigned to the six 100m long plots.

Rodeo (glyphosate) herbicide was applied in two plots (Treatment 1A and 1B) on 11/12/15. The herbicide was applied by a contractor (Habitat Restoration, LLC) at a rate of 0.5 gallons per acre, along with MSO surfactant at 0.25 gallons per acre.

A disk was not available in November (see Section 7), so this treatment was completed by Shawn Woods (ODFW) with a harrow towed behind an ATV on 11/11/15. Both Treatments 2 and 3 were harrowed in order to disrupt the growth of the ryegrass that had been sown after plowing by the farmer.

## 4.2. Monitoring

Bob Altman conducted monitoring of larks at Herbert Farm in the summers of 2014 and 2015 (Altman 2015, Appendix A). No larks were detected in the pre-treatment experimental plots, or other adjacent parts of Herbert Farm, however, birds were detected in the Phase I restoration area (Fig. 2) during both years (Altman 2015, Appendix A).

## 5. DISCUSSION

Pre-treatment conditions and the beginning of the experimental treatments were successfully completed in 2015.

Although no larks were recorded in the vicinity of the experimental areas, it noteworthy that larks were attracted to the Phase I restoration areas in the western half of Herbert Farm. Two years of herbicide treatments as part of site preparation for a 36 acre prairie had created bare ground, and a pair of larks was observed in this area in 2014. Seeding with native prairie species in fall of 2014 resulted in patchy sparse vegetation and bare ground, which attracted a pair of larks during summer of 2015.

## 6. CONCLUSIONS

At this beginning stage of the experiment, it is too early to form conclusions about treatments.

## 7. DIFFERENCES FROM ORIGINAL PROPOSAL

Differences from the original proposal include:

- The start of the project had to be deferred by one year, as a cultural resources survey was required by BPA before any ground disturbing activities, including the disking in this project, were allowed at Herbert Farm. An extension to this project contract will be required to complete the experiment during 2017. IAE will request this extension during 2016.
- City of Corvallis had not renewed and modified the farmer's lease at Herbert Farm by October 2015, so the farmer had ploughed, rolled and sown a new crop by that stage. Consequently, all three treatments had a disking treatment in late summer.
- The second disking treatment was planned to be conducted by ODFW during November, but as disking equipment and an operator were not available at that time, the disk plots were instead treated with a harrow towed behind an ATV.

- The original proposal planned for all treatments to be along Herbert Avenue. However, once prairie restoration began alongside the northern section of road during 2015, the project partners felt that it would confound the experiment to have experimental plots adjacent to a larger field that had been treated with herbicides. As a result, two treatment plots were moved to the eastern property boundary, so that all six treatment plots would be adjacent to ryegrass fields (Fig. 3). A 6m wide boundary strip was sprayed with herbicide in November 2015 to create the equivalent to a roadway beside the experimental plots.

## LITERATURE CITED

- Altman, B. 2015. Herbert Farm Streaked Horned Lark Inventory, 2014-2015. Prepared for Institute for Applied Ecology, Avifauna Northwest, August 2015.
- City of Corvallis. 2011. Herbert Farm and Natural Area Management Plan. Parks and Recreation Department. 135 pp.
- Institute for Applied Ecology. 2013. Herbert Farm and Natural Area Restoration Plan. Prepared for the City of Corvallis and Oregon Department of Fish and Wildlife. 45pp. plus appendices.

APPENDIX A. STREAKED HORNED LARK MONITORING REPORT

**Herbert Farm Streaked Horned Lark Inventory, 2014-2015**



Photo: Peter Moore

**Prepared for  
Institute for Applied Ecology**

**Bob Altman  
Avifauna Northwest  
August, 2015**

## Introduction

Streaked Horned Lark surveys were conducted during the 2014 and 2015 breeding seasons at Herbert Farm and Natural Area, south of Corvallis, Oregon. This 221-acre property is owned and managed by the City of Corvallis. The Oregon Department of Fish and Wildlife holds a conservation easement that protects the conservation values of the property, and the Institute for Applied Ecology (IAE) has been contracted to develop a management plan and conduct restoration and management activities. The property is less than one mile from a large lark population at the Corvallis Municipal Airport.

## Objective

The objective was to conduct an inventory of the property to provide pre-treatment data on lark population size that will be the baseline for an analysis of changes resulting from habitat restoration and management under the U.S. Fish and Wildlife Service contract for *Evaluating Streaked Horned Lark Habitat Creation and Population Response at Herbert Farm*.

The project was designed to test and compare three treatments to suppress vegetation establishment and growth, and increase the amount of bare ground and sparse vegetation within an approximately 600 meter length of field edge along Herbert Avenue. The width of the treatment area is approximately 6 meters (18 feet), and the three treatments will occur in approximately 100 meter lengths (two sections of each treatment type). The three treatments will occur in fall 2015 through spring 2016 and include:

- Herbicides – Apply broad-spectrum herbicide 1-2 times per year.
- Disk and Herbicide – Disk in fall followed by broad-spectrum herbicide treatment in spring.
- Disk and Mow – Disk twice in fall and mowing the following spring.

## Methods

Herbert Farm was visited 31 times during the two breeding seasons (13 in 2014 and 18 in 2015). In May 2014, visits were limited to the approximately 120 acres of road and grass fields east of Matt Creek where the aforementioned habitat restoration will occur. In early June, 2014, IAE staff located a lark in the approximately 60 acre prairie restoration field west of Matt Creek, and from that point on both areas were surveyed on all visits. Survey methodology was an area search in which the surveyor walked through potential habitat looking and listening for larks. Effort was variable among visits, ranging from 20 minutes to 1.5 hours, with most visits in the 40-50 minute range.

## Results

**2014:** There were four visits in May, four in June, three in July, and two in early August. No larks were ever heard or seen on the road or in the grass fields east of Matt Creek during any visit. An unbanded pair was detected in the restoration field west of Matt Creek on three of the four visits in June and two of the three visits in July. No larks were detected in the early August visits. Neither bird was banded. The male was observed singing from both the air and on the ground on multiple visits. On June 19, the pair was observed uninterruptedly for approximately one hour with no indication of nesting behavior.

**2015:** There were four visits in May, five in June, eight in July and one in early August (Table 1). No larks were ever heard or seen on the road or in the grass fields east of Matt Creek during any visit. In the restoration field west of Matt Creek, no larks were detected in May or June. However, on July 2, IAE staff observed a banded male, and a pair was detected on July 4 when the band combination of the male was confirmed. The description was green over metal on the left leg, and black over yellow on the right leg. This male had been banded at the Corvallis Airport in summer 2012 as a nestling, and had been seen once subsequently at the airport in November 2014. The female was unbanded.

## Discussion

The absence of larks in both years along the road or in the grass fields east of Matt Creek was unexpected given their history of use of that area. However, in 2014 the large lark population at Corvallis Airport, which likely provided surplus birds for Herbert Farm, declined by over 60%. Further, the field west of Matt Creek became suitable habitat for larks in 2014 because the spray-out for prairie restoration resulted in significant bare and sparsely vegetated ground. The pair of birds in this field in both years may have been attracted from the traditional area east of Matt Creek.

Nesting likely occurred in both years in the prairie restoration field west of Matt Creek, although no nest was located and no fledged young were ever seen. The likelihood of nesting is based on the overall length of time a pair was present during both years, regular singing on many visits by the male from the air and ground (i.e., territoriality), and on most visits seeing the pair together throughout most of the breeding season. Further, the appearance of a second male on one day in 2015, and the aggressive interactions between the males also supports the commitment to a territory and the site.

Not finding a nest was likely the result of unfortunate timing. For example, during a one hour visit on June 19 at the height of the nesting season, there were no nesting behaviors observed and the female was observed the entire time. This suggests the pair may have been in between nesting attempts after a failed nest. If they were nesting at that time (on site or elsewhere), one hour is likely too long a time to be away from the nest.

It is unknown if the pair in 2014 was on territory in May since the west side of Matt Creek was not visited until early June, but it is noteworthy that there was no detections of birds on the site in May or June, 2015. The initial appearance of a pair in suitable habitat in late June or early July is not unusual in the Willamette Valley. Birds nesting in agricultural fields often have nest failures with the intensification of mowing, harvesting, and plowing of fields in June. These failed nests often result in the nesting pair leaving to seek another site for a second or third breeding attempt.

In summary, a pair likely nested in the prairie restoration field west of Matt Creek each year, given the territorial behavior and the length of time present on the site each year, but they probably failed to produce young. It may have been just unfortunate timing of visits to confirm nesting. Additionally, by spending an average of less than one hour once or twice a week there is good potential to miss observations of nesting behaviors and/or finding a nest. Additional time may have resulted in greater success at confirming nesting, although failed nesting attempts are shorter in duration than successful ones.

Table 1. Summary of Streaked Horned Lark surveys at Herbert Farm, 2015.

Date	Results
5/8	No birds detected
5/11	No birds detected
5/16	No birds detected; included time of regular bird surveys east of Matt Creek
5/21	No birds detected
6/2	No birds detected; included time of regular bird surveys east of Matt Creek
6/4	No birds detected
6/16	No birds detected; included time of regular bird surveys east of Matt Creek
6/19	No birds detected
6/25	No birds detected
7/4	Male singing in sky and flushed on ground; did not see female; got band combo of male
7/5	Pair seen together; male singing
7/8	Pair seen together; second male singing in sky and some aggressive chasing by males
7/9	No birds detected
7/11	No birds detected
7/20	Male singing in sky and flushed on ground; female flushed and flew off-site to northeast
7/25	Pair seen together; male singing
7/26	Pair seen together; both flushed and flew off-site to northeast
8/2	Male singing in sky just off-site to east; female not seen

## APPENDIX B. PHOTOPOINTS



Fig. B1. Herbicide Plot 1A in June and November (pre-treatment) and December (post treatment).



Fig. B2. Herbicide Plot 1B in June and November (pre-treatment) and December (post treatment).





Fig. B3. Disk/Herbicide Plot 2A in June and November (pre-treatment) and December (after harrowing treatment).

Fig. B4. Disk/Herbicide Plot 2B in June and November (pre-treatment) and December (after harrowing treatment).



Fig. B5. Disk/Herbicide Plot 3A in June and November (pre-treatment) and December (after harrowing treatment).

Fig. B6. Disk/Herbicide Plot 3B in June and November (pre-treatment) and December (after harrowing treatment).

