

2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report



Annual Report Prepared for:

U.S. Bureau of Land Management,
Jonah Interagency Office, and Jonah
Field Operators

Prepared by:



PO Box 1704
Pinedale, WY 82941
Phone: 307.367.6824

ASTER CANYON CONSULTING, INC.

2014 JONAH INFILL DRILLING PROJECT AREA WILDLIFE MONITORING FINAL REPORT

Distribution List for Agencies, Companies, and Jonah Field Operators	Number of Copies				Draft Delivery Date	Final Delivery Date
	Final Report	Appendices	Maps			
BLM, Pinedale Field Office	2 Bound, 2 Electronic	2 Electronic	Not provided	7/31/14	11/7/2014	
JIO, Pinedale Office	2 Bound, 2 Electronic	2 Electronic	Not provided	7/31/14	11/7/2014	
WGFD, Pinedale Office	1 Bound, 1 Electronic	1 Electronic	Not provided		11/7/2014	
WGFD, Lander	1 Bound, 1 Electronic	1 Electronic	Not provided		11/7/2014	
USFWS, Cheyenne	1 Bound, 1 Electronic	1 Electronic	Not provided		11/7/2014	
LINN Operating, Inc.	2 Bound, 2 Electronic	2 Electronic	1 Plotter Set		11/7/2014	
Jonah Energy LLC/EnCana Oil & Gas (USA), Inc.	2 Bound, 2 Electronic	2 Electronic	1 Plotter Set	7/31/14	11/7/2014	
Omimex Petroleum, Inc.	1 Bound, 1 Electronic	1 Electronic	Not provided		11/7/2014	
Enterprise Products	1 Bound, 1 Electronic	1 Electronic	1 Plotter Set		11/7/2014	
Ultra Resources, Inc.	1 Bound, 1 Electronic	1 Electronic	Not provided		11/7/2014	

Suggested Citation:

Aster Canyon Consulting, Inc., 2014. 2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report. Jonah Infill Drilling Project Area, Sublette County, Wyoming

TABLE OF CONTENTS

LIST OF APPENDICES..... IV

LIST OF MAPS V

LIST OF FIGURESVII

1.0 EXECUTIVE SUMMARY 8

2.0 INTRODUCTION 11

 2.1 Study Area11

 2.2 Objectives13

 2.3 Datum and GPS.....13

 2.4 Threatened, Endangered, Proposed, and Candidate Species; Wyoming Sensitive Species; and Species of Greatest Conservation Need.....14

 2.5 Overall Monitoring and Protection Measures.....14

3.0 RAPTORS 16

 3.1 Raptors Methods17

 3.2 Raptors Results17

 3.3 Raptors Discussion.....19

4.0 BURROWING OWL..... 20

 4.1 Burrowing Owl Methods20

 4.2 Burrowing Owl Results.....21

 4.3 Burrowing Owl Discussion.....22

5.0 MOUNTAIN PLOVER 23

 5.1 Mountain Plover Methods.....24

 5.2 Mountain Plover Results.....25

 5.3 Mountain Plover Discussion.....25

6.0 LANDBIRDS..... 27

 6.1 Landbirds Methods28

 6.2 Landbirds Results.....29

 6.3 Landbirds Discussion.....32

7.0 FENCE MONITORING 33

 7.1 Fence Monitoring Methods.....34

II



2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report

7.2 Fence Monitoring Results34

7.3 Fence Monitoring Discussion35

8.0 GENERAL WILDLIFE 37

8.1 General Wildlife Methods.....37

8.2 General Wildlife Results.....37

8.3 General Wildlife Discussion.....41

LIST OF ACRONYMS 43

COMMON AND SCIENTIFIC NAMES OF SPECIES PRESENTED IN THIS REPORT
..... 44

LITERATURE CITED 46



LIST OF APPENDICES

(On Data CD)

Appendix A: Raptors

Appendix B: Burrowing Owl

Appendix C: Mountain Plover

Appendix D: Landbirds

Appendix E: Fence Monitoring

Appendix F: General Wildlife



LIST OF MAPS

Map 1. 2014 Wildlife study areas: the JIDPA (landbirds), its 3-mile buffer (mountain plover, fence and general wildlife) and its 3-mile buffer minus the PAPA (raptors and burrowing owl).....12

Map 2. Landbird point count locations, total birds recorded (size of pie chart) and proportion of each species recorded at each point (fraction of pie chart).....30

Map 3. Fences monitored and fence strike locations recorded in the JIDPA and 3-mile buffer.....36

Map 4. General wildlife observations in the JIDPA and 3-mile buffer.....40



LIST OF TABLES

Table 1. Standard protection measures for all development-related activities in the JIDPA (BLM 2006)...15

Table 2. Summary of 2014 raptor monitoring results in the JIDPA and 3-mile buffer (minus the PAPA)...18

Table 3. Summary of burrowing owl monitoring results: 2009-2014.....21

Table 4. 2014 mountain plover sightings in the JIDPA and 3-mile buffer.....25

Table 5. Summary of mountain plover sightings in the JIDPA and 3-mile buffer: 2012-2014.....26

Table 6. Landbird species detected in the JIDPA during 2014 point count surveys.....29

Table 7. Fence strikes recorded on 9.3 miles of fence in the northern portion of the JIDPA 3-mile buffer during sage-grouse lekking season.....35

Table 8. List of general wildlife observations in the JIDPA and 3-mile buffer.....38-39



LIST OF FIGURES

Figure 1. Abundance of landbird species detected in the JIDPA during 2014 point count surveys.....31

Figure 2. Landbird species detected in the JIDPA in 2007, 2008, 2010, 2011, 2012, 2013, and 2014 as a percentage of total birds detected.....32



1.0 EXECUTIVE SUMMARY

Aster Canyon Consulting, Inc. (Aster Canyon) has prepared this 2014 Jonah Infill Drilling Project Area Wildlife Monitoring Report in compliance with criteria set forth by the Bureau of Land Management (BLM) and the Jonah Interagency Mitigation and Reclamation Office (JIO), as described in the *Wildlife Monitoring Plan for the Jonah Infill Drilling Project Area* (WMP; JIO 2014), updated March 2014. The objectives of monitoring wildlife in the Jonah Infill Drilling Project Area (JIDPA) and surrounding 3-mile buffer are: (1) to compare observations and data collected over time; (2) to identify existing mitigation and protection measures as described in the BLM Jonah Field Record of Decision (ROD; BLM 2006); and (3) to offer recommendations on how to improve monitoring, mitigation and protection measures. The principal protection measure undertaken in the JIDPA for the majority of wildlife species is the avoidance of sensitive or critical habitats during certain times of the year, specifically raptor and burrowing owl nesting sites, mountain plover breeding grounds, and greater sage-grouse leks.

Monitoring criteria discussed in the WMP are for US Fish & Wildlife Service (USFWS) Threatened, Endangered, Proposed, and Candidate (TEPC) species, Wyoming Game & Fish Department (WGFD) Species of Greatest Conservation Need (SGCN), and BLM Wyoming Sensitive Species (WSS). Species included in these listings that were independently inventoried in 2014 include raptors (golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), etc.), burrowing owl (*Athene cunicularia*), mountain plover (*Charadrius montanus*), and landbirds. General wildlife observations and fence monitoring were also conducted in 2014. All data presented in this report were collected between August 16th, 2013 and August 15th, 2014.

To view past wildlife monitoring reports, please visit the JIO website at: <http://www.wy.blm.gov/jio-papo/jio/monitoring.htm>.

This report is organized according to species and provides an introduction, methods, results, and a discussion for each species inventoried. A brief summary of monitoring results is presented below:



RAPTORS

- 150 nest locations were monitored in the JIDPA and 3-mile buffer in 2014.
- 2 ferruginous hawk nests on artificial nesting structures in the 3-mile buffer were active and successfully fledged young.
- 3 American kestrel nests were active.
- 1 red-tailed hawk, 1 ferruginous hawk, 1 common raven, and 1 golden eagle nest were occupied but not active.

BURROWING OWL

- 83 nest locations were monitored in the JIDPA and 3-mile buffer in 2014.
- 9 new burrowing owl nests were recorded.
- 10 burrowing owl pairs successfully hatched and fledged young.

MOUNTAIN PLOVER

- 20 previously-identified mountain plover habitats were surveyed in the JIDPA and 3-mile buffer in 2014.
- 4 adult mountain plovers (4 separate sighting) were observed.

LANDBIRDS

- 34 landbird point count surveys were conducted in the JIDPA in 2014.
- 205 individual birds, comprising 8 species of landbird, were detected during point counts.

FENCE MONITORING

- 9.3 miles of fence were monitored 8 times during greater sage-grouse lekking season (March, April, and May).
- 5 simple strikes and 8 mortality strikes of greater sage-grouse were recorded. In addition, 1 mortality strike of pronghorn antelope was recorded.

GENERAL WILDLIFE

- Common species which were routinely observed in the JIDPA and 3-mile buffer in 2014 include: pronghorn antelope (*Antilocarpa americana*), white-tailed jackrabbit (*Lepus townsendii*), cottontail rabbit (*Sylvilagus spp.*), white-tailed

prairie dog, ground squirrel (*Spermophilus spp.*), common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*), vesper sparrow (*Pooecetes gramineus*), mourning dove (*Zenaidura macroura*), and sage thrasher (*Oreoscoptes montanus*).

- 31 other wildlife species (25 avian, 5 mammalian, 1 reptilian) were detected in the JIDPA and 3-mile buffer in 2014; species of note include greater sage-grouse (*Centrocercus urophasianus*) and red-necked phalarope (*Phalaropus lobatus*).

Species not specifically referred to in the WMP, but who are TEPC, SGCN, or WSS, including white-tailed prairie dog (*Cynomys leucurus*), pygmy rabbit (*Brachylagus idahoensis*), greater sage-grouse, and black-footed ferret (*Mustela nigripes*), are discussed below:

WHITE-TAILED PRAIRIE DOG

- White-tailed prairie dog town mapping was not required in 2014.
- White-tailed prairie dog town mapping will reinitiate in 2016.

PYGMY RABBIT

- Pygmy rabbits were not required to be monitored in 2014.
- Monitoring for pygmy rabbits will reinitiate in 2016.

GREATER SAGE-GROUSE

- Monitoring for greater sage-grouse was not required in 2014.
- The BLM and WGFD conduct annual sage-grouse lek surveys and inventories in the JIDPA and 3-mile buffer.
- A total of 5 incidental greater sage-grouse observations, totaling 13 individuals, occurred in the JIDPA and 3-mile buffer in 2014.

BLACK-FOOTED FERRET

- Monitoring for black-footed ferret is no longer required in the JIDPA as per a USFWS decision.

2.0 INTRODUCTION

The JIDPA is located in the Upper Green River Basin and exists entirely in Sublette County, Wyoming. The JIDPA lies approximately 32 miles southeast of Pinedale, Wyoming, between United States Highways 189 and 191. The JIDPA is situated almost exclusively (94%) on federally-owned lands and has one of the richest concentrations of natural gas in the United States (JIO 2012a). Meanwhile, the sagebrush-dominated ecosystem that predominates in the JIDPA and surrounding area is critically important to many Wyoming wildlife species, and several of Wyoming's TEPC, SGCN, and WSS depend on sagebrush during some part of their life history. Accordingly, the BLM has initiated wildlife monitoring and inventory studies as recommended under the Environmental Impact Statement (EIS), which was written in compliance with the National Environmental Policy Act of 1969 (NEPA). Environmental studies commenced in 1996 with Anderson Environmental Consultants, Inc. and continued from 1997-2005 with TRC Mariah Associates, Inc. (TRC). No funding was allocated for the project in 2006. Since 2007, Aster Canyon has been performing wildlife inventories in the JIDPA and 3-mile buffer.



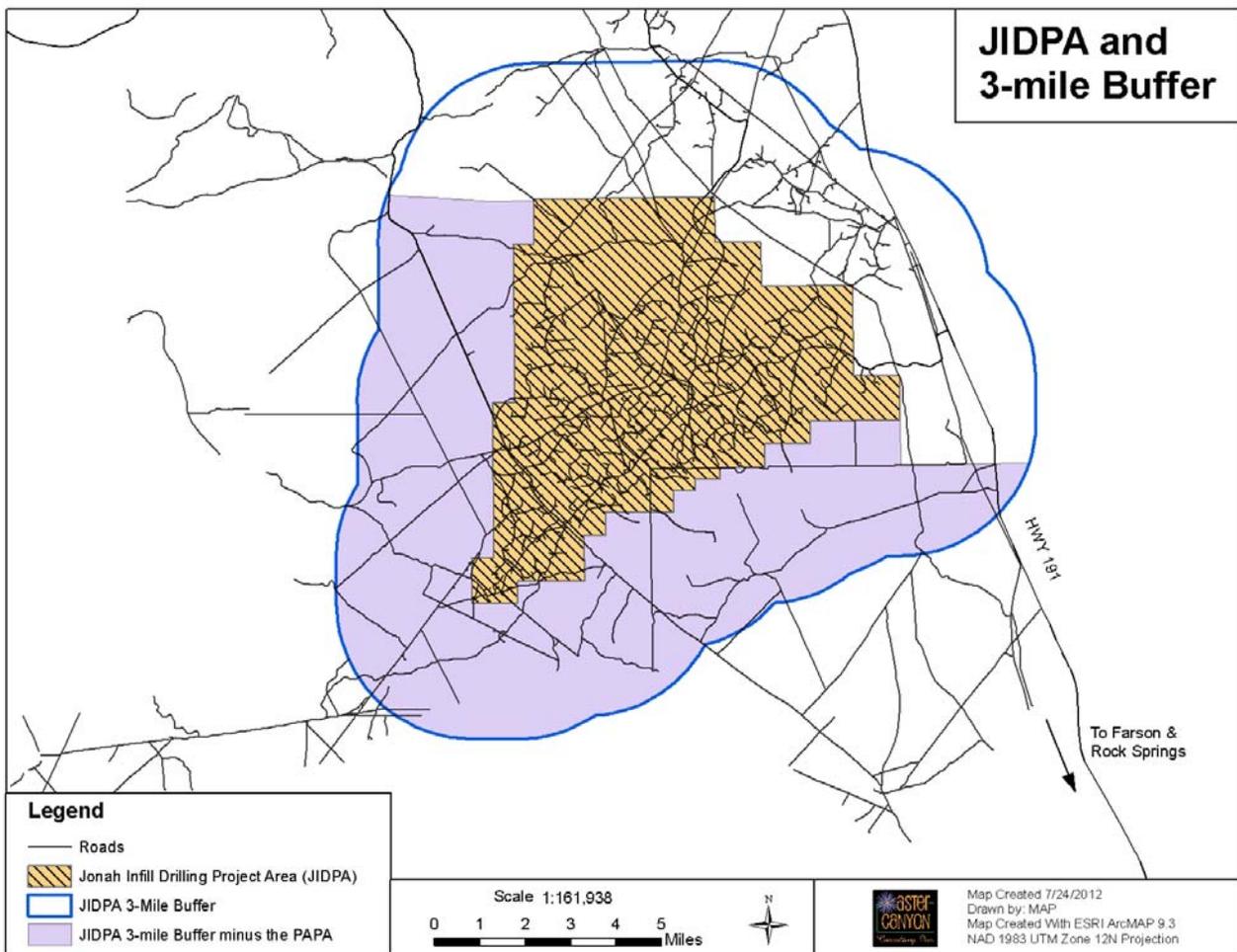
A greater sage-grouse observed in the JIDPA; Photo by A. Tompkins

2.1 Study Area

The JIDPA encompasses approximately 30,500 acres of land in townships 28N and 29N, ranges 107W, 108W and 109W. Aster Canyon's 2014 Jonah Infill Drilling Project Area

Wildlife Monitoring study area includes the JIDPA as well as a surrounding 3-mile buffer (Map 1). Mountain plover, general wildlife, and fence monitoring were conducted throughout the JIDPA and entire 3-mile buffer in 2014. The 3-mile buffer on the north and east sides of the JIDPA has been eliminated for raptor and burrowing owl monitoring since 2009, as it overlaps with the Pinedale Anticline Project Area's (PAPA) 3-mile buffer. Landbird point counts were carried out solely within the JIDPA boundary.

Map 1. 2014 Wildlife study areas: the JIDPA (landbirds), its 3-mile buffer (mountain plover, fence and general wildlife) and its 3-mile buffer minus the PAPA (raptors and burrowing owl)



The JIDPA and 3-mile buffer consists of shrub-steppe habitat dominated by Wyoming big sagebrush (*Artemisia tridentata var. wyomingensis*) and containing other species of sagebrush (*Artemisia spp.*), rabbitbrush (*Chrysothamnus spp.*), saltbush (*Atriplex spp.*),

and a variety of forbs and grasses. It is considered a semi-arid, cold desert and is punctuated by rolling hills interspersed with scattered buttes and rocky outcrops. The area is intersected by numerous ephemeral stream channels and washes and contains a handful of man-made reservoirs, including livestock water sources and a spring-fed earthen dam. Total precipitation averages 8.0 inches per year, and the elevation ranges from 7,000 – 7,400 feet above sea level (BLM 2006).

2.2 Objectives

The objectives of JIDPA Wildlife Monitoring in 2014 were to: (1) identify and record wildlife occurring within the JIDPA and 3-mile buffer; (2) provide data to assist in the maintenance of desired wildlife population levels within the JIDPA; and (3) assist land managers and Operators with planning efforts. Aster Canyon’s monitoring of the JIDPA and 3-mile buffer provides data that assists in determining the effects of disturbance on wildlife therein while also providing guidance related to future monitoring. This is intended to help land managers identify appropriate mitigation and protection measures and, if needed, revise the EIS wildlife models and projections.

2.3 Datum and GPS

Global Positioning System (GPS) locations were recorded using Garmin Rino110 and Trimble GeoXT GeoExplorer - 2005 series in the Universal Transverse Mercator (UTM) coordinate system, Zone 12 north in the North American Datum of 1983. All locations were then projected into a Geographic Information System (GIS) and plotted using ESRI ArcGIS 9®, ArcMap version 9.3.

2.4 Threatened, Endangered, Proposed, and Candidate Species; Wyoming Sensitive Species; and Species of Greatest Conservation Need

There are several species on the USFWS's TEPC list, the BLM's WSS list, and the WGFD's SGCN list that occur within the JIDPA and 3-mile buffer. These species can be found online at:

USFWS Federally listed, Proposed and Candidate Species by County – Wyoming:
http://www.fws.gov/wyominges/Pages/Species/Species_Endangered.html

BLM Wyoming Sensitive Species Policy and List:
<http://www.blm.gov/wy/st/en/programs/Wildlife.html>

WGFD Wyoming Species of Greatest Conservation Need:
<http://wgfd.wyo.gov/web2011/wildlife-1000407.aspx>

TEPC, WSS, and SGCN species which are discussed in the WMP include the following (JIO 2012b): black-footed ferret, white-tailed prairie dog, pygmy rabbit, ferruginous hawk, golden eagle, western burrowing owl, mountain plover, greater sage-grouse, and landbirds. All incidental observations of species not specifically surveyed for in 2014 were recorded in the WGFD Wildlife Observation System (WOS) and are included in the General Wildlife section of this report.

2.5 Overall Monitoring and Protection Measures

Each species presented in this report has monitoring and protection measures specific to its individual needs. Table 1 presents wildlife protection measures (by species) that pertain to development-related activities occurring within the JIDPA. However, some measures, such as the protection and conservation of critical habitat, apply to all wildlife species. Particular habitats which effectively increase the JIDPA's biodiversity include: sand draws, rocky outcrops, reservoirs, and un-fragmented sagebrush stands. Aster Canyon posits that the preservation of these vital habitats is critical for the persistence of many sensitive species in the area. Also, prairie dogs are an important resource for several species in the JIDPA, as they provide food for raptors and habitat for burrowing owl and mountain plover.

2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report

Table 1. Standard protection measures for all development-related activities in the JIDPA (BLM 2006)

Affected Areas	Applied Restrictions	Restriction Time Frame	Restricted Area Distance
Greater sage-grouse lek	No surface occupancy	Year-round	Within 0.25-mile of occupied lek boundary
Greater sage-grouse lek	No surface-disturbing activity	March 1 - May 15	Within 0.25-mile of occupied lek boundary
Greater sage-grouse nesting habitat	No surface-disturbing activity	March 15 - July 15	Within 2-miles of active lek or within suitable nesting habitat
Greater sage-grouse winter habitat	No surface-disturbing activity	November 15 - March 14	Within identified winter habitat
Greater sage-grouse lek/strutting grounds	Surface occupancy or use restricted or prohibited	March 1 - May 15 (8 pm to 8 am)	Within 0.25-mile of lek/strutting grounds boundary
Mountain plover	No surface-disturbing activity until 2 surveys (no earlier than 4/20 and 5/4) show no nesting activity; activity must begin within 72 hours of survey	April 10 - July 10	Within potential mountain plover habitat
Bald eagle nest	No surface occupancy	Year-round	Within .5-mile of active nest
Bald eagle nest	No surface-disturbing activity	February 1 - August 15	Within 0.5-mile of active and alternative nests
Bald eagle winter use area	No surface-disturbing activity; disruptive activities restricted	November 15 - April 1	Within 1-mile of roost site
Ferruginous hawk nest	No surface occupancy	Year-round	Within 1,000 feet of active nest
Ferruginous hawk nest	No surface-disturbing activity	February 1 - July 31	Within 1-mile of active nest
Other raptors	No surface occupancy	Year-round	Within 825 feet of active nest
Other raptors	No surface-disturbing activity	February 1 - July 31	Within 0.5-mile of active nest
Sand draw	No surface occupancy	Year-round	Within 300 feet

As stated in the ROD, intensive surface-disturbing activities in the JIDPA will likely have significant impacts on wildlife, including displacement and/or extirpation of local populations; therefore, mitigation is encouraged to maintain and protect wildlife. The JIO was formed to provide overall on-site and off-site management of field monitoring and mitigation activities. The JIO is also tasked with managing a ‘monitoring and mitigation’ fund, which was initially provisioned \$24.5 million by EnCana Oil and Gas (USA) Inc. and BP American Production Company. Of the original \$24.5 million, \$16.5 million were



committed to off-site wildlife mitigation while the remaining \$8 million were committed to other environmental initiatives (JIO 2012a).

Finally, previously-unidentified protection measures for TEPC, WSS, and SGCN species are often identified during field reviews by the BLM and Operators during on-site meetings for Applications for Permits to Drill, Right of Way, and in Sundry Notices. When these protection measures are identified, surveys by BLM-approved consulting biologists are usually required, with survey protocols being coordinated with BLM biologists.

3.0 RAPTORS

Raptors are an integral part of the sagebrush-steppe ecosystem, as they are critical for maintaining stable populations of small mammals such as ground squirrels and prairie dogs. They do so by regulating herbivory, which helps to safeguard plant communities and protect the overall health of the ecosystem. As many raptor species are sensitive to development and other anthropogenic disturbances, they can also serve as indicators of overall ecosystem health.

Raptors that are generally found nesting within the JIDPA and 3-mile buffer include the ferruginous hawk and American kestrel (*Falco sparverius*). A nesting golden eagle pair was also documented in 2012 and 2013, and was observed but did not nest in 2014. It is possible that short-eared owl (*Asio flammeus*), an open-country ground nester (Wiggins et al. 2006), is also breeding in the area. These raptors are all protected under the Migratory Bird Treaty Act (MBTA) of 1918; golden eagles are also protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c) of 1940. In addition, the ferruginous hawk is listed as a WSS and a SGCN species. Incidental sightings of non-nesting raptors observed in the JIDPA and 3-mile buffer can be found in the General Wildlife section of this Report.

Aster Canyon biologists monitored nesting raptor activity in the JIDPA and 3-mile buffer (minus the PAPA) from April 30th - July 10th, 2014 with the objectives of monitoring

previously-recorded raptor nests to determine nesting activity and success, and searching for new nests. Additionally, Aster Canyon's monitoring assists Operators with planning efforts and helps them remain in compliance with the MBTA. Real-time reporting, which was submitted to Operators, the BLM, and the JIO after each round of surveys, also offers nesting raptors valuable protection as soon as possible. The following are methods, results, and discussion for the 2014 monitoring season.

3.1 Raptors Methods

2014 raptor nest monitoring was performed as per the *Raptor Survey Protocol*, found in the *Wildlife Survey Protocols, Pinedale Field Office Version 2.3* and the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*. BLM-required spreadsheets were used to record all monitoring data.

A total of 150 nest locations were received from the Pinedale BLM and were surveyed during the 2014 nesting season. Monitoring consisted of 2 rounds of nest surveys prior to June 15th plus additional productivity surveys. Productivity surveys were performed to determine hatch and fledge success of active nests. Each round of surveys took place a minimum of 3 weeks apart, as specified in the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*.

3.2 Raptors Results

One-hundred and fifty raptor nest locations were surveyed in the JIDPA and 3-mile buffer (minus the PAPA) during 2014 nest monitoring. Of the 150, 42 were deemed to be historic. All nest locations were monitored 2 times to ensure data accuracy. No new raptor nests were discovered in the JIDPA or 3-mile buffer in 2014. Appendix A contains BLM-required spreadsheets detailing nest activity for all known raptor nests, as well as spreadsheets for Operators to assist with planning.

Nine raptor nests were occupied in the JIDPA and 3-mile buffer in 2014: 3 ferruginous hawk nests (281071001, 291073301 and 291073201), 1 golden eagle nest (291082504), 1 red-tailed hawk nest (281070301), 1 common raven nest (291081309), and 3 American kestrel nests (291080204, 291081209, and 291081313). Of these nests, 2 ferruginous



2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report

hawk nests (291073301 and 291073201), and 3 American kestrel nests (291080204, 291081209, and 291081313) were deemed to be active. An ‘active’ nest is defined by the BLM as one which hosted a breeding attempt. Of these active nests, the 2 ferruginous hawk nests (291073301 and 291073201) successfully hatched and fledged young. Table 2 summarizes results from the 2014 raptor monitoring season. Appendix A-5 is a map displaying all nest locations, occupied and active nests, and NSO and seasonal restriction buffers.

Table 2. Summary of 2014 raptor monitoring results in the JIDPA and 3-mile buffer (minus the PAPA)

Species Monitored	Total Number of Nests	Number of Occupied Nests	Number of Active Nests	Number of Nests Hatch Successful	Number of Nests Fledge Successful
American kestrel	23	3	3	Unknown	Unknown
Ferruginous hawk	89	3	2	2	2
Golden eagle	2	1	0	0	0
Common raven	1	1	0	0	0
Red-tailed hawk	1	1	0	0	0
Unknown raptor	34	0	0	0	0
Total	150	9	5	2	2

Ferruginous hawk

Ferruginous hawk nests 291073201 and 291073301, both of which are located on the artificial nesting structures in the 3-mile buffer south of the JIDPA, successfully hatched and fledged young in 2014. These nests have successfully produced young for several consecutive years.



Ferruginous hawk artificial nesting structure in JIDPA 3-mile buffer; Photo by M. Pomilia

American kestrel

Three American kestrel nests (291080204, 291081209, and 291081313) were observed within the JIDPA and 3-mile buffer during the 2014 monitoring season. The hatch and fledge status of these nests are

unknown. American kestrels were also observed occupying nests within the JIDPA and 3-mile buffer in 2013 and 2011.

3.3 Raptors Discussion

Of the 150 raptor nest locations received from the BLM, 108 were found to still exist as a nest (although in varying conditions) while 42 were recorded as historic nest locations. A total of 5 occupied and active nests were identified: 2 ferruginous hawk and 3 American kestrel. The 2 ferruginous hawk nests were confirmed to have hatched and fledged young.

The artificial nesting structures in the 3-mile buffer south of the JIDPA appear to be serving as excellent nesting sites for ferruginous hawks. The nests on these structures, Nests 291073201 and 291073301, have hosted successful nesting attempts for 7 and 8 years, respectively. These artificial nesting structures are fairly isolated from human activity and are currently the only ferruginous hawk nests being utilized in the area. Based on Aster Canyon's experience and knowledge, it is predicted that populations of ferruginous hawk will remain stable with continual protection of these artificial nesting platforms. The success and productivity of these artificial nesting structures could, however, be compromised if development begins to encroach on the area.

As drilling winds down in the JIDPA over the next several years and human disturbance decreases, the area may become more suitable for nesting raptors and we may begin to see an increase in nesting raptor activity.

Unfortunately, long-term trends in raptor nesting activity cannot be accurately evaluated for a number of reasons: study areas have been reconfigured over time, monitoring protocols have been altered over time, and UTM locations of nests recorded prior to 2007 are unavailable to Aster Canyon. Looking ahead, quick identification of nesting raptors and implementation of appropriate protection buffers should continue to be the focus of monitoring efforts. These actions, combined with a decrease in potential human disturbance, should serve to increase the population of nesting raptors into the future.

4.0 BURROWING OWL

The western burrowing owl is by far the most common owl species observed in the JIDPA and 3-mile buffer. This small, long-legged owl lives underground in burrows usually constructed by prairie dogs or other mammals. The burrowing owl migrates into the region in the spring and nests in the sagebrush-steppe habitat that dominates the JIDPA and surrounding landscape. The burrowing owl is a WSS and SGCN and is protected under the MBTA.

Aster Canyon biologists monitored burrowing owl nest activity within the JIDPA and 3-mile buffer (minus the PAPA) from May 2nd to July 14th, 2014 with the objectives of monitoring previously-recorded burrowing owl nests to determine nesting activity and success, and searching for new nests. Real-time reporting, which was submitted to Operators, the BLM, and the JIO after each round of surveys, also offers nesting burrowing owls valuable protection as soon as possible. The following are methods, results, and discussion for the 2014 monitoring season.

4.1 Burrowing Owl Methods

2014 burrowing owl nest monitoring was performed as per the *Burrowing Owl Survey Protocol*, which follows data collection standards for nesting raptors. This protocol is found in the *Wildlife Survey Protocols, Pinedale Field Office Version 2.3* and the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*. BLM-required spreadsheets were used to record all monitoring data.

A total of 74 nest locations were received from the Pinedale BLM and were surveyed, along with newly-recorded nests, during the 2014 nesting season. Monitoring consisted of 3 rounds of nest surveys plus additional productivity surveys. Productivity surveys were performed to determine hatch and fledge success of active nests. Each round of surveys took place a minimum of 3 weeks apart, as specified in the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*.



A juvenile burrowing owl observed in the JIDPA

4.2 Burrowing Owl Results

Eighty-three burrowing owl nest locations were surveyed in the JIDPA and 3-mile buffer (minus the PAPA) during 2014 nest monitoring. Of the 83 nest locations, all were monitored 3 times, while the 10 nest locations found to be occupied and active were monitored 4 or more times. There were 9 new burrowing owl nests discovered by Aster Canyon biologists in the JIDPA and 3-mile buffer during the 2014 nesting season. Appendix B contains BLM-required spreadsheets detailing nest activity for all known burrowing owl nests, as well as spreadsheets for Operators to assist with planning.

Of the 83 burrowing owl nest locations, 10 were found to be both occupied and active by burrowing owls. An ‘active’ nest is defined as a nest which hosted a breeding attempt. All ten of the active nests successfully fledged young (Table 3). The BLM protocol does not define the term ‘fledge’; in the case of burrowing owls, Aster Canyon defines ‘fledge’ as when fully-feathered young voluntarily leave the nest for the first time (Bird and Bildstein 2007). All 10 occupied and active burrowing owl nests successfully hatched and fledged young during 2014 nest monitoring. Appendix B-6 is a map displaying all nest locations, occupied and active nests, and NSO and seasonal restriction buffers.

Table 3 summarizes results from burrowing owl monitoring during the 2009 – 2014 seasons. The study area in the JIDPA and 3-mile buffer has remained unchanged during these years.

Table 3. Summary of burrowing owl monitoring results: 2009-2014

	Total number of nest locations	Number of Occupied Nests	Number of Active Nests	Number of Nests Hatch Successful	Number of Nests Fledge Successful
2014	83	10	10	10	10
2013	75	12	12	7	7
2012	64	9	8	6	6
2011	61	10	8	7	7
2010	51	12	11	7	7
2009	38	*	6	2	2

* ‘Occupied’ was not a term that was used in the BLM protocol in 2009

4.3 Burrowing Owl Discussion

Of the 74 nest locations received from the BLM, 47 were found to still exist as a nest (although in varying conditions) while 14 were recorded as gone. Nine new nests were discovered and recorded. A total of 10 occupied and active nests were identified and all 10 nests successfully fledged young. These results are higher than previous years, since only 6 or 7 nests fledged young since 2010, and only 2 fledged young in 2009.

Little is known on the specific dates of arrival and departure of burrowing owls to their breeding grounds, especially in western Wyoming. Burrowing owls are generally found on northern breeding grounds from March to September (Poulin et al. 2011). Aster Canyon has recorded owls on the JIDPA as early as April 4th (in 2008).

The Jonah ROD provides seasonal restrictions for surface-disturbing activities from February 1st through July 31st within 0.5 miles of all active raptor nests. The ROD also states that seasonal buffer distances and dates may vary, depending on factors such as raptor species, nest activity status, prey availability, natural topographic barriers, line-of-site distance(s), and other issues (BLM 2006). Aster Canyon recommends that adaptive management tools continue to be used to evaluate nest protection on a case-by-case basis. For example, inclement weather in a particular year can be considered in determining whether late snow melt has kept owls from using burrows until later in the nesting season. Data can also be analyzed to determine if a particular nest is a 'late' nest and whether a re-nesting attempt has occurred. Nest initiation dates and burrowing owl ecology should always be taken into account when considering potential protection measures.

Unfortunately, long-term trends in burrowing owl nesting activity cannot be accurately evaluated for a number of reasons: study areas have been reconfigured over time, monitoring protocols have changed over time, and UTM locations of nests recorded prior to 2007 are unavailable to Aster Canyon. Looking ahead, quick identification of burrowing owls and implementation of appropriate protection buffers should continue to be the focus of monitoring efforts.

5.0 MOUNTAIN PLOVER

The mountain plover is a migratory shorebird that breeds in open, dry areas of short-grass prairie in the western Great Plains and sagebrush-steppe habitats of the Rocky Mountain states. In Wyoming, mountain plovers can be found throughout much of the state in areas of sparsely-vegetated grasslands and open shrub-steppe habitats (Smith & Keinath 2004). An estimated minimum population size of around 3,400 individuals, or 30% of the total mountain plover population (Plumb et al. 2005), are present in the state during migration and throughout the breeding season.



Mountain plover adult in Wyoming; Photo by J. Brauch

There is evidence that mountain plover populations have experienced large-scale declines over the past century (Drietz et al. 2006) and that mountain plover numbers decreased significantly from the 1960s to the 1990s (Knopf & Rupert 1996). Population declines and concerns regarding habitat loss led to the mountain plover being proposed for federal listing under the Endangered Species Act (ESA). The mountain plover was first considered as a candidate species for federal listing in 1993 after sufficient evidence for its need for protection was presented. It was then listed as ‘threatened’ under the ESA in 1999. That proposal was amended in 2002, but then withdrawn in 2003 after a review deemed that protection for mountain plovers was unwarranted. Most recently, a 2010 proposal to re-list the mountain plover as a federally threatened species was withdrawn by the USFWS in May 2011 after it was determined that the mountain plover was not threatened or endangered throughout a significant portion of its range (USFWS 2011). The mountain plover is currently listed as a Bird of Conservation Concern by the USFWS, a Species of Concern by the United States Forest Service, a SGCN, a WSS, and is federally protected under the MBTA.

Aster Canyon biologists surveyed for mountain plovers within the JIDPA and 3-mile buffer during the period of May 1st - June 13th, 2014. A total of 3 survey rounds were performed to determine the presence of mountain plovers within pre-determined mountain plover habitats. The results of surveys were reported to the BLM, JIO, and Operators in real-time, following the conclusion of each round. The following are methods, results and discussion for the 2014 monitoring season.

5.1 Mountain Plover Methods

Surveys were conducted as per the *Mountain Plover Survey Protocol*, which is found in the *Wildlife Survey Protocols, Pinedale Field Office Version 2.3* and the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*. This protocol was adapted from the USFWS mountain plover survey guidelines (USFWS 2002). The large scale/long term project survey protocol was utilized. BLM-required spreadsheets were used to record all monitoring data.

A total of 20 mountain plover habitat areas within the JIDPA and 3-mile buffer were received from the Pinedale BLM and surveyed for 3 rounds during the breeding season. As per the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*, these habitat areas included all medium quality habitats, low quality habitats that have had plover observations in the past (habitat are 6), and low quality habitats adjacent to medium quality habitats. Appendix C-2 is map displaying all mountain plover habitats surveyed in 2014. Each round being separated by at least 14 days, surveys were conducted between May 1st - June 13th, 2014. This period fell within the required dates for large scale/long term surveys as stated in the BLM survey protocol. Surveys were conducted from sunrise until 10:00 a.m. and were only performed during ideal weather conditions when wind, rain, fog or other elements would not negatively affect mountain plover behavior or reduce the ability of observers to detect mountain plovers. Surveys were conducted from within a vehicle which remained on roads and two-tracks in order to reduce disturbance to the birds. Playbacks were not used during 2014 surveys, as they have not been deemed successful in past monitoring seasons. Habitats were not searched



by foot for nests, as they are extremely difficult to find and searching may disturb nesting mountain plovers.

5.2 Mountain Plover Results

A total of 4 adult mountain plovers were observed within the JIDPA 3-mile buffer during the 2014 monitoring season (Appendix C-2; Table 4). During survey round 1, an adult mountain plover was detected in each previously identified JIDPA habitat areas 1 and 40. One adult mountain plover was observed in habitat area 1 again in survey round 2. During survey round 3, one adult mountain plover was observed in previously identified JIDPA habitat area 15. One of the mountain plovers was observed displaying breeding behavior, one was foraging, and the remaining two flushed upon approach but then settled nearby.

Table 4. 2014 mountain plover sightings in the JIDPA and 3-mile buffer

Sighting #	Date	Habitat (Plot) ID	Adult	Juvenile
1	5/5/2014	1	1	0
2	5/6/2014	40	1	0
3	5/21/2014	1	1	0
4	6/10/2014	15	1	0

5.3 Mountain Plover Discussion

Wyoming serves as a breeding ground for a significant portion of the global mountain plover population; therefore the species should continue to be awarded special consideration by land managers in the state. Population declines in mountain plover have been attributed largely to a loss of suitable habitat. Human activity is a negative modifier of mountain plover habitat (Smith and Keinath, 2004) and although mountain plovers may be tolerant of some habitat modification, encroachment of human development into critical habitats will likely decrease the quality of those habitats and hence reduce or even exclude breeding mountain plovers from the area.

Areas of high quality habitat in the JIDPA and 3-mile buffer which have hosted breeding mountain plovers or been the location of multiple sightings include habitat areas 1, 6, 15,



26, 27, 28, 29 and 30. We recommend that critical habitats in the JIDPA and 3-mile buffer, particularly the habitats listed above, be protected from any potential disturbance, as they will likely play a key role in maintaining a local mountain plover population moving forward.

Since 2000, there have been a total of 74 mountain plover sightings in 12 designated habitat areas within the JIDPA and 3-mile buffer. These habitat areas are: 1, 6, 10, 15, 18, 24, 26, 27, 28, 29, 30, and 40. The earliest year for which we have sightings records is 2000 (Table 5). It should be noted that these observations do not represent a population trend, as methodologies have not been standardized or adjusted for observer effort. Appendix C-3 is a map displaying sightings dating back to 2000. Thus, sightings data from previous years should be interpreted only as denoting the presence of mountain plover in a given area.

Table 5. Summary of mountain plover sightings in the JIDPA and 3-mile buffer: 2000-2014

Year	# Sightings	Habitat Areas
2000	1	30
2002	3	26, 30
2003	2	26, 27
2004	9	1, 26, 28, 29
2005	12	1, 6, 26, 27
2007	9	1, 10, 18, 26, 29
2008	4	6, 27, 29
2009	13	1, 26, 27, 29, 30
2010	7	1, 26, 29, 30
2011	8	1, 15, 24, 26, 29
2012	1	1
2013	1	24
2014	4	1, 40, 15

One major challenge when conducting mountain plover surveys in this area is that access to plots can be difficult, especially when surveying from a vehicle. Many of the habitats are large and do not have roads or two-tracks that allow access to portions of the mapped



habitat, which may reduce the number of mountain plover sightings as a result. One option might be to use all-terrain vehicles (ATVs) to access habitats which are inaccessible by roads. While this option would allow for more thorough surveys, it would likely be more time-consuming and increase disturbance to breeding mountain plovers. Thus, the trade-off between survey coverage and disturbance should be weighed and considered before protocols are altered.

Vegetative height and percentage of bare ground, both key factors influencing suitable mountain plover breeding habitat (Smith & Keinath 2004), can be greatly affected by industrial development. Industrial activities involving ground disturbance and road development tend to create conditions under which exotic plants can invade. Tall or dense-growing exotic vegetation, once established, may create conditions that could greatly decrease the quality of habitat for nesting mountain plovers. If mountain plover habitat is disturbed, efforts should be made to maintain vegetative characteristics that promote suitable conditions for mountain plovers.

Habitat Delineation

Two new habitat areas (39 and 40) were determined to be of medium quality during 2013 habitat delineation efforts, and were surveyed in 2014. One mountain plover was observed in the newly included delineated area 40 during round one monitoring in 2014. This serves as evidence that the re-evaluation and re-delineation of mountain plover habitat is important to evaluate changing landscape characteristics, reflect more accurate habitat boundaries, and improve monitoring for future years. It is recommended that delineation be accomplished with the use of imagery such as aerial photography or imagery from the National Agriculture Imagery Program, combined with ‘ground truthing’ to confirm the accuracy of habitat classification. Habitat delineation will take place again in 2016.

6.0 LANDBIRDS

All birds discussed in this section are protected under the MBTA. Under the MBTA, the BLM and its leaseholders have a legal obligation to protect species of migratory birds, which occur on lands under federal jurisdiction. Executive Order (EO) No. 13186, ordered in 2001, directs agencies to take additional actions to execute the MBTA. To comply with the EO, the BLM, in cooperation with the USFWS, has developed principles and practices that minimize the amount of unintentional take of migratory birds, focusing particularly on species of concern. Their goals are to conserve, enhance and restore habitats and assess potential risks to migratory birds.

The objective of the point count surveys was to calculate relative abundance and diversity of landbird species in the JIDPA. Surveys primarily targeted the group of birds known as Passeriformes, commonly referred to as perching birds, half of which are songbirds.

6.1 Landbirds Methods

In 2010, the Handbook of Field Methods for Monitoring Landbirds (Ralph 1993; Appendix D-2), along with the Rocky Mountain Bird Observatory (RMBO) protocol (Appendix D-1), were used to design a landbird survey protocol for the JIDPA. Thirty-four points were systematically established at the corners of each section within the JIDPA boundary (Appendix D-3; Map 2), to be surveyed once per season. This protocol was utilized in 2010, 2011, 2012 (distance estimations were omitted), 2013, and 2014.

Point counts were performed within a half hour of sunrise until 9:00 a.m., with each point consisting of 2 consecutive 3-minute intervals where all birds heard or seen, including flyovers, were recorded. Weather data including temperature, wind speed, precipitation and cloud cover were also recorded at each point (Cariveau 2007). Surveys were not conducted in conditions of low visibility (i.e. rain, snow, fog) or in winds above 15 mph.

6.2 Landbirds Results



A horned lark observed in the JIDPA; Photo by A. Tompkins

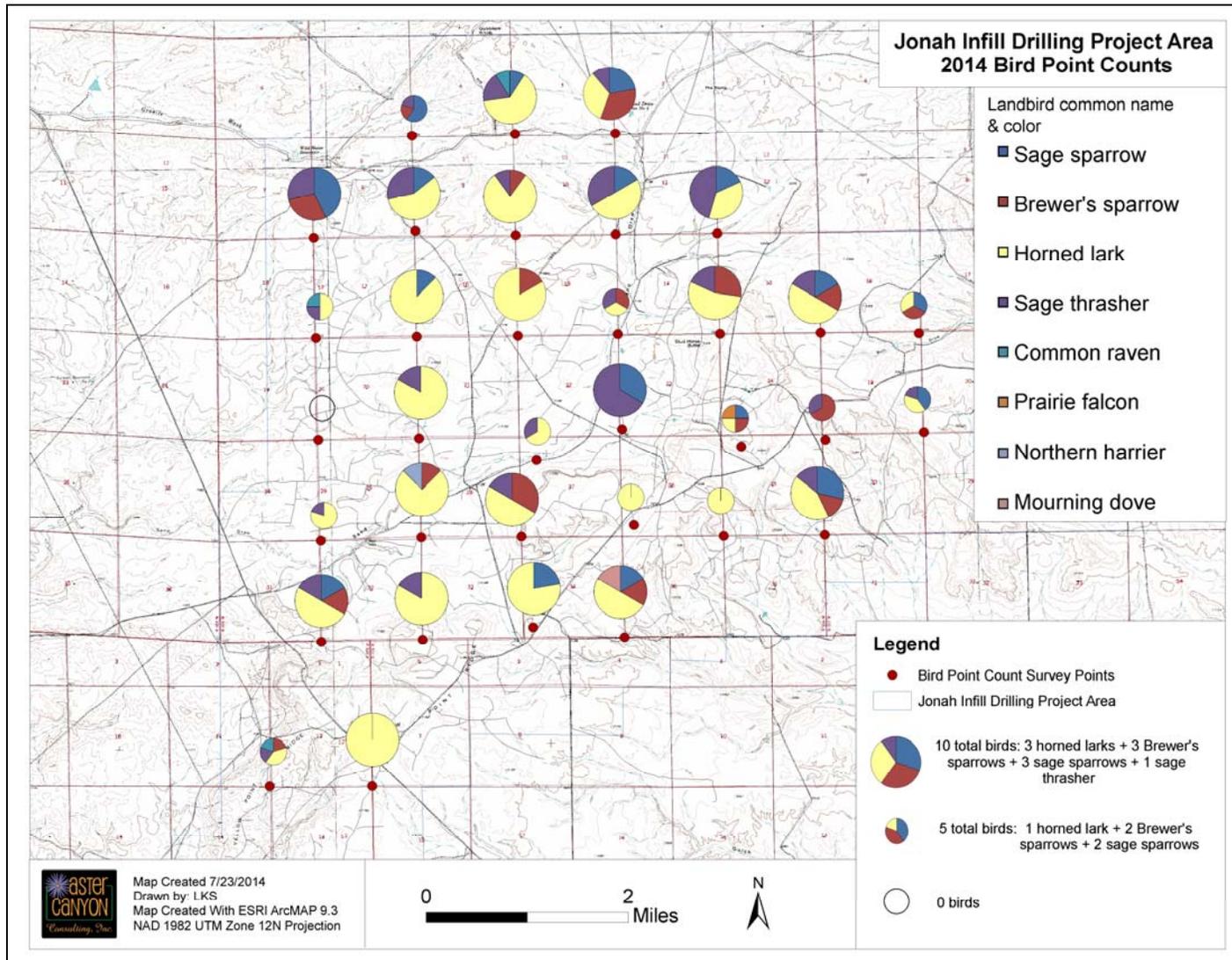
The results presented here include relative abundance and diversity of landbirds detected in 2014, as well as species detections over time. Two hundred and five individual birds, comprising 8 species, were detected in the JIDPA in 2014 (Figure 1; Table 6). Four species were predominant: horned lark, sage sparrow, sage thrasher, and Brewer’s sparrow. The average number of birds detected per point in a given year was 7.4 birds/point in 2007, 4.1 birds/point in 2008, 7.6 birds/point in 2010, 8.2 birds/point in 2011, 10.8 birds/point in 2012, 8.9 birds/point in 2013, and 6 birds/point in 2014.

Table 6. Landbird species detected in the JIDPA during 2014 point count surveys

COMMON NAME	FOUR-LETTER CODE	SCIENTIFIC NAME
Brewer’s sparrow	BRSP	<i>Spizella breweri</i>
Common raven	CORA	<i>Corvus corax</i>
Ferruginous hawk	FEHA	<i>Buteo regalis</i>
Horned lark	HOLA	<i>Eremophila alpestris</i>
Mourning dove	MODO	<i>Zenaida macroura</i>
Northern harrier	NOHA	<i>Circus cyaneus</i>
Sage sparrow	SAGS	<i>Amphispiza belli</i>
Sage thrasher	SATH	<i>Oreoscoptes montanus</i>

When species composition from 2014 was compared with data from 2007-2013, the results were reasonably similar. The same 4 species were predominant, even with a smaller sample size in 2014 than in 2007 and 2008, when large, intensive studies were performed (34 points in 2010-14 versus 225 points in 2007 and 2008; Figure 2). The findings for these commonly-detected species are described in detail below:

Map 2. Landbird point count locations, total birds recorded (size of pie chart) and proportion of each species recorded at each point (fraction of pie chart)



Brewer’s Sparrow (BRSP): 24 BRSPs were detected, comprising 12% of total landbirds. Compared to 2013, this represents the same relative abundance, and a decrease in raw abundance. BRSPs comprised 26% of total birds detected in 2007, 21% in 2008, 6% in 2010, 20% in 2011, 8% in 2012, and 12% in 2013.

Horned Lark (HOLA): 113 HOLAs were detected, comprising 55% of total landbirds. This represents an increase in relative abundance but a decrease in raw abundance compared to 2012 and 2013.

Sage Sparrow (SAGS): 27 SAGSs were detected, comprising 13% of total landbirds detected. This represents an increase in relative abundance but a decrease in raw abundance as compared to previous years.

Sage Thrasher (SATH): 35 SATHs were detected, comprising 17% of total landbirds. This represents an increase as compared to previous years. SATHs were detected at 68% of points in 2014.

Figure 1. Abundance of landbird species detected in the JIDPA during 2014 point count surveys

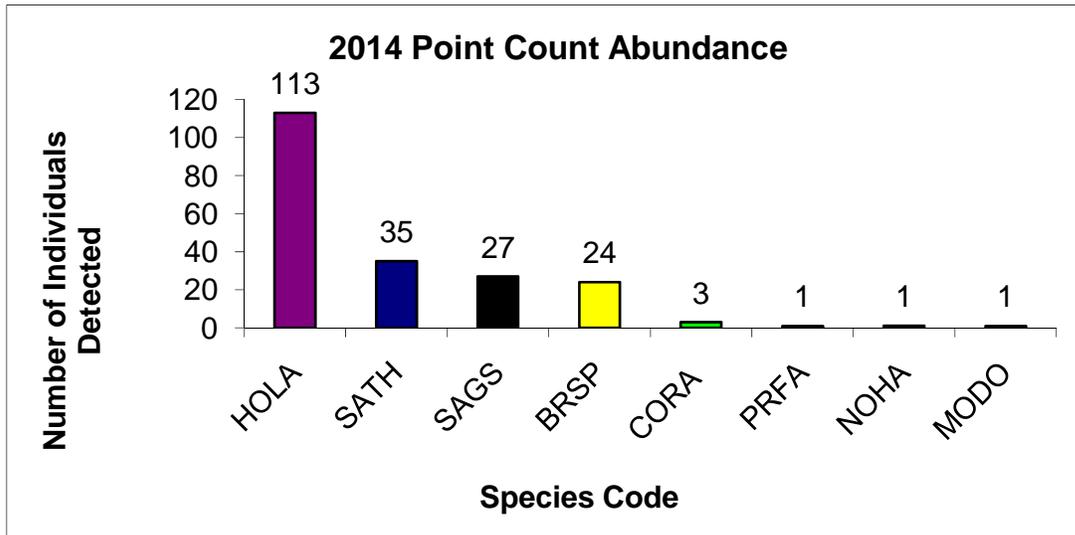
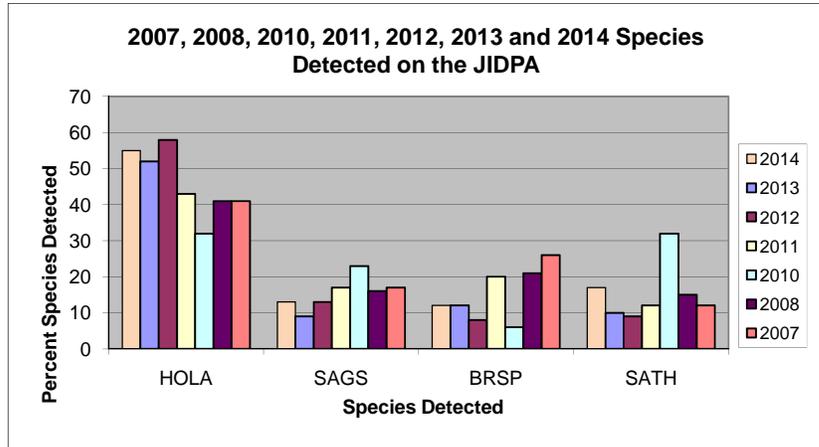


Figure 2. Landbird species detected in the JIDPA in 2007, 2008, 2010, 2011, 2012, 2013, and 2014 as a percentage of total birds detected



6.3 Landbirds Discussion

It is important to monitor populations of sagebrush-obligate species listed as WSS and SGCN such as Brewer’s sparrow, sage sparrow, sage thrasher, and loggerhead shrike (*Lanius ludovicianus*). These species are listed as WSS and SGCN due to population declines throughout their ranges; for example, Brewer’s sparrow experienced an annual decline of 1.5% between 1980 and 2007, while the sage thrasher declined 1.1% annually during the same time period (Sauer et al. 2008). At present, these species are monitored nationally by breeding bird surveys. 2014 abundance and diversity of landbirds, along with inter-annual trends, are discussed below:

Abundance

Horned larks, sage thrashers and sage sparrows were the most abundant bird species during 2014 surveys, comprising 55%, 17%, and 13% of all detections, respectively. Relative abundances of common species were higher in 2014 as compared to previous years.

Overall, fewer birds were detected this year (6/point) than in previous years. In large part, this is due to a substantially lower abundance of horned larks observed in 2014. In 2013 and 2012 there were a few points containing very high abundances of horned larks (as many as 46 at one point), while the highest single point count abundance of horned larks in 2014 was 8. There were 113 total horned larks observed in 2014, compared to 156 in 2013, and 212 in 2012. There were also substantially fewer common ravens observed in 2014; 3 common ravens were documented in 2014, compared to 19 in 2013, and 12 in 2012.

Diversity

Eight bird species were detected during 2014 point count surveys. This represents less diversity as compared to 2013 and 2012, but similar levels as compared to 2011 and 2010. Diversity abundance was the highest in 2007 and 2008. This is likely due to less intensive survey methods being used in 2010-14, whereas more points and larger areas were surveyed in 2007 and 2008, including significant areas outside of the JIDPA. Two species of raptor were documented in 2014 and 2013, compared to four species in 2012, 1 in 2011 and 0 in 2010. Species detected in 2013 and 2012 that were not observed in 2014 include loggerhead shrike, golden eagle, yellow-rumped warbler, vesper sparrow, ferruginous hawk, greater sage-grouse, swainson's hawk, and red-tailed hawk.

7.0 FENCE MONITORING

In 2014 Aster Canyon monitored designated fence lines in the JIDPA and 3 mile buffer for animal strikes upon the fence. The 2014 monitoring effort documented the occurrence of all fence strikes, both fatal and non-fatal, along the designated fence line.

Previous fence line monitoring, starting in 2010, mapped the locations of fences in the JIDPA and 3 mile buffer and documented the location of any fence strike. Fence markers were placed at sage-grouse strike locations in the hopes to deter further strikes and reduce mortalities associated with fences.

A portion of fence previously monitored by Aster Canyon was included in a Rocky Mountain Bird Observatory study (Dale Woolwine, BLM Biologist, Pinedale Office; personal communication); therefore, fence strike data for this section of fence was not collected by Aster Canyon. Please refer to Appendix E-2 and Map 3 for the fence line monitoring location.

7.1 Fence Monitoring Methods

Fence monitoring was required and completed as per *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*, March 2011. Data was recorded using a Trimble GEO XT 2005 Series with a data dictionary, provided by the BLM Pinedale office.

Fence monitoring was conducted during the sage-grouse lekking season (March – May). For the designated fence line in the northern portion of the JIDPA (9.3 miles), fences were monitored once per week during the last two weeks in March, once per week during the month of April, and twice during the month of May (at least 14 days apart), with surveys being conducted between the hours of 9 a.m. - 7 p.m.

All fence strikes by any species were recorded during 2014 fence monitoring. When a strike was located, it was determined whether the strike was a simple strike (the animal was not killed) or if the strike was a mortality strike (the animal was killed). Feathers, fur, or carcasses were removed from the fence and surrounding area to avoid recording the same strike in subsequent surveys. Fence monitoring was either conducted on foot or from a slow moving vehicle (when an existing two-track followed the fence line).

7.2 Fence Monitoring Results

Aster Canyon recorded 14 fence strikes along the 9.3 miles of fence monitored in 2014. The majority (13) of the strikes were by sage-grouse, but one pronghorn strike was also observed. A total of 9 mortality strikes (which includes the pronghorn) were recorded along the monitored fence line (Table 7).

Table 7. Fence strikes recorded on 9.3 miles of fence in the northern portion of the JIDPA 3-mile buffer during 2014 sage-grouse lekking season

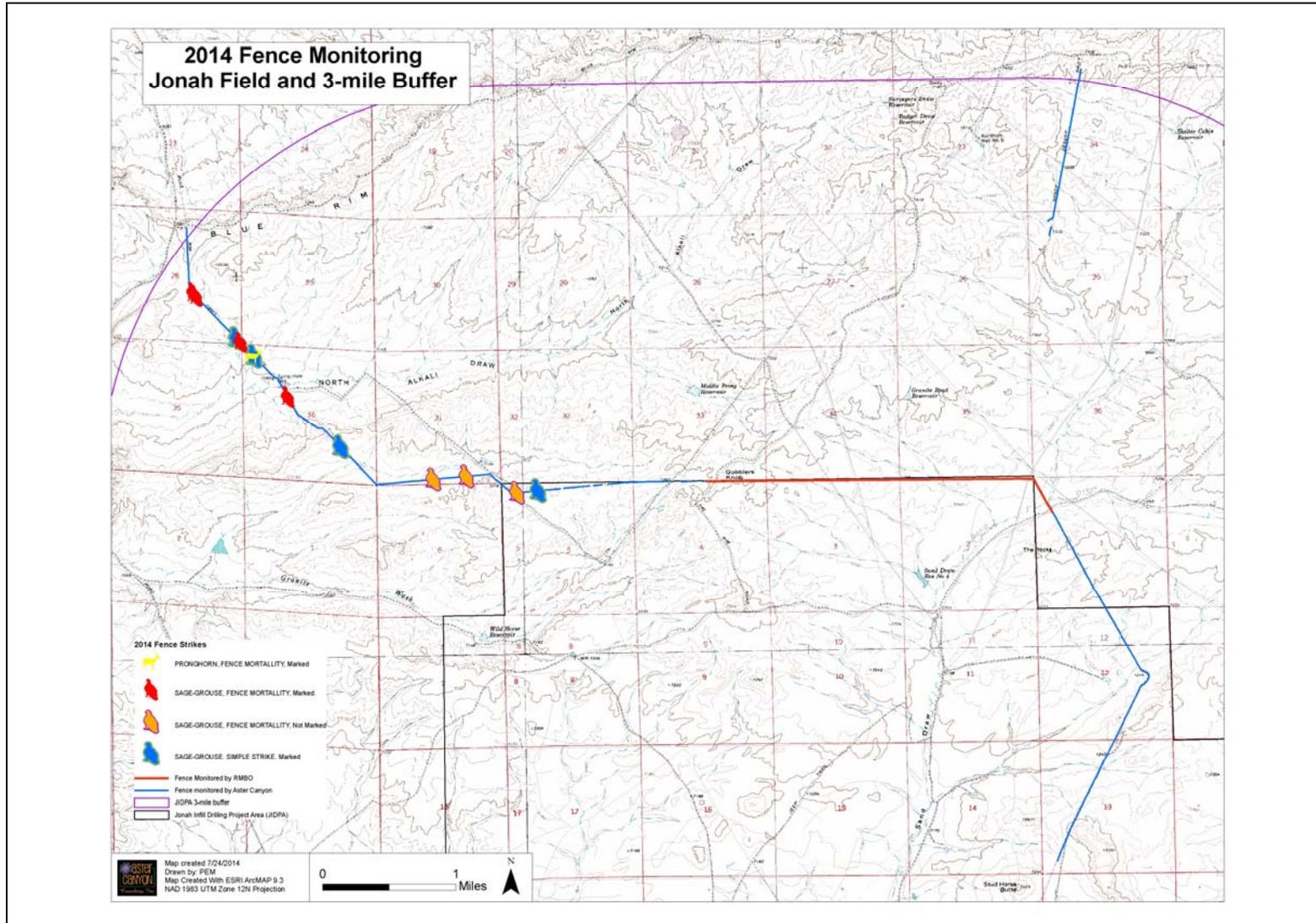
Species	Simple Strikes	Mortality Strikes	Total
Sage-grouse	5	8	13
Pronghorn	0	1	1
Total	5	9	14

Out of the 14 fence strikes observed, 11 of the strikes occurred in areas where the fence was previously marked. All simple strikes (5 total) were in areas with marked fence. See Appendix E-2 and Map 3 for the location of the monitored fence and location of strikes.

7.3 Fence Monitoring Discussion

It is of note that 11 of 14 fence strikes occurred where the fence had previously been marked. This reveals deterrents on fences are not 100% effective at eliminating fence strikes, but it has been reported marking fences with deterrents reduces sage-grouse/fence collisions by up to 83% (Stevens et al. 2012). All simple (i.e. non-fatal) strikes observed in 2014 were in areas with marked fences. This fact may lend itself to the possibility of higher visibility of fences, allowing for last second avoidance of the fence, and therefore a non-fatal collision. Marking fences has been shown to be effective in reducing sage-grouse/fence collisions (Stevens et al. 2012); thus, the practice of marking fences should continue until a better method of preventing fence strikes is found.

Map 3. Fences monitored and fence strike locations recorded in the JIDPA and 3-mile buffer



8.0 GENERAL WILDLIFE

Aster Canyon biologists recorded general wildlife observations in the JIDPA and 3-mile buffer from August 16th, 2013 – August 15th, 2014. Incidental observations were documented while traveling in the study area or while conducting field surveys for focal species. Common species, such as ravens and horned larks, were not documented. General wildlife observation data can be used to assess the local, or statewide, distribution of these species.

8.1 General Wildlife Methods

General wildlife observations were recorded according to the Wyoming Game and Fish Department's Wyoming Observation System (WOS), as specified in the Wildlife Monitoring Plan. Focal species documented during surveys were not recorded under general wildlife observations. For example, raptors observed during raptor monitoring were not included in the WOS data; however, raptors observed during surveys for other species were recorded.

8.2 General Wildlife Results

Common species routinely observed in the JIDPA and 3-mile buffer in 2014 include: pronghorn antelope, white-tailed prairie dog, ground squirrel, common raven, horned lark, Brewer's sparrow, sage sparrow, and sage thrasher. Observations of these species were not recorded as part of the general wildlife observations. For species that were recorded, Aster Canyon biologists recorded 31 species in and around JIDPA and 3-mile buffer (Table 8). Aster Canyon biologists made 114 observations of 217 individuals in 2014. Locations of all observations can be found on Map 4. Species of note include Greater Sage-Grouse and Red-Necked Phalaropes. The WOS spreadsheet of all general wildlife observations can be found in Appendix F.

Birds

A total of 25 bird species was observed in the JIDPA and 3-mile buffer in 2014. Bird observations included 6 species of waterfowl, 2 species of wading birds, and 6 species of

songbirds. Several birds observed in 2014 are Wyoming species of concern. These species include: Greater Sage-Grouse, American Avocet, Red-Necked Phalarope, Burrowing Owl, and Loggerhead Shrike,

Mammals

Five mammalian species were recorded in the general wildlife observation in 2014. Of note is the observation of wild horses in the northern region of the JIDPA and 3-mile buffer. Wild horses have only been documented in the southern region of the JIDPA during previous monitoring seasons.

Reptiles and Amphibians

Greater Short-Horned Lizards made up the entirety of herpetofauna observed in the study area.

Table 8. List of general wildlife observations in the JIDPA and 3-mile buffer

Species	Observations	Individuals Observed
Birds		
Mallard	2	2
Green-winged teal	1	2
Blue-winged teal	1	2
Cinnamon teal	1	1
Northern shoveler	1	2
Canada goose	1	12
Red-necked phalarope	2	7
American avocet	4	8
Killdeer	2	5
Greater sage-grouse ^{1,2,3}	5	13
Mourning dove	3	15
Northern harrier	3	3
Red-tailed hawk	9	9

2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report

Swainson's hawk	3	4
Ferruginous hawk ^{1,3}	5	5
Golden eagle ⁴	10	11
Prairie falcon	8	9
Burrowing owl	2	3
Common nighthawk	4	6
Western kingbird	1	1
Say's phoebe	1	1
Lark bunting	1	1
Loggerhead shrike ¹	9	12
Rock wren	9	17
Mountain bluebird	2	3
Total	90	154
Mammals		
Desert Cottontail	6	10
Coyote	1	2
Badger	1	1
Mule Deer	1	1
Wild Horse	8	41
Total	17	55
Reptiles and Amphibians		
Greater Short-Horned Lizard	7	8
Total	7	8
Overall Total	114	217

1 = BLM Sensitive Species

3 = WGFD Species of Greatest Conservation Need

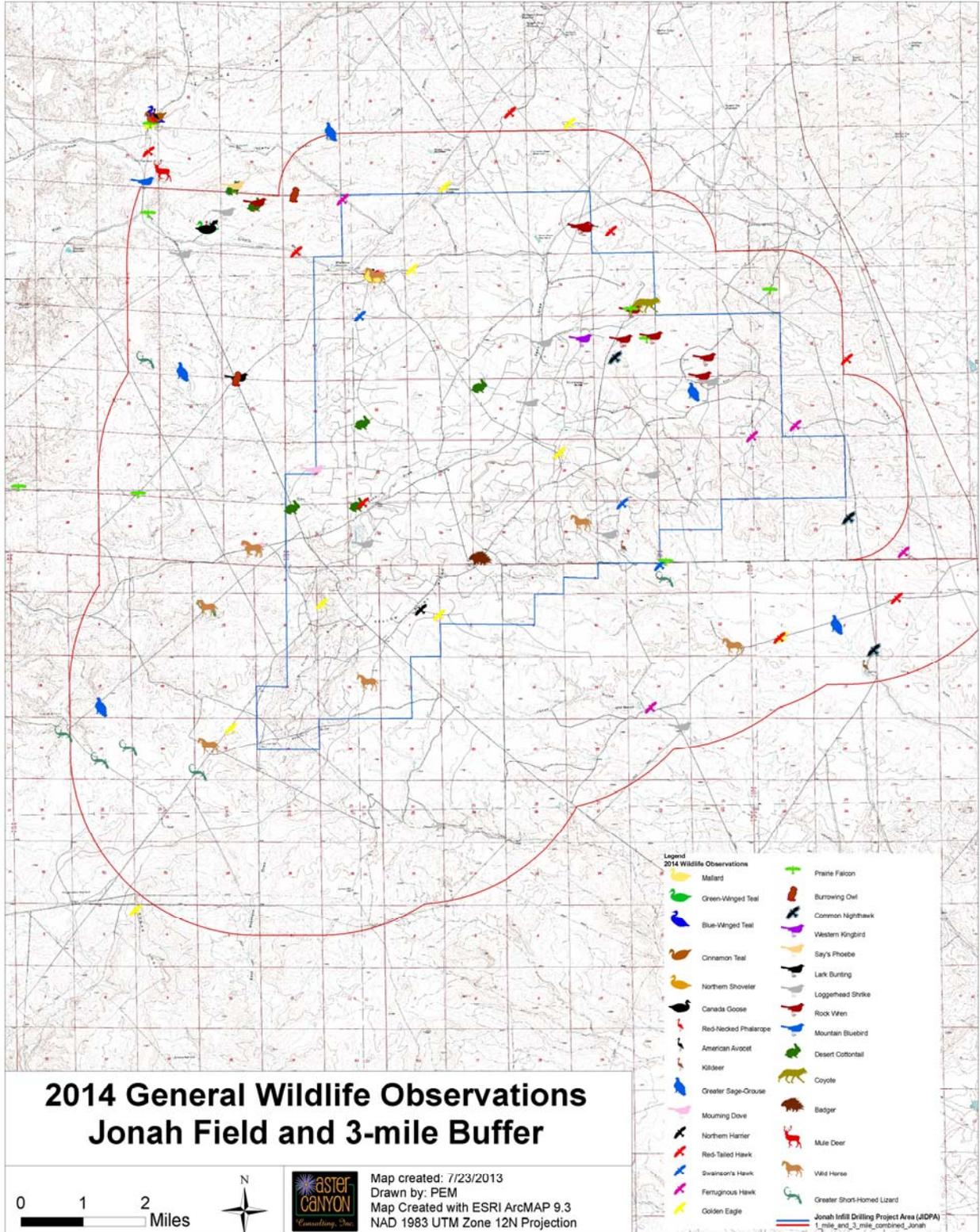
2 = USFWS Threatened, Endangered, Protected, and Candidate Species

4 = Protected under Bald eagle and Golden eagle Protection Act



2014 Jonah Infill Drilling Project Area Wildlife Monitoring Final Report

Map 4. General wildlife observations in the JIDPA and 3-mile buffer



8.3 General Wildlife Discussion

Sagebrush/steppe, which is the primary habitat of the JIDPA, is a diverse habitat type. A large array of species utilize this habitat for breeding, migration or wintering grounds, as the 31 different species recorded in the 2014 WOS confirms.

The 31 species recorded in and around the JIDPA attests to the diversity of the area and shows the need to limit habitat alterations. Especially in areas considered critical habitat, such as draws, water sources, rocky outcrops, etc. By limiting alteration of the habitat initially, mitigation and reclamation efforts in the end will be reduced. While mitigation and reclamation efforts are important parts of restoring disturbed areas; these efforts can never restore the area to exactly what the area was before disturbance. Also, mitigation and reclamation efforts may benefit some species over others, potentially reducing diversity in the area.



Greater short-horned lizard observed in the JIDPA

9.0 CONCLUSION

The data presented in this report is designed to assist land managers in maintaining wildlife resources in the JIDPA and 3-mile buffer at appropriate levels. Trends in local wildlife populations were presented where available; however, for most species, the ability to evaluate trends has been affected by changes in study area boundaries (namely the reduction of the 3-mile buffer) and study design (i.e. for landbirds). When wildlife population trend data in the JIDPA becomes more reliable, the effects of disturbance on wildlife will become more apparent and, henceforth, mitigation efforts can be improved.

Ongoing mitigation efforts should persist. This includes the avoidance of raptor nests and sage-grouse leks during critical time periods, along with the addition of more artificial nesting structures. It is also recommended that all non-industrial fences be removed or replaced with wildlife-friendly fences to allow wildlife in the JIDPA to move more freely and avoid unnecessary injuries or mortalities. In addition, educating workers in the JIDPA about the importance of protecting wildlife should continue to be a high priority.

LIST OF ACRONYMS

Agencies and Companies

BLM = Bureau of Land Management
JIO = Jonah Interagency Reclamation and Mitigation Office
TRC = TRC Mariah Associates, Inc.
USFWS = United States Fish and Wildlife Service
WGFD = Wyoming Game and Fish Department
WLCI = Wyoming Landscape Conservation Initiative
WWNRT = Wyoming Wildlife and Natural Resource Trust

Other

ATV= All Terrain Vehicle
EIS = Environmental Impact Statement
EO = Executive Order
ESA = Endangered Species Act
GIS = Geographic Information Systems
GPS = Geographic Positioning Systems
JIDPA = Jonah Infill Drilling Project Area
JMPH= Jonah Mountain Plover Habitat (potential habitat)
MBTA = Migratory Bird Treaty Act
NEPA= National Environmental Policy Act
PAPA= Pinedale Anticline Project Area
RMBO = Rocky Mountain Bird Observatory
ROD = Record of Decision
SGCN = Species of Greatest Conservation Need
TEPC = Threatened, Endangered, Proposed, and Candidate Species
UTM = Universal Transverse Mercator
WMP = Wildlife Monitoring Plan
WOS = Wildlife Observation System
WSS = Bureau of Land Management Wyoming Sensitive Species

COMMON AND SCIENTIFIC NAMES OF SPECIES PRESENTED IN THIS REPORT

COMMON NAME	SCIENTIFIC NAME
<i>Birds</i>	
American avocet	<i>Recurvirostra americana</i>
American kestrel	<i>Falco sparverius</i>
Brewer's sparrow	<i>Spizella breweri</i>
Burrowing owl	<i>Athene cunicularia</i>
Common nighthawk	<i>Chordeiles minor</i>
Common raven	<i>Corvus corax</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
Greater sage-grouse	<i>Centrocercus urophasianus</i>
Green-winged teal	<i>Anas crecca</i>
Horned lark	<i>Eremophila alpestris</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Mallard	<i>Anas platyrhynchos</i>
Mountain plover	<i>Charadrius montanus</i>
Mourning dove	<i>Zenaida macroura</i>
Northern flicker	<i>Colaptes auratus</i>
Northern harrier	<i>Circus cyaneus</i>
Prairie falcon	<i>Falco mexicanus</i>
Red-necked phalarope	<i>Phalaropus lobatus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rock wren	<i>Salpinctes obsoletus</i>
Sage sparrow	<i>Amphispiza belli</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
Short-eared owl	<i>Asio flammeus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
Western meadowlark	<i>Sturnella neglecta</i>

Mammals

American badger	<i>Taxidea taxus</i>
Black-footed ferret	<i>Mustela nigripes</i>
Coyote	<i>Canis latrans</i>
Ground squirrel	<i>Spermophilus spp.</i>
Cottontail rabbit	<i>Sylvilagus spp.</i>
Pronghorn antelope	<i>Antilocapra americana</i>
Pygmy rabbit	<i>Brachylagus idahoensis</i>
White-tailed jackrabbit	<i>Lepus townsendii</i>
White-tailed prairie dog	<i>Cynomys leucurus</i>
Wild horse	<i>Equus ferus</i>



Plants

Rabbitbrush

Chrysothamnus spp.

Sagebrush

Artemisia spp.

Saltbush

Atriplex spp.

Wyoming big sagebrush

Artemisia tridentata var. *wyomingensis*

LITERATURE CITED

- Beason, R.C. 1995. Horned Lark (*Eremophila alpestris*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology.
<<http://bna.birds.cornell.edu/bna/species/195doi:10.2173/bna.195>> Accessed 2 July 2012.
- Bird, D.M. and K.L. Bildstein. 2007. Raptor Research and Management Techniques. Hancock Publishing House, Surrey, British Columbia.
- Bureau of Land Management. 2012. Wildlife Survey Protocols Version 2.3. Bureau of Land Management, Pinedale Field Office, Pinedale, Wyoming.
<http://www.blm.gov/wy/st/en/field_offices/Pinedale/wildlife.html> Accessed 2 July 2012.
- Bureau of Land Management. 2008. Record of Decision and Approved Pinedale Resource Management Plan. BLM Pinedale Field Office, Sublette County, Wyoming.
- Bureau of Land Management. 2006. Record of Decision, Jonah Infill Drilling Project, Sublette County, Wyoming. Bureau of Land Management, Pinedale Field Office, Pinedale, Wyoming.
- Bureau of Land Management. 1989. BLM Manual Handbook, H-1741 Fencing.
- Cariveau, A.B. 2007. Wolford Mountain Travel Management Plan Migratory Bird Monitoring: 2006 Final Report, Rocky Mountain Bird Observatory, Brighton, CO.
- Catlin, D.H. and D.K. Rosenberg. 2008. Breeding Dispersal and Nesting Behavior of Burrowing Owls Following Experimental Nest Predation. The American Midland Naturalist. 159:1-7.
- Catlin, D.H., D.K. Rosenberg, and K.L. Haley. 2008. The Effects of Nesting Success and Mate Fidelity on Breeding Dispersal in Burrowing Owls. Canada Journal of Zoology. 83: 1574-1580.
- Drietz, V.J., P.M. Lukacs, and F.L. Knopf. 2006. Monitoring Low Density Avian Populations: An Example Using Mountain Plovers. The Condor. 108: 700-706.
- Jackson Hole Wildlife Foundation. 2011.
<http://www.jhwildlife.org/index.php/friendly_fencing/> Accessed 2 July 2012.
- Jonah Interagency Mitigation and Reclamation Office. 2008. Monitoring Reclamation Success. Bureau of Land Management, Pinedale Field Office. Sublette County, Wyoming.

- Jonah Interagency Mitigation and Reclamation Office. 2012a.
< <http://www.wy.blm.gov/jio-papo/jio/index.htm>> Accessed 2 July 2012.
- Jonah Interagency Mitigation and Reclamation Office. 2012b. Wildlife Monitoring Plan for the Jonah Infill Drilling Project. Bureau of Land Management, Pinedale Field Office, Pinedale, Wyoming. <<http://www.wy.blm.gov/jio-papo/jio/monitoring.htm>> Accessed 2 July 2012.
- Knopf, F.L. and J.R. Rupert. 1996. Productivity and Movements of Mountain Plovers Breeding in Colorado. *Wilson Bulletin*. 108: 28-35.
- Kochert, M.N., K. Steenhof, C.L. McIntyre, and E.H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*) in *The Birds of North America*, No. 684 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Plumb, R.E., Knopf, F.L. and Anderson, S.H. 2005. Minimum Population Size of Mountain Plovers Breeding in Wyoming. *Wilson Bulletin*. 117(1): 15-22.
- Poulin, R.L., D. Todd, E.A. Haug, B.A. Millsap and M.S. Martell. 2011. Burrowing Owl (*Athene cunicularia*), *The Birds of North America Online* A. Poole, editors. Ithaca: Cornell Lab of Ornithology.
<<http://bna.birds.cornell.edu/bna/species/061doi:10.2173/bna.61>> Accessed 2 July 2012.
- Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin, and D.F. DeSante. 1993. Handbook of field methods for monitoring landbirds. U.S.D.A. Pacific Southwest Research Station, Albany, CA. General Technical Report PSW-GRT-144.
- Sauer, J.R., J.E. Hines, and J. Fallon. 2008. *The North American Breeding Bird Survey, results and analysis 1966-2007*. Version 5.15.2008. *USGS Patuxent Wildlife Research Center*, Laurel, MD.
- Sauer, J.R., J.E. Hines, J.E. Fallon, K.L. Pardieck, D.J. Ziolkowski, Jr., and W.A. Link. 2011. *The North American Breeding Bird Survey, Results and Analysis 1966 - 2010*. Version 12.07.2011 *USGS Patuxent Wildlife Research Center*, Laurel, MD
- Smith, R. and D.A. Keinath. 2004. Species Assessment for Mountain Plover (*Charadrius Montanus*). Wyoming Natural Diversity Database, University of Wyoming, Laramie, WY.
<<http://www.uwyo.edu/wynddsupport/docs/Reports/SpeciesAssessments/>> Accessed 2 July 2012.
- Stevens, B.S., K.P. Reese, J.W. Connelly and D.D. Musil, 2012. Greater sage-grouse and fences: does marking reduce collisions? *Wildlife Society Bulletin* 36: 297 – 303.

U.S. Fish and Wildlife Service. 2002. Mountain Plover Survey Guidelines. U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 2006. *Fact sheet – Greater Sage-grouse (Centrocercus urophasianus)*. <http://www.fws.gov/endangered/esa-library/pdf/sage-grouse_fact_sheet-Aug06.pdf> Accessed 31 July 2012.

U.S. Fish and Wildlife Service. 2011. Withdrawal of the Proposed Rule to List the Mountain Plover as Threatened. Federal Register 76(92): 27756-27799.

Wiggins, D.A., D.W. Holt and S.M. Leasure. 2006. Short-eared Owl (*Asio flammeus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. <<http://bna.birds.cornell.edu/bna/species/062doi:10.2173/bna.62>> Accessed 5 July 2012.

Wyoming Game and Fish Department. 2011. Fence Marking to Reduce Greater Sage-grouse (*Centrocercus urophasianus*) Collisions and Mortality near Farson, Wyoming – Summary of Interim Results. <http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SG_FENCEMARKING0000671.pdf> Accessed 31 July 2012.

Wyoming Landscape Conservation Initiative. 2011. Conserving world-class wildlife resources, facilitating responsible energy development. <https://my.usgs.gov/Public/WLCI/WLCI_Factsheet.pdf> Accessed 2 July 2012.

Wyoming Wildlife and Natural Resource Trust. 2011. Funding application guidelines. <<http://wwnrt.state.wy.us/projectapplications.htm>> Accessed 2 July 2012.