

2011 Wildlife Monitoring for the Jonah Infill Drilling Project Area Final Report

November 1, 2011



Annual Report Prepared for:
U.S. Bureau of Land Management, Jonah
Interagency Office, and Jonah Field Operators

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**2011 JONAH INFILL DRILLING PROJECT AREA WILDLIFE MONITORING FINAL REPORT
NOVEMBER 1, 2011**

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1.0 EXECUTIVE SUMMARY

Aster Canyon Consulting, Inc. (Aster Canyon) has prepared this 2011 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 2011b)). The purpose of the inventories are: to present findings which result from the monitoring of wildlife in the Jonah Infill Drilling Project Area (JIDPA) and its surrounding 3-mile buffer, to compare the observations and data collected over time, to identify existing mitigation and protection measures as described in the BLM Jonah Field Record of Decision (ROD; (BLM 2006)), and to offer recommendations for new mitigation or protection measures and monitoring efforts.

Data presented in this report was collected between August 2010 and August 2011. Monitoring criteria discussed in the WMP are for: threatened, endangered, proposed, and candidate species (TEPC); species of greatest conservation need (SGCN); and BLM Wyoming Sensitive Species (WSS). Species that are included in these listings and were independently inventoried in 2011 are: raptors, landbirds, burrowing owls (*Athene cunicularia*), and mountain plover (*Charadrius montanus*). It should also be noted that general wildlife and fence inventories were conducted in 2011. Species not specifically referred to in the WMP but who are on the TEPC, WSS, or SGCN are categorized in the Wildlife Observation section of this Monitoring Report along with other species of note. Species that were not independently inventoried for in 2011, but are discussed in the WMP include: white-tailed prairie dogs (*Cynomys leucurus*), pygmy rabbits (*Brachylagus idahoensis*), greater sage-grouse (*Centrocercus urophasianus*), and black-footed ferret (*Mustela nigripes*).

This report is presented by species, and provides: an introduction, methods section, results section, and discussion section for each. A summary of the inventory results is provided below:

RAPTOR

- 108 nests were monitored in the JIDPA and 3-mile buffer in 2011.
- 2 ferruginous hawk (*Buteo regalis*) artificial nesting structures in the JIDPA 3-mile buffer were both active and successfully fledged young.
- A sub-adult golden eagle (*Aquila chrysaetos*) attempted to nest on the JIDPA.

BURROWING OWL

- 58 burrowing owl nest locations were monitored in the JIDPA and 3-mile buffer in 2011.
- 6 new burrowing owl nests were recorded.
- 7 burrowing owl nests successfully hatched and fledged young.

MOUNTAIN PLOVER

- 27 previously identified mountain plover habitats were surveyed in the JIDPA and 3-mile buffer.
- A total of 14 adult mountain plovers and one chick were observed during the 2011 nesting season.

LANDBIRD

- 34 point counts were conducted in the JIDPA in 2011.
- 281 individual birds, consisting of 9 species of landbirds, were detected in the JIDPA in 2011.

FENCE INVENTORY AND MONITORING

- 28 miles of fence were inventoried in 2011.
- 2 simple strikes and 1 mortality strike of the greater sage-grouse were recorded during inventory efforts.
- 8.2 miles of fence was monitored during the greater sage-grouse lekking season
- 5 simple strikes and 8 mortality strikes were recorded during the monitoring efforts and included these wildlife species: greater sage-grouse, pronghorn, and passerines.

WILDLIFE OBSERVATIONS

- 19 different species (17 avian and 2 mammalian) were detected in the JIDPA and 3-mile buffer in 2011.
- Species of note observed in 2011 include the: great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis macularius*), and greater sage-grouse.
- All TEPC, SGCN, WSS, and species not individually monitored for, but incidentally observed are included in this section.

Species that were **not** individually monitored in 2011 and are included in the WMP are as follows:

WHITE-TAILED PRAIRIE DOG

- White-tailed prairie dog town mapping was not required in 2011.
- White-tailed prairie dog town mapping will take place again in 2013.

PYGMY RABBIT

- Pygmy rabbits were not required to be monitored in 2011.
- Monitoring for pygmy rabbits will take place again in 2013.

GREATER SAGE-GROUSE

- Monitoring for greater sage-grouse in the JIDPA was not required in 2011.
- The BLM and WGFD will conduct annual lek surveys and inventories within the JIDPA and 3-mile buffer.
- In 2011, there were a total of 4 incidental greater sage-grouse observations that accounted for 8 individuals within the JIDPA and 3-mile buffer.

BLACK-FOOTED FERRET

- Black-footed ferret monitoring is not required in the JIDPA, as per a USFWS decision that the area is included within an area identified to no longer require surveys.

The principal protection measure underway on the JIDPA for most of the wildlife species is the avoidance of sensitive or critical habitats during certain times of the year; more specifically, raptor and burrowing owl nesting sites, mountain plover breeding grounds, and greater sage-grouse leks.



A common nighthawk (*Chordeiles minor*), observed often in the JIDPA and 3-mile buffer.

2.0 INTRODUCTION

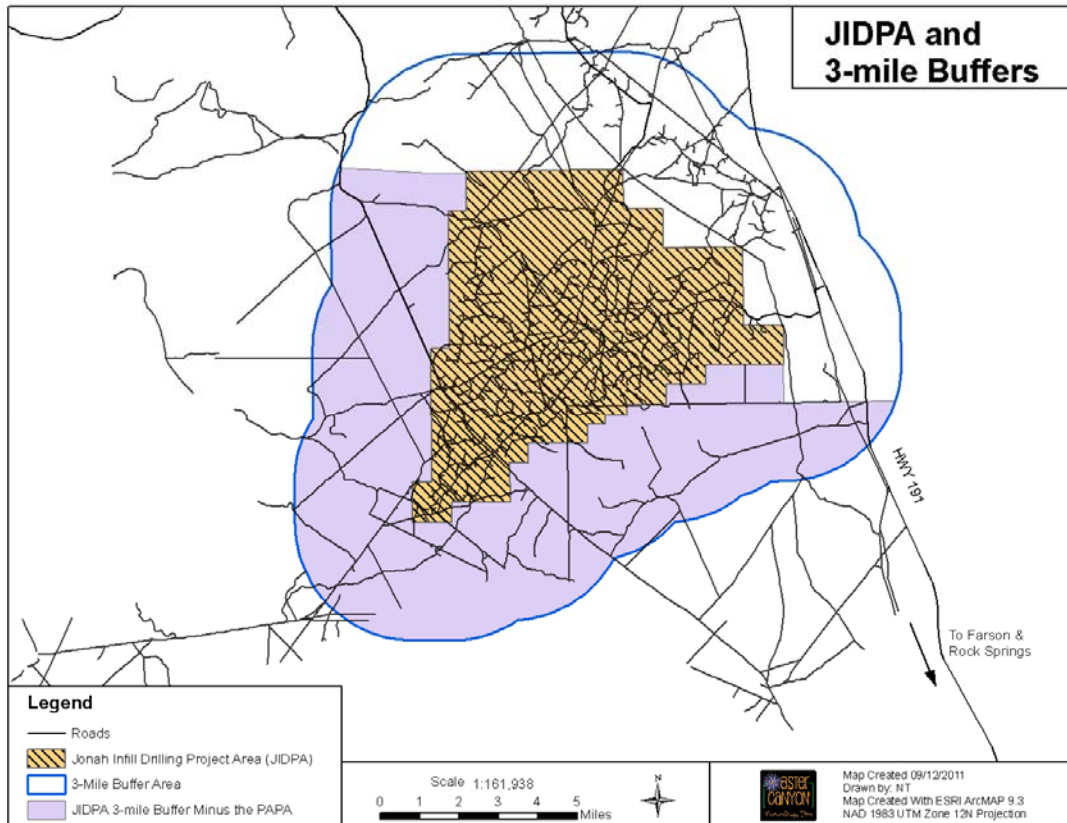
The JIDPA is located in the Upper Green River Basin, and exists entirely in Sublette County, Wyoming. From Pinedale, Wyoming, the JIDPA is situated approximately 32 miles southeast, between United States Highways 191 and 189. The JIDPA is situated almost exclusively (94%) on federally owned public lands. The area has one of the richest concentrations of natural gas in the United States (JIO 2011a). The sagebrush dominated ecosystem that predominated in the JIDPA and surrounding area is critically important to many Wyoming wildlife species. Several of Wyoming's TEPC, SGCN, and WSS depend on sagebrush during some part of their life. Accordingly, the BLM has initiated wildlife monitoring and inventory studies that were recommended under the Environmental Impact Statement (EIS), written in compliance with the National Environmental Policy Act of 1969 (NEPA). Environmental studies commenced in 1996 with Anderson Environmental Consultants, Inc. Inventories from 1997-2005 were conducted by TRC Mariah Associates, Inc. (TRC). No funding was allocated for the project in 2006. From 2007 through 2011, Aster Canyon has been performing inventories and collecting data on the JIDPA and 3-mile buffer.

Study Area

Aster Canyon's 2011 Jonah Infill Drilling Project Area Wildlife Monitoring Report study area includes the JIDPA and a surrounding 3-mile buffer (Map 1). The 3-mile buffer has been eliminated on the north and east sides of the JIDPA since 2009, due to the overlapping study areas with the Pinedale Anticline Project Area (PAPA). Although the north and east sides of the 3-mile buffer have been eliminated for some species, the mountain plover, general wildlife, and fence inventories were conducted throughout the JIDPA and entire 3-mile buffer area in 2011. Inventories and monitoring for the raptors and burrowing owls were conducted in the JIDPA and 3-mile buffer area, minus the PAPA overlap. Landbird inventories were carried out solely within the JIDPA boundary area.

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The JIDPA encompasses approximately 30,500 acres of land in townships 28N and 29N, ranges 107W through 109W. The area consists of shrub-steppe habitat, which is dominated by Wyoming big sagebrush (*Artemisia tridentata* var. *wyomingensis*) and includes: other species of sagebrush (*Artemisia* sp.), rabbitbrush (*Chrysothamnus* sp.), saltbush (*Atriplex* sp.), and a variety of forbs and grasses. It is considered a semi-arid, cold desert climate punctuated with rolling hills interspersed with scattered buttes and rock outcrops. The area is intersected by numerous ephemeral stream channels and washes, but lacks any permanent water bodies. Located within the 3-mile buffer there are livestock water sources and an earthen dam that is filled by a spring. Total precipitation averages 8.0 inches per year, and the elevation ranges anywhere from 7,000 – 7,400 feet above sea level (BLM 2006).



Map 1. 2011 Wildlife Study areas, the JIDPA and 3-mile buffer (mountain plover, fence and incidental wildlife) and the 3-mile buffer minus the PAPA (raptors and burrowing owls).

2.1 Purpose and Objectives

The purpose of the 2011 JIPDA wildlife monitoring was to: identify the wildlife and their resources within the JIDPA and 3-mile buffer, assist land managers and Operators with planning efforts, and to provide data to assist with efforts to maintain desired wildlife population levels. Aster Canyon's monitoring of the study area was done in an effort to provide data that will assist in determining the effects of disturbance on the wildlife and resources therein. This information is intended to: 1) help land managers determine appropriate mitigation and protection measures; 2) provide suggestions for further monitoring; and 3) provide the necessary data to validate and revise the EIS wildlife models and projections. All BLM required spreadsheets, spreadsheets created to assist the Operators, maps, tables and figures can be found in the appendices on the compact disc included with this report.

2.2 Datum and GPS

All Geographic Information System (GIS) locations are projected in Universal Transverse Mercator Coordination System (UTM) Zone 12 north and North American Datum of 1983. Global Positioning Systems (GPS) units used during the survey efforts include: Garmin Rino110, Garmin eTrex Legend, Garmin eTrex Legend HCx, Garmin GPSmap 60CSx, and Trimble GeoXT GeoExplorer 2005 series. Locations were plotted and maps were created using ESRI ArcGIS 9®, ArcMap version 9.1 and 9.3.

2.3 Threatened, Endangered, Proposed, and Candidate Species; BLM Wyoming Sensitive Species; and WGFD Species of Greatest Conservation Need

There are several species on the TEPC species list generated by the USFWS, the BLM WSS list, and the Wyoming Game and Fish Department (WGFD) SGCN list that occur within the JIPDA. These lists can be found 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://gf.state.wy.us/downloads/pdf/SWAP/SpeciesIntroduction.pdf>

The species discussed in the WMP include the following (JIO 2011b): the black-footed ferret, ferruginous hawk, golden eagle, western burrowing owl, mountain plover, landbirds, white-tailed prairie dogs, pygmy rabbit, and greater sage-grouse. All incidental encounters and observations of the species that were not specifically surveyed in 2011 were recorded in the WGFD Wildlife Observation System (WOS) and are included in the Wildlife Observation section of this report.

2.4 Overall Monitoring and Protection Measures

Each species presented in this report has monitoring and protection measures specific to their individual needs. These protection measures, along with additional recommendations, are presented independently in each species' section. However, some protection measures apply to all wildlife within the JIDPA boundaries and its associated 3-mile buffer. Table 1 presents the wildlife protection measures that pertain to all surface disturbance activities occurring in the JIDPA. A recurring theme throughout the individual species' measures is the importance of protecting critical habitat. Resources vital to the success of the JIDPA's fauna include rock outcrops, intermittent stream beds, prairie dog colonies, and un-fragmented sagebrush stands. Two specific areas increasing JIDPA's species diversity are Sand Draw and the rocky outcroppings east of the North Jonah Road in sections 12 and 13.

Aster Canyon suggests that the preservation of vital habitat, such as drainages, waterholes, and rock outcroppings, is important for the persistence of many sensitive

species in the area. Likewise, a mosaic landscape that contains a community of various plants with different structures and ages provides more opportunities for wildlife use and should be maintained. It has also been determined that prairie dogs are an important resource for several species on the JIDPA, as prairie dogs provide food for raptors, as well as habitat for burrowing owls and mountain plovers.

As stated in the ROD, intensive surface disturbance practices on the JIDPA will likely have significant impacts on natural resource values, including wildlife displacement and/or extirpation of local populations. Therefore, mitigation is encouraged to maintain these resources and help 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; the original 24.5 million dollars were funded by EnCana Oil and Gas (USA) Inc. and BP American Production Company. Of the original 24.5 million dollars, 16.5 million dollars were committed to off-site wildlife mitigation while the other 8 million were committed to other positive environmental impacts (JIO 2011a).

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Table 1. Standard protection measures for all surface-disturbing activities in the JIDPA by the species affected areas, the applied restrictions and time frame, and the boundary area for the specified restriction (BLM 2006).

Affected Areas	Applied Restrictions	Restriction Time Frame	Restricted Area Boundaries
Greater sage-grouse leks	No surface occupancy	Year-round	Within 0.25-mile of occupied lek boundary
Greater sage-grouse leks	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	Up to 2-mile radius of active lek or within suitable Nesting Habitat
Winter Greater sage-grouse habitat	No surface-disturbing activity	November 15–March 14	Within identified winter habitat
Greater sage-grouse leks/strutting grounds	Surface occupancy or use restricted or prohibited	March 1-May 15 (8pm to 8 am)	Within 0.25-mile of lek/strutting ground 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 hrs of survey	April 10–July 10	Within potential mountain plover habitat
Bald eagle nest	No surface occupancy	Year-round	Within 2640 feet of active nest
Bald eagle nest	No surface-disturbing activity	February 1–August 15	Within 1-mile radius
Bald eagle winter use areas	No surface-disturbing activity; disruptive activities restricted	November 15–April 1	Within 1-mile radius
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 radius
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 radius
Sand Draw	No surface occupancy	Year-round	Within 300-feet

Organizations interested in mitigation efforts may submit project proposals to the JIO, and the proposed projects must meet criteria described in the funding application guidelines <http://www.wy.blm.gov/jio-papo/applications/applicationguidelines.pdf> . The JIO was created to provide overall management of field monitoring and mitigation activities, both on- and off-site (JIO 2011a).

The Wyoming Landscape Conservation Initiative (WLCI) is another source of funding for wildlife projects. The WLCI is a “long-term science-based effort to assess and enhance aquatic and terrestrial habitats at a landscape scale in Southwest Wyoming, while facilitating responsible development through local collaboration and partnerships” (WLCI 2011).

Wyoming Wildlife and Natural Resource Trust (WWNRT) funding is also available for a wide variety of projects throughout the state, including natural resource programs of other agencies (WWNRT 2011).

Finally, protection measures for TECP, WSS, and SGCN not previously identified are often identified during field reviews by the BLM and operator on-site meetings for Applications for Permits to Drill, Right of Way applications, and in Sundry Notices. When these protection measures are identified, surveys by BLM approved consulting biologists are usually required. Protocols for these species are coordinated with BLM biologists at the time of the survey request.

3.0 RAPTOR

Raptors are an integral part of the sagebrush-steppe ecosystem as they help maintain stable populations of small mammals such as ground squirrels (*spermophilus sp.*) and prairie dogs. This population control regulates herbivory and the overall health of the ecosystem. As many raptor species are sensitive to development and other anthropogenic disturbances, they also serve as excellent indicators of impact disturbance and overall habitat health.

Raptors that are generally found nesting within the JIDPA include ferruginous hawks (*Buteo regalis*) and American kestrels (*Falco sparverius*). This season a golden eagle (*Aquila chrysaetos*) nesting attempt was documented. These raptors are all protected under the Migratory Bird Treaty Act of 1918 (MBTA). The golden eagle is also protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). The ferruginous hawk is a WSS and a SGCN. Based on the habitat found within the JIDPA and 3-mile buffer, it is possible the short-eared owl (*Asio flammeus*) an open country ground nester is nesting in the area. Incidental sightings of raptors utilizing the JIDPA and 3-mile buffer for activities other than nesting can be found in the Wildlife Observation section of this report.

Aster Canyon biologists monitored raptor nesting activity within the JIPDA and 3-mile buffer minus the Pinedale Anticline Project Area (PAPA) from 15 April to 4 August 2011 with the following objectives: monitor previously recorded raptor nests and determine activity/nesting success, search for new nests, and quality control the BLM official raptor nest database. Aster Canyon's monitoring effort will help Operators remain in compliance with the MBTA and assist with planning efforts. Monitoring raptor activity also provides real-time data to give nesting raptors protection buffers as soon as possible. Real-time reporting was submitted to the Operators, BLM, and JIO after each survey round.

3.1 Raptor Methods

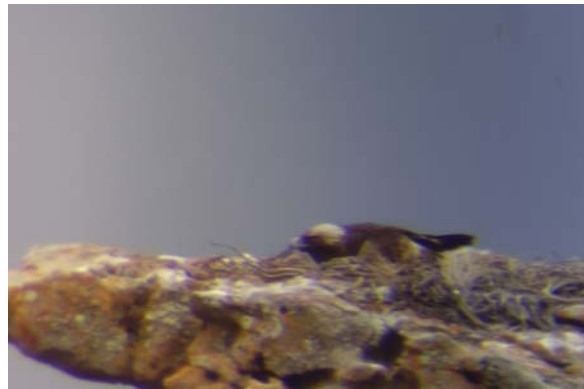
During the 2011 field season, nest surveys were performed as per *The Raptor Survey Protocol* within the Wildlife Survey Protocols, Pinedale Field Office Version 2.3, and the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project*. The BLM required spreadsheets were used to enter all monitoring data.

Monitoring consisted of 2 rounds of nest surveys and additional productivity survey for all active nests. Each round of surveys took place at least 1 month apart. A total of 140 locations were received from the BLM and were surveyed during the 2011 nesting season.

A change to the BLM raptor survey protocol was made this season that allowed the researcher to use “NA” or *Not Applicable* in database fields if a nest location was deemed faulty. This was useful to separate and remove incorrect data from accurate nest location data.

3.2 Raptor Results

Of the 140 nests surveyed, 32 were deemed to be faulty, leaving 108 accurate nest locations that were monitored. No new unrecorded raptor nests were located on the JIDPA or 3-mile buffer minus the PAPA. A location was determined to be faulty after an observer visited the site and found that a raptor nest never existed there. This was usually found to be true when a site was located in an area where a raptor would not likely nest or it was a duplicate recording of another recorded nest. After a nest location was classified as a faulty location, it was



Sub-adult golden eagle in an incubation posture within the JIDPA.

not surveyed in further rounds. Thirty-one faulty nest locations were stricken from surveys in round 1. One nest, 291090202, was surveyed multiple times and was ultimately found to have been an old songbird nest in a tall sagebrush bush. In total, 108 legitimate raptor nests were surveyed during the 2011 nesting season. Appendix A-6 contains all nest locations, occupied nests, active nests, and the corresponding protection buffers. All BLM required activity and summary spreadsheets containing specific monitoring data can be found in Appendix A. In addition to the BLM required spreadsheets Appendix A also contains spreadsheets for the Operators to assist with planning.

Six raptor nests were considered occupied in the JIDPA and 3-mile buffer minus the PAPA, 2 ferruginous hawk nests (291073301 & 291073201), 3 American kestrel nests (291081209, 291081305, & 291081307), and 1 sub-adult golden eagle nest (291081315). Three of these nests were also considered active, 2 ferruginous hawk nests (291073301 & 291073201) and 1 golden eagle nest (291081315). An active nest is defined by the BLM protocol as a nest that had a breeding attempt, while occupancy is defined as adult presence at or near a nest. Table 2 summarizes the 2011 raptor nesting season.

Table 2. Summary of the 2011 raptor monitoring season on the JIDPA and 3-mile buffer minus the PAPA.

Species Monitored in 2011	Total Number Nests	Number Occupied	Number Active	Number Hatch Successful	Number Fledge Successful
American Kestrel	23	3	0	0	0
Ferruginous Hawk	83	2	0	2	2
Golden eagle	1	1	1	0	0
Unknown Raptor	1	0	0	0	0
Total					



Ferruginous Hawk

Ferruginous hawk nests, 291073301 and 291073201, successfully hatched and fledged young at both nest sites. Both nests are located on the artificial nesting structures south of the JIDPA in the 3-mile buffer.

American kestrel

Three occupied American kestrel nests were observed this season (291081209, 291081307, and 291081305). These were deemed occupied during the round one survey in May and the round two survey in June. However, no activity was observed at these locations during productivity surveys conducted in July. It is unclear whether these nests fledged before the productivity surveys or if a nesting attempt ever occurred. This is largely because these nests are located in high rock cavities and could not be safely checked for evidence of nesting by an Aster Canyon biologist.

Golden Eagle

A sub-adult golden eagle was observed incubating within the JIDPA this season at nest 291081315. This nest site was originally used by a ferruginous hawk but the last documented successful nesting occurred there in 1997. The nest is in remnant condition (only a few sticks) and was not built on by the incubating eagle. The nest was deemed active and occupied 23 May. However, on 6 June the eagle was not observed at the nest site. It is unclear why the sub-adult female abandoned the nest site, but productivity surveys of the nest on 14 July showed no evidence of any egg shells or new nesting material.

3.3 Raptor Discussion

In summary, of the 140 raptor nest locations received from the BLM, 32 were faulty or duplicates and the remaining 108 were legitimate nests in various conditions. A total of 6 occupied nests were identified; 3 American kestrel, 2 ferruginous hawks, and 1 golden eagle. Both ferruginous hawk nests succeeded in fledging juveniles, the sub-adult golden

eagle nesting attempt failed, and it is unknown whether the American kestrel nests were successful or not.

As mentioned before, it is unclear whether nesting attempts occurred in any of the 3 occupied American kestrel nests and if so, their success. Surveying nesting activity for kestrels is a fairly difficult task. They will often nest in rock formations containing many cavities and holes that could serve as adequate nest sites. Given the high number of potential nest cavities in an area and the inconspicuous nature of incubating female kestrels, it is difficult to observe these nests from a distance that will not disturb potential nesting attempts. Due to these reasons, Aster Canyon was not able to confirm hatch or fledge success for any of the occupied American kestrel nests.

The artificial nesting structures are serving as excellent nesting sites for ferruginous hawks as the 2 structures, 291073301 & 291073201, have housed successful nesting attempts annually for 4 and 5 years respectively. These artificial nesting structures are located in the 3-mile JIDPA buffer and are fairly isolated from most activity, and are currently the only ferruginous hawk nests being utilized. The success and productivity of these artificial nesting structures, or any others, could be compromised if drilling and development begin to encroach on the ferruginous hawks and their nest sites.

As drilling production begins to wind down in the JIDPA over the next several years, we may begin to see an increase in nesting raptors in the area. The decreased human presence and nest disturbance potential should make the area a more suitable habitat for raptors to nest. The unexpected nesting attempt by a sub-adult golden eagle, although brief, suggests that with a decrease in disturbance raptor nesting will increase. There has been no documented golden eagle nesting in the JIDPA or 3-mile buffer minus the PAPA in recent past. Quick identification of nesting raptors and implementation of appropriate protection buffers combined with the decrease in drilling activity on the JIDPA should help to protect and eventually increase nesting raptor events in the future.

Trends over the past monitoring years cannot be accurately evaluated due to various reasons. These include; different study areas over the years, the use of multiple protocols, and UTM locations of nests before 2007 are unavailable to Aster Canyon. Wildlife monitoring has taken place within the JIPDA since 1998, however, Aster canyon has only been performing wildlife monitoring on the JIPDA since 2007. To view past monitoring reports and results please visit the JIO website at <http://www.wy.blm.gov/jio-papo/jio/monitoring.htm>. Based on Aster Canyon's experience and knowledge it is predicted that populations of ferruginous hawk and American kestrels will remain stable with continual protection of the rock outcroppings and artificial nesting platforms.



A golden eagle often observed hunting in the JIDPA and 3-mile buffer.

4.0 BURROWING OWL

The burrowing owl (*Athene cunicularia*) is by far the most common owl species observed in the JIDPA and 3-mile buffer. These small, long-legged owls are known for living in underground burrows usually constructed by prairie dogs or other mammals. The burrowing owl migrates into the region in the spring to nest in the sagebrush-steppe ecosystem that dominates the JIDPA and surrounding BLM managed land. The burrowing owl is a WSS and a SGCN and protected under the MBTA.

Aster Canyon biologists monitored burrowing owl nesting activity within the JIPDA and 3-mile buffer minus the PAPA from 2 May to 30 August with the following objectives: monitor previously recorded burrowing owl nests and determine activity/nesting success, quality control the BLM official raptor nest database, and search for new unrecorded nests. After each round of monitoring, data and reports were submitted to the Operators, BLM, and JIO for real-time reporting. The following describes the methods, results, and discussion for the entire 2011 nesting season.

4.1 Burrowing Owl Methods

During the 2011 field season, nest surveys were performed throughout the JIDPA and 3-mile buffer minus the PAPA. The *Raptor Survey Protocol* and *Burrowing Owl Survey Protocol* within the Wildlife Survey Protocols, Pinedale Field Office Version 2.3 and the *Wildlife Monitoring Plan for the Jonah Infill and Drilling Project* were followed when performing these surveys. The Pinedale BLM required spreadsheets were used to enter all monitoring data.

Nest monitoring consisted of 3 rounds of nest surveys, and productivity surveys of all active nests. Productivity surveys were performed to determine hatch and fledge status. Each round of surveys took place at least 1 month after the previous survey. Productivity surveys took place more often. A total of 58 nest locations were received from the

Pinedale BLM and were surveyed in addition to the 6 new nests recorded during the 2011 nesting season.

A change to the BLM raptor and burrowing owl survey protocol was made this season that allowed the researcher to use “NA” or *Not Applicable* in database fields if a nest location was deemed faulty. This was useful in separating and removing incorrect data from accurate nest location data.

4.2 Burrowing Owl Results

Of the 58 nest locations received from the BLM, 2 were deemed to be faulty, and one location was a common raven (*Corvus corax*) nest located on a well pad. After a nest location was classified as a faulty location, it was not surveyed in further rounds.



An adult burrowing owl perched within the JIDPA.

Six new burrowing owl nests were discovered by Aster Canyon biologists this season (281093303, 291073103, 291081402, 291081605, 291083501, & 291083607) through walking prairie dog towns and while surveying existing nest sites. Including all of the new nests, a total of 61 legitimate nests were surveyed during the 2011 season.

Of these 61 burrowing owl nests, 10 were found to be occupied by burrowing owls (281093303, 291073102, 291073103, 291081402, 291081605, 291082304, 291082403, 291083202, 291083501, & 291083607). Eight of these nests were found to be active burrowing owl nests and 7 of these nests successfully fledged young (Table 3). Occupied is defined by the BLM protocol as an adult presence at or near a burrow or sign at or near a nest, while an active nest is defined as a nest that had a breeding attempt. The BLM protocol does not define fledge. Aster Canyon defines fledged for burrowing owls as

when fully feathered young voluntarily leave the nest for the first time (Bird and Bildstein 2007).

Nest 281093303 was considered occupied and active but is it unknown whether the adult pair successfully laid eggs. Nests 291081605 and 291073102 were considered occupied during the nesting season but never became active. At nest 29108160 a single owl was observed on 2 consecutive days in mid-June and then it abandoned the nest. White wash was observed at nest 291073102 during the first round of surveying but no owls or sign was ever seen again at this nest. Locations of all burrowing owl nests, occupied and/or active nests, and their associated protection buffers can be found in Appendix B-6. All 3 BLM required spreadsheets; location, activity, and summary containing specific monitoring data can be found in Appendix B. In addition to the BLM required spreadsheets Appendix B also contains spreadsheets for the Operators to assist with planning.

On 15 August 2 nests (291083303 & 291081402) were still active and occupied by adult owls. Chicks had not been seen at these nests as of 15 August. Aster Canyon continued to monitor these nests after the 15 August data collection deadline to determine if chicks were hatched successfully. Nest 291081402 successfully fledged chicks, it is undetermined if the pair at nest 291083303 laid eggs or successfully hatched chicks.

Trends over the past monitoring years cannot be accurately evaluated due to various reasons. These include; different study areas over the years, the use of multiple protocols, and UTM locations of nests before 2007 are unavailable to Aster Canyon. Wildlife monitoring has taken place within the JIPDA since 1998, however, Aster canyon has only been performing wildlife monitoring on the JIPDA since 2007. To view past monitoring reports and results please visit the JIO website at <http://www.wy.blm.gov/jio-papo/jio/monitoring.htm>.

Table 3 below summarizes the 2011 burrowing owl nest monitoring season in the JIDPA and 3-mile buffer minus the PAPA, along with 2010 and 2009 seasons. The study area of the JIPDA was the same during these years

Table 3. Summary of burrowing owl monitoring results 2009-2011

	Total number of nests	Number Occupied	Number Active	Number Hatch Successful	Number Fledge Successful
2011	61	10	8	7	7
2010	51	12	11	7	7
2009	38	*	6	2	2

* In the BLM protocol required in 2009 Occupancy was not a term that was used.

4.3 Discussion

Of the 58 raptor nest locations received from the BLM, 2 were faulty and one was a common raven nest, and the remaining 55 were legitimate nests with burrows in various conditions. Six newly discovered nests were recorded. A total of 10 occupied nests were identified with 8 nests considered active. Seven nests successfully fledged young. These results are similar to the 2010 results with 12 occupied nests and 7 successfully hatching and fledging young.

The Jonah ROD provides seasonal restrictions for surface-disturbing activities from 1 February through 31 July, within 0.5 mile of all active raptor nests. The ROD also states: The seasonal buffer distance and dates may vary, depending on such factors as the activity status of the nest, species involved, prey availability, natural topographic barriers, line-of-site distance(s), and other conflicting issues such as cultural values, steep slopes, etc. (BLM 2006).

Little is known on specific dates of arrival and departure of burrowing owls on their breeding ground, specifically in western Wyoming. However, burrowing owls are generally found on the northern breeding grounds from mid-March to September (Poulin et al. 2011). Aster Canyon has recorded owls on the JIPDA as early as 4 April in 2008; the burrow was filled with snow 2 days before the owl arrived. This year, 2011, has been the latest that Aster Canyon has observed chicks emerge from a nest location.



This year 2 new burrowing owl nests (281093303 and 291081402) were located on the JIDPA in late July. As of 15 August it was unknown whether these burrowing owls had laid eggs even though these nests had been surveyed 4 and 5 times, respectively. Aster Canyon continued to monitor these nests and on 18 August the top of a chick's head was observed at the entrance to the burrow of 291081402. On 23 August, 2 chicks were observed at this location fully fledged and capable of flight.

On 30 August, after surveying nest 281093303 a total of 8 times it was undetermined whether this nest produced eggs. It is likely that this pair did produce eggs based on the pairs' observed behavior. Pairs that do not lay eggs spend less time near a nest as the breeding season progresses (Bird and Bildstein 2007). Even late into the breeding season 1 adult or the pair was seen at the nest.

It may be possible that these 2 nests were re-nesting attempts. If a burrowing owl nest is predated early in the breeding season a second nesting attempt could take place (Paulin 2011). Catlin and Rosenberg 2008 found that burrowing owls may re-nest in the same burrow or they may disperse .09 miles to 8 miles. In a 2005 study, burrowing owls dispersed .06 miles to .25 miles for a re-nesting attempt (Catlin et al. 2005).

Aster Canyon recommends that adaptive management tools continue to be used to evaluate nest protection on a case by case basis. The weather of a particular year can be evaluated to determine if late snow melt has kept owls from using burrows until later in the nesting season. Real-time reporting can be analyzed to determine if a nest is a late nest or whether it is possible a re-nesting attempt has occurred. Nest initiation dates and biology of burrowing owls should be considered.

During monitoring surveys for nest 291083501 dead prairie dogs were discovered that were shot nearby. Despite this disturbance this nest successfully fledged young. Recreational shooting of prairie dogs can negatively effect burrowing owl populations.

To avoid this negative effect prairie dog hunters should be educated on how to identify burrowing owls and informed that prairie dog towns with burrowing owls should be avoided (McDonald et al. 2004). There are multiple channels of communication that this information could be shared with the public; newspapers, hunter safety courses, and WGFD hunting regulations.

5.0 MOUNTAIN PLOVER

The mountain plover (*Charadrius montanus*) is a migratory shorebird that breeds in open, dry areas of the 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 nearly 3,400 individuals, possibly 30% of the total mountain plover population (Plumb et al. 2005), are present in the state during migration and throughout the breeding season.

There is evidence that mountain plover populations have experienced large-scale declines over the past century (Drietz et al. 2006) and suffered significant drops from the 1960's to the 1990's (Knopf & Rupert 1996). Population declines and concerns regarding habitat loss, have led to the mountain plover to be proposed for listing under the ESA. The mountain plover was first considered as a candidate species for federal listing in 1993 after sufficient evidence for its 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 the bird unwarranted for protection. Most recently, a 2010 proposed rule to relist the mountain plover as a federally threatened species was withdrawn by the USFWS on May 12, 2011 after it was determined that the plover was not threatened or endangered throughout a significant portion of its range (USFWS 2011).



Mountain plover adult in Wyoming Photo by J. Brauch

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 mountain plover habitats within the JIDPA and the 3-mile buffer during a period from 2 May 2011 to 13 June 2011. A total of 3 survey rounds were performed to determine presence of mountain plovers within pre-determined mountain plover habitats. The results of those surveys were reported to the BLM, JIO, and Operators in real-time, following the conclusion of each round. The information presented in this section of the report is a summary of results from the 2011 mountain plover nesting season.

5.1 Mountain Plover Methods

Surveys were conducted based on methods outlined in the *Mountain Plover Survey Protocol* within the Wildlife Survey Protocols, Pinedale Field Office Version 2.3. This protocol was adapted from the U.S. Fish and Wildlife Service's mountain plover survey guidelines (USFWS 2002). The large scale/long term project mountain plover survey protocol was utilized. The mountain plover survey summary form, survey codes, and associated survey spreadsheet were used to collect data for each habitat visit during surveys.

A total of 27 previously identified mountain plover habitats within the JIDPA and 3-mile buffer were surveyed once per round for a total of 3 rounds during the breeding season. These habitats can be seen in Appendix C-3. Each round was separated by at least 14 days and surveys were conducted from 2 May 2011 through 13 June 2011. 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 to 10:00 am. However, surveys were started up to 15 minutes before official sunrise if sufficient light conditions allowed for efficient surveying. Surveys 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 the observer to detect mountain plovers.

Surveys were conducted from within a vehicle that remained on existing roads and two-tracks, in order to reduce disturbance to the birds. Binoculars were used primarily for scanning purposes and spotting scopes were employed to confirm sightings as well as to scan distant parts of habitats that could not be seen clearly using binoculars. Surveys were conducted with the vehicle turned off and windows rolled down to facilitate audible detection of mountain plovers. During the first survey round, playbacks were employed to illicit a behavioral response from non-paired mountain plovers or territorial mountain plovers. Playbacks were broadcast only after an initial scan of a habitat resulted in no sighting, were used minimally during the second round of surveys when habitats could not be scanned entirely, and were not used during the third round to avoid disturbance to nesting mountain plovers.



Adult mountain plover observed in the JIDPA 3-mile buffer.

Habitats were not searched for nests since they are extremely difficult to find on foot and might disturb nesting mountain plovers. Sightings were documented by marking the observer waypoint and, when possible, recording the distance (m) and compass bearing (degrees) in order to estimate the actual mountain plover location without leaving the vehicle to mark a more accurate waypoint. Notes regarding observed behavior were also recorded at the time of mountain plover sightings.

As requested by the JIO and BLM biologists, the north and east portions of the JIDPA 3-mile buffer were searched for any likely mountain plover habitats. This was done by first searching the aerial imagery of this area for any area of sparse vegetation. On 3 May

2011 an Aster Canyon biologist searched this area by driving all roads and two-tracks to search for new potential habitat. There was no potential habitat found at that time. However, during the survey period additional potential habitats were identified within the JIDPA 3-mile buffer to the south and west of the JIPDA. These habitats were assigned temporary identification numbers using the acronym JMPH (Jonah Mountain Plover Habitat) and a sequential digit. These habitats are listed in the Appendix C-2.

5.2 Mountain Plover Results

During 2011 surveys, a total of 13 adult mountain plovers were observed in 7 sightings within 5 different JIDPA habitats during the 2011 breeding season surveys (Appendix C-3 and Table 4). Sightings represent individual observation events where 1 or more mountain plovers were detected. The adult mountain plovers were detected during survey rounds in previously identified JIDPA habitats 1, 15, 24, 26 and 29. Table 4 provides a summary of mountain plover sightings:

Table 4. 2011 mountain plover survey sightings in the JIPDA and 3-mile buffer by date

Sighting #	Date	Habitat (Plot) ID	Adult	Juvenile
1	5/3/2011	29	1	0
2	5/4/2011	26	4	0
3	5/17/2011	1	2	0
4	5/18/2011	26	2	0
5	6/6/2011	15	1	0
6	6/7/2011	24	1	0
7	6/13/2011	29	2	0

Note: One additional sighting of one adult mountain plover with a single chick occurred on 7/27/11 in undocumented habitat JMPH7.

One sighting of a single adult and a chick mountain plover were encountered on a relatively barren pipeline in the JIDPA 3-mile buffer which is not a delineated habitat. This habitat is recorded as a potential habitat (JMPH7) in Appendix C-1 and C-2. The sighting is included in the 2011 map of mountain plover sightings (Appendix C-3.) and can be found in the southwest corner of the JIDPA 3-mile buffer. This sighting is

included in the BLM sighting spreadsheet (Appendix C-1) and not recorded in the Wildlife Observation section. This was the only sighting in 2011 where a chick was detected. This was also the only sighting that was made outside of the 3 survey rounds and it occurred on 27 July 2011; late in the breeding season. The observed chick was young, still covered in down feathers and incapable of sustained flight.

Several new potential mountain plover habitats were identified within the JIDPA 3-mile buffer this season. These new habitats were detected during on-ground surveillance activities and should be assessed for quality in 2013 as per the WMP. The temporary identifications and central waypoints for these new habitats are listed in Appendix C-2.

5.3 Mountain Plover Discussion

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

A critical habitat in the JIDPA and 3-mile buffer can be defined as an area of high quality habitat that has been demonstrated to host breeding mountain plovers by multiple sightings, particularly surveyed habitats 1, 6, 26, 27, 28, 29 & 30. These habitats are known to support mountain plovers and play a role in maintaining the local population. We recommend that critical habitats in the JIDPA and 3-mile buffer, particularly the habitats listed above, be protected from disturbance and that disturbance be minimized when possible in order to maintain mountain plover breeding areas.

Since 2000, there have been a total of 68 mountain plover sightings occurring in 11 habitats identified within the JIDPA and 3-mile buffer. These habitats include 1, 6, 10, 15, 18, 24, 26, 27, 28, 29, and 30. The earliest year for which we have sighting records occurring within the JIDPA and 3-mile buffer areas was in 2000 (Table 5 and Appendix C-4). It should be noted that these observations do not represent trend, as methodologies have not been standardized or adjusted for observer effort, so the data provided for previous years should be used for mountain plover observed presence purposes only.

Table 5. Summary of mountain plover sightings by year in the JIDPA and 3-mile Buffer, 2000-2011

Year	# Sightings	Habitats
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, JMPH7*

JMPH7 is not a previously recorded habitat and has not been delineated.

Studies indicate that mountain plovers may utilize several different habitats throughout the breeding season (Schneider et al. 2006). It is important to protect habitats occupied by mountain plovers during migration, courting, nest site selection and broods rearing which all play a role in the production of young. These habitats may not necessarily be characterized by the same vegetative structure and may be comprised of higher amounts of vegetative cover in areas utilized by chicks (Schneider et al. 2006). It has also been indicated that mountain plovers require large habitats (>160 contiguous acres) to nest and raise their young (Smith and Keinath 2004, Post van der Burg et al. 2011). While it is especially important to protect large areas of high quality habitat, adjacent medium quality or small areas can serve as extensions of those habitats and, therefore, may also warrant protection.

Vegetative height and the percentage of bare ground, both key factors influencing suitable mountain plover habitat, can also be greatly affected by industry development. In western Wyoming, mountain plovers require habitat with significant bare ground and short or no vegetation (Smith & Keinath 2004).

Industrial activities involving ground disturbance and the development of roads create conditions under which exotic plants may invade. Introduction of tall or dense-growing vegetation can establish and create conditions that would 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.

The reclamation process should be monitored to ensure that reclamation results are progressing towards final reclamation criteria as per the Jonah Reclamation Monitoring Plan (JIO 2008).



Mt. Plover nest photographed in south-central Wyoming, photo by J. Brauch.

Habitat Delineation

Several mountain plovers that were detected during surveys this season were observed outside of current habitat borders. Current plans for habitats to be re-evaluated and re-delineated in 2013 will reflect more accurate boundaries and facilitate improved management in future years. Several potential undocumented mountain plover habitat areas were identified within the Jonah 3-mile buffer area this survey season. The locations of these new habitats were included in this report so that they may be addressed when habitats are assessed in 2013. It is recommended that delineation efforts be accomplished with the use of imagery, such as aerial photography or National

Agriculture Imagery Program imagery, coupled with on-ground investigation of vegetative structure to confirm the extent of suitable habitat.

Recommendations for Improving Surveys

Data sheets for mountain plover surveys should be updated and the contents re-evaluated to better satisfy survey objectives. It is recommended that the fields included on the data sheets for the condition and status of mountain plover nests or the number of eggs present be removed. This information does not apply to presence/absence surveys for mountain plovers. Additionally, the acquisition of this information would require a nest search which, for this species, requires intensive observation of adults that leads observers to their highly inconspicuous nests. Confirmation of nests would require an observer to exit their vehicle and result in unnecessary disturbance to nesting birds. Instead, it is encouraged that data sheets provide fields for recording behavioral observations regarding courting or nesting behavior. Another recommendation would be to improve the accuracy with which mountain plover sighting locations are recorded. Fields including observer waypoint (and datum), compass bearing and distance in meters could be added to the field data sheet and used to calculate mountain plover locations. This location estimation method does not require the observer to exit their vehicle, thus reducing disturbance to mountain plovers.

One major challenge when conducting mountain plover surveys in this area is that access to the 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. Detecting mountain plovers from a distance in these situations can be aided by the use of a spotting scope in addition to binoculars. However, many areas are not visible from roads or two-tracks. It is possible that the number of mountain plover sightings is significantly reduced as a result. One option might be to use off-road ATVs to access habitats inaccessible by roads. Mountain plovers often do not flush from nests until vehicles are within several meters and the use of an off-road vehicle would likely increase the chance of detection but having the ability to traverse habitats. This option would allow surveys to be more thorough but would also be more time consuming.

Conversely, employing all terrain vehicles (ATVs) for surveys would increase disturbance for breeding mountain plovers whereas the use of a vehicle that remains on established roads would cause less disturbance for mountain plovers and other animals. There is a trade off between survey options which should be weighed and compared to survey goals before protocols are altered.

The current protocols required for mountain plover surveys in the JIDPA and 3-mile buffer are meant for determining presence/absence of mountain plovers but not density of nesting mountain plovers. Therefore, calculating meaningful trends regarding the local mountain plover population is difficult or impossible to achieve. Data collection methods should be standardized for quality control and it is also important to recognize the limitations of data collected by numerous observers where observer bias and varied skill levels may play a role. Wildlife and land managers, as well as the contractors who collect the information, may consider improving communication regarding details for data collection and evaluation methods. For example, in order to produce valid trend information it would be helpful for the field data sheets to require more detailed information, such as start and end times for all surveys conducted at each habitat. This information could be used to create a suitable denominator to calculate trends using data such as [total # birds detected/count hour]. The current historical data that is available lacks standardized records of surveyor effort so a scientifically sound analysis of trend cannot be produced. Instead, we provide in this report a map of recorded non-standardized sightings dating back to the year 2000 in Appendix C-4.

With collaborative effort in revamping survey data collection procedures for mountain plovers it may be possible to improve the quality and validity of the data produced and obtain superior results. This may lead to improved management of mountain plovers in the JIDPA and 3-mile buffer that could benefit both the species and industry and would contribute to broad-scale efforts to monitor mountain plover populations.

6.0 LANDBIRDS

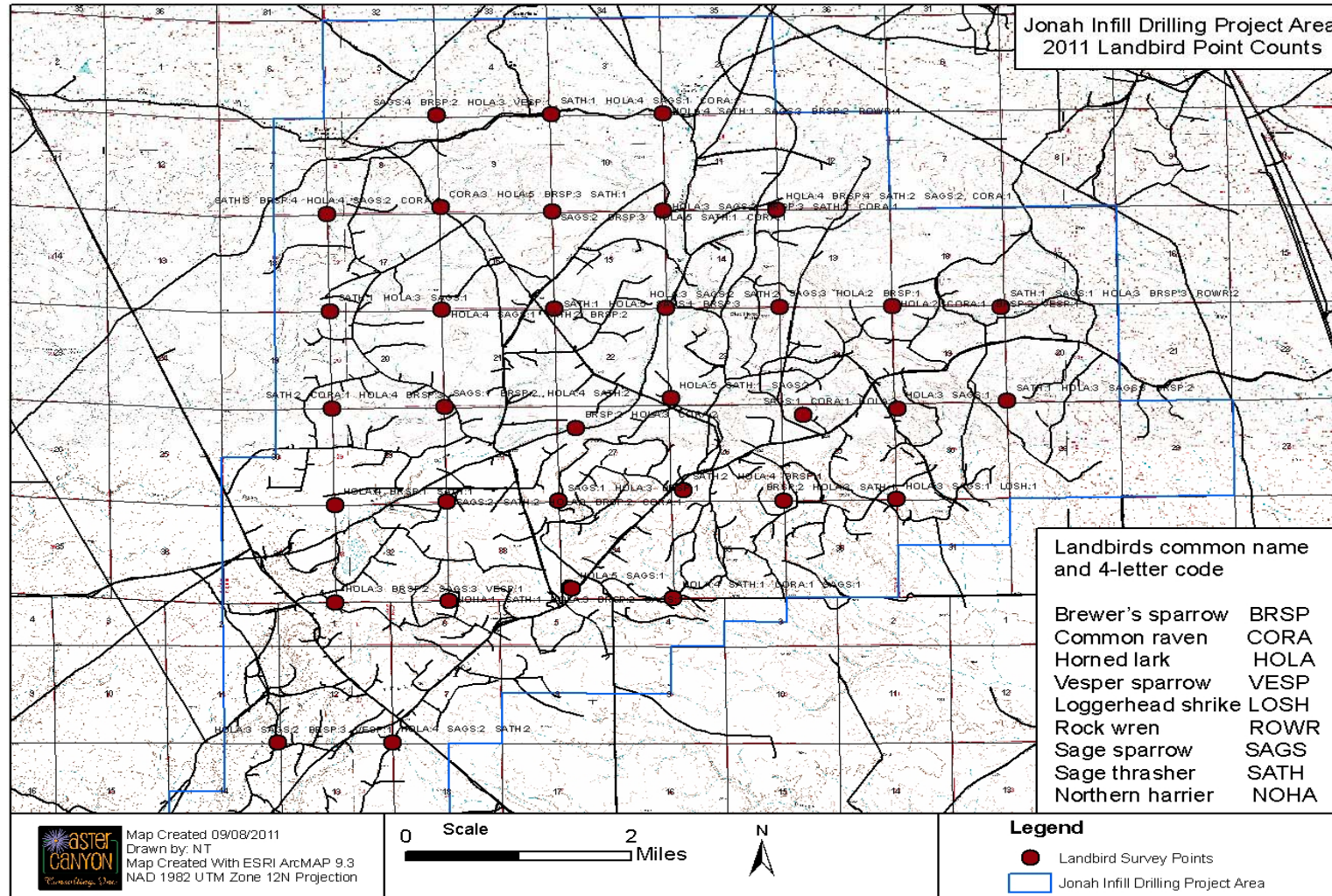
Birds discussed in this section are all migratory birds and therefore protected under the MBTA. Under the MBTA, the BLM and its leaseholders have a legal obligation to protect species of migratory birds, which occur on lands under federal jurisdiction. Executive Order (EO) No. 13186, ordered in 2001, directs agencies to take additional actions to execute the MBTA. To comply with the EO, the BLM, in cooperation with the USFWS, has developed and uses principles and practices that minimize the amount of unintentional take of migratory birds. Particularly focusing on species of concern: conserving, enhancing and restoring habitats; and assessing risks to migratory birds.

The objective of the landbird surveys was to calculate relative abundance and diversity of bird species on the JIDPA. Primarily this survey targeted the clade group of birds known as Passeriformes, commonly referred to as perching birds, half of which are songbirds.

6.1 Landbird Methods

The Handbook of Field Methods for Monitoring Landbirds (Ralph 1993(Appendix D-3)) along with the Rocky Mountain Bird Observatory (RMBO) protocol was used to design the 2010 landbird study on the JIDPA (Appendix D-2). This entailed that point counts be established systematically throughout the JIDPA to be surveyed once during the season. This same established protocol was utilized in 2011.

Thirty-four point count survey locations were established at the corners of each section within the JIDPA boundary (Appendix D-4). Surveys were performed within a half hour of sunrise until 9:00 am. Each point count consisted of 2 consecutive 3-minute intervals where all birds heard or seen, including flyovers, were recorded. Weather data including temperature and wind speed were collected and estimates of precipitation and cloud cover were recorded on a percent scale 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. An example data sheet can be found in Appendix D-1.



Map 2. Landbird point count locations and species recorded



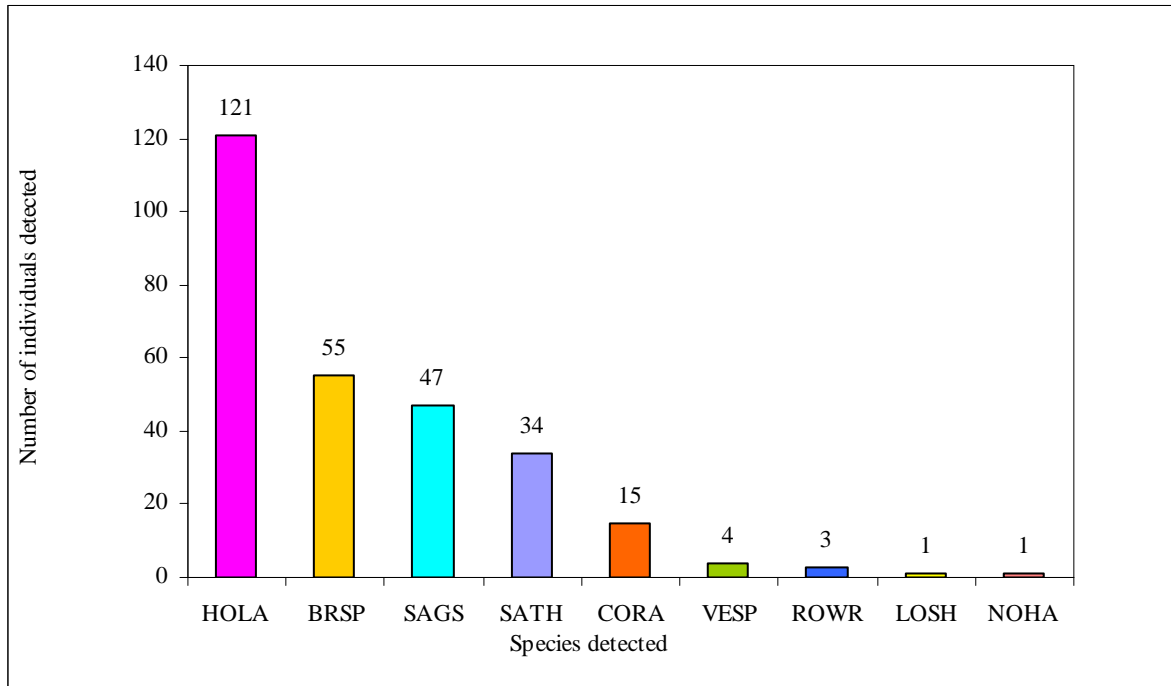
6.2 Landbird Results

The results presented here include relative abundance of landbirds detected, species detections over time, and species diversity. Two hundred and eighty-one individual birds, comprised of 9 species were detected on the JIDPA (Figure 1 and Table 6). Four species were predominant; horned lark (*Eremophila alpestris*), sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*), and Brewer’s sparrow (*Spizella breweri*). 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, and 8.2 birds/point in 2011.

Table 6. Landbird species detected on the JIDPA during 2011 surveys: common name, 4 letter code, and scientific name.

COMMON NAME	FOUR LETTER CODE	SCIENTIFIC NAME
Brewer’s sparrow	BRSP	<i>Spizella breweri</i>
Common raven	CORA	<i>Corvus corax</i>
Horned lark	HOLA	<i>Eremophila alpestris</i>
Vesper sparrow	VESP	<i>Charadrius vociferous</i>
Loggerhead shrike	LOSH	<i>Lanius ludovicianus</i>
Rock wren	ROWR	<i>Salpinctes obsoletus</i>
Sage sparrow	SAGS	<i>Amphispiza belli</i>
Sage thrasher	SATH	<i>Oreoscoptes montanus</i>
Northern harrier	NOHA	<i>Circus cyaneus</i>

Figure 1. Landbird species detected on the JIDPA 2011.



When detections were compared with past data, the results from 2007-2011 were similar to each other. The same 4 species were predominant in 2011 even with a smaller sample size than in 2007 and 2008 when large intensive studies were performed (34 points in 2010 and 2011, versus 225 points in 2007 and 2008) (Figure 2). These findings for the most commonly detected species are described in detail below.

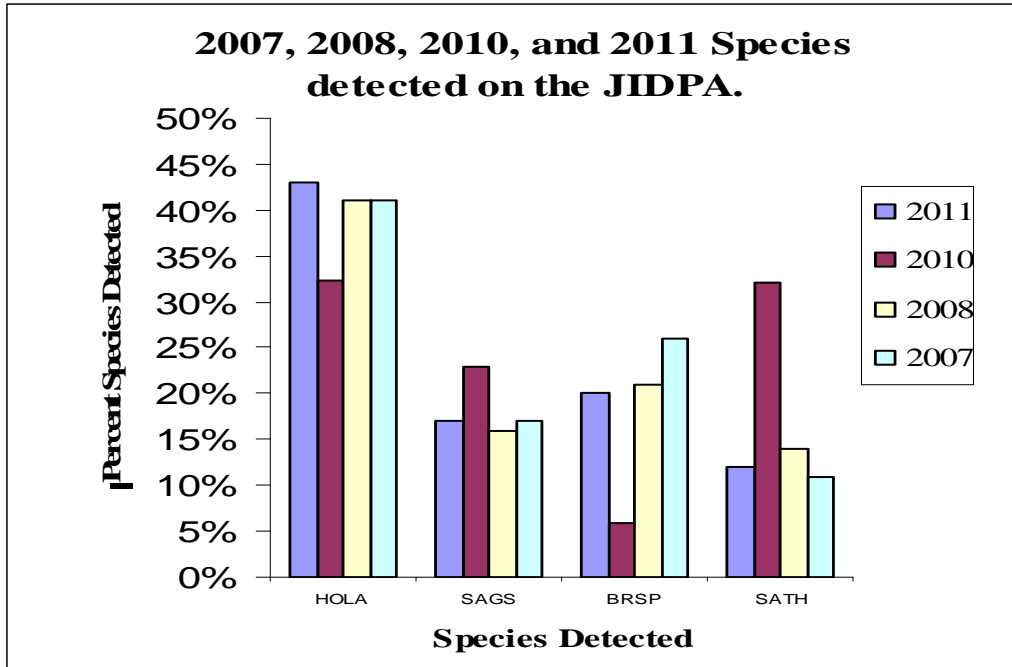
Sage Thrasher (SATH): Thirty-four SATH’s were detected, comprising 12% of total landbirds. They were detected at 68% of the points. This is a 26% decrease compared to 2010 results.

Horned Lark (HOLA): One hundred and twenty-one HOLA’s were detected, comprising 43% of total landbirds detected. They were detected at 100% of the points in 2011.

Sage Sparrow (SAGS): Forty-seven SAGS were detected, 17% of the total landbirds detected. This was a slight decrease from 2010.

Brewer’s Sparrow (BRSP): Fifty-five BRSP were detected, 20% of the total landbirds detected. They comprised 26% in 2007, 21% in 2008, and 6% in 2010.

Figure 2. Landbird species detected on the JIDPA in 2007, 2008, 2010, and 2011.



6.3 Landbird Discussion

It is important to monitor populations of sagebrush obligate species listed as WSS and SGCN such as; sage sparrow, sage thrasher, Brewer’s sparrow, and loggerhead shrike. These species are listed as WSS and SGCN due to population declines throughout their ranges. Their populations are monitored nationally by the breeding bird surveys. In this section relative abundance of landbirds, species detection over time, and species diversity is discussed.

Abundance

Sage sparrows, Brewer’s sparrows, and horned larks were the most abundant birds, comprising 17%, 20%, and 43% of all detections of the 2011 monitoring season, respectively. Horned larks prefer habitat of sparse, short vegetation and barren ground

making the JIDPA road right-of-ways, well pads, and pipelines an ideal habitat for the horned larks (Beason 1995).

Overall, it appears that the results of this year's surveys are similar to those found last year. However, this year showed a much higher abundance of horned larks and fewer sage thrashers. Additionally, vesper sparrows were identified in survey points on the periphery of the JIDPA.

Diversity

Species diversity was similar in 2010 and 2011 but lower than 2007 and 2008. This is likely due to less intensive studies performed in 2010 and 2011. Larger study areas were sampled in 2007 and 2008 and not required in 2010 and 2011. The JIDPA has similar habitat throughout, therefore it is expected that similar species will be found throughout.



Horned lark, a commonly seen species on the JIDPA.

7.0 FENCE MONITORING AND INVENTORY

The 2 objectives of the 2011 fence monitoring were to 1) provide any locations of fence strikes on a monitored 8.2 miles of fence within a 0.6 mile sage-grouse lek buffer and provide information on the results of previously placed fence markers, and 2) inventory the uninventoried non-industrial fences (allotment, pasture, and range and habitat treatment exclosures) within the JIDPA 3-mile buffer and PAPA overlap.

In 2010, sage-grouse strike locations were identified along 8.2 miles of fence along the northeastern border of the JIDPA. Portions of this fence are within 0.6 miles of an occupied sag-grouse lek. In the spring of 2011, BLM biologists placed fence markers in the areas where sage-grouse strikes were recorded in 2010. Aster Canyon monitored this 8.2 miles of fence during the 2011 sage-grouse lekking season to record any additional strikes.

In 2010, Aster Canyon inventoried all non-industrial fences within the JIDPA and 3-mile buffer, excluding the area that overlaps the PAPA. In 2011, Aster Canyon inventoried all non-industrial fences within the PAPA and JIDPA 3-mile buffer overlap and any newly discovered fences.

7.1 Fence Methods

Fence monitoring and inventory were required and completed as per the *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 Pinedale BLM. Methods for monitoring versus inventory vary and details of each are described below.

Monitoring

Fence monitoring is required to be performed the first 2 weeks of May on any fence within 0.6 mile of an occupied sage-grouse lek. Only 1 portion (8.2 miles) of fence line within the JIDPA and 3-mile buffer is within 0.6 mile of an occupied lek. In 2010 this portion of fence was inventoried. Monitoring was performed on this 8.2 miles of fence in the northeast corner of the JIDPA once a week in April 2011 and twice in May 2011, 14 days apart between the hours of 9 am-7 pm. All fence strikes by any species were recorded during the surveys. When a strike was located it was determined whether it was a simple strike (the animal was not killed) or if it was a mortality (death or will likely die). Feathers, fur, or carcasses were removed from the fence and close vicinity so that the strike would not be recorded in subsequent surveys. This section of fence was surveyed on foot when snow and mud were present and driven when the two-track next to the fence was dry. See Map 3 for the location of the monitored fence line.

Inventory

Fences that are within the Jonah 3-mile buffer that overlaps the Pinedale Anticline Project Area were not inventoried in 2010 and therefore were inventoried 2 August 2011 through 11 August 2011. A GIS shape file of known fences was provided by the BLM to provide a baseline for fence locations. One additional fence line not located the BLM shape file was recorded in section 28, township 28 north, range 109 west. This fence is a very small dilapidated enclosure fence; it was recorded in the 3-mile buffer on 30 August 2011. Fences were surveyed from a vehicle when an existing two-track followed the fence line. If there was no existing two-track fences were surveyed on foot. Fence lines, cattle guards, gates, wildlife crossings, and any notable areas were recorded. Notable areas are considered areas that have a change in fence construction less than 50 feet long, this could also include cut or downed fence. The general line feature within the data dictionary was also used to record 2 cattle underpasses. Characteristics of fence lines were recorded such as fence height, distance between posts, strand type, and distance between strands. Measurements of these characteristics were taken in multiple areas along the fence line to determine an average.

7.2 Fence Results

Fence monitoring and inventory were performed during different times of the year and different methods were utilized for the 2 surveys, therefore, results are presented separately below. All BLM required shapfiles can be located in Appendix E.

Monitoring

The 8.2 miles of fence along the north and eastern borders of the JIDPA was monitored a total of 6 times in April and May 2011. During these monitoring surveys a total of 13 strikes were recorded, 1.6 strikes per mile. The majority (6) of these strikes were passerines and species of these birds were identified when possible and can be found in Appendix E-1. Map 3 displays all strike

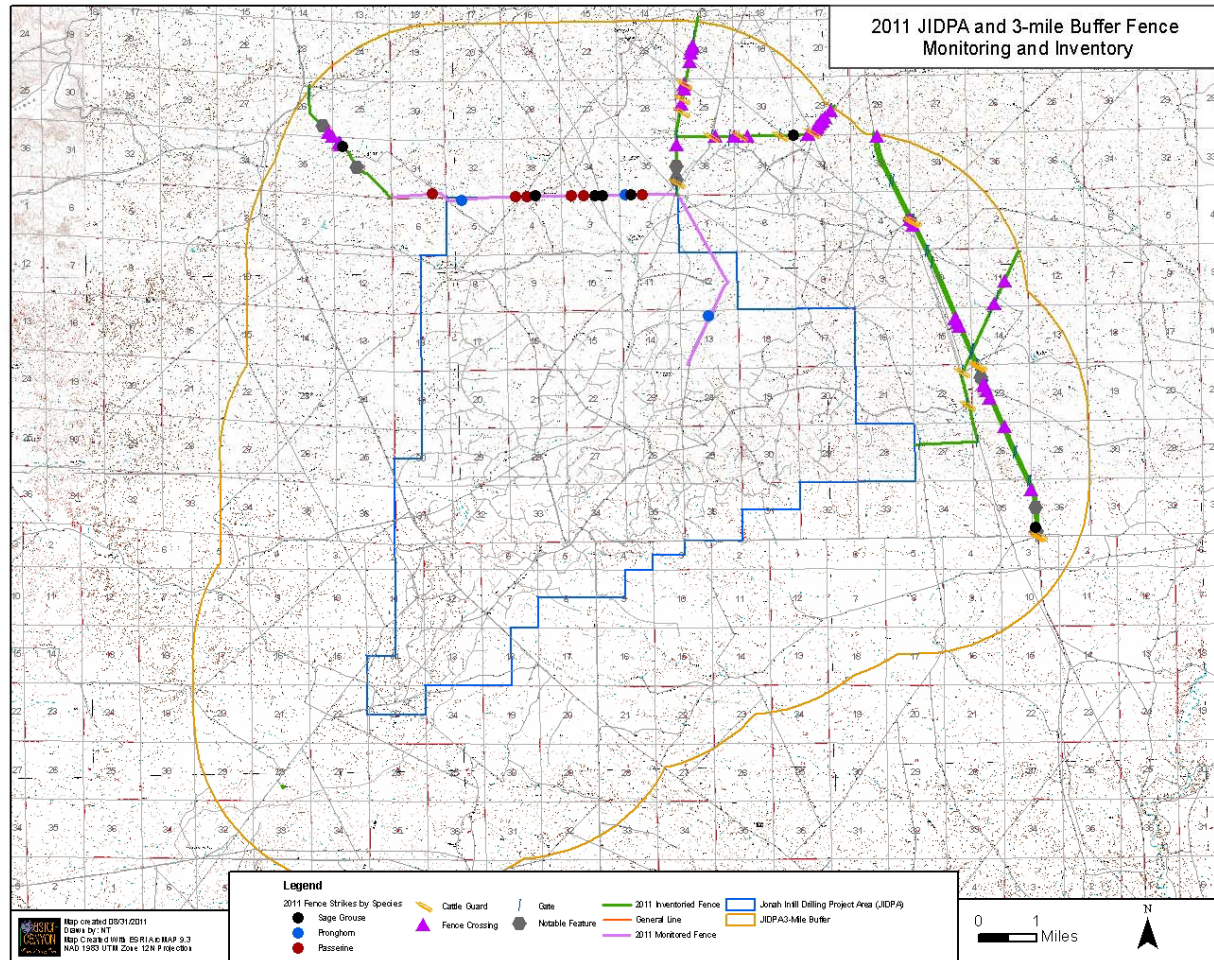


Live pronghorn entangled in a fence in the JIDPA.

locations and Appendix E provides the shapefile that details each strike. Table 7 details the species recorded and whether the strike was a simple strike or mortality strike. Aster Canyon biologists discovered 1 live pronghorn entangled in the fence. The biologists were able to release the pronghorn with a badly broken leg. This pronghorn was recorded as a mortality strike.

Table 7. Wildlife fence strikes by species located on the 8.2 miles of fence on the north eastern border of the JIDPA

Species	Simple Strikes	Mortality Strikes	Total
Sage-grouse	2	2	4
Pronghorn	1	2	3
Passerine	2	4	6
Total	5	8	13



Map 3. Locations of monitored and inventoried fence lines within the JIDPA and 3-mile buffer.

Inventory

A total of approximately 28 miles of fence were inventoried in 2011. Three sage-grouse strikes were recorded (0.1 strikes per mile) on the inventoried fence line, these strikes were recorded outside of lekking season and also outside of 0.6 mile lek buffers. Tables 8 and 9 provide details on the characteristics recorded while inventorying fences. Map 3 depicts the inventoried fences and characteristics recorded along the fences. Appendix E-2 provides all spatial data separated into 7 GIS shapefiles.

Table 8. Fence strikes recorded on the inventoried fence lines outside of the sage-grouse lekking season

Species	Simple Strikes	Mortality Strike	Total
Sage-grouse	2	1	3
Total	2	1	3

Table 9. Fence characteristics document in the JIDPA 3-mile buffer in 2011.

Total Length	Fence Crossings	Gates	Cattle Guards	Notable Areas	Fence Strikes
28 miles	41	44	16	75	3

7.3 Discussion

Fences create a barrier to movement as animals seek to meet their daily needs (Jackson Hole Wildlife Foundation 2011) Therefore, efforts should be made to decrease the impediments of fences within the JIDPA and 3-mile buffer to allow for easier travel for the species that inhabit the JIDPA and also make fences more visible to the species. The following is a discussion of Aster Canyon’s 2011 fence monitoring and inventory results and recommendations for adaptive management and protection measures.

The sage-grouse fence strikes recorded on the 8.2 miles of fence line in the northeastern border of the JIDPA were not located in the areas where sage-grouse strikes were identified in 2010. These preliminary results suggest that the fence line markers are useful in deterring sage-grouse from striking these sections of fence. Aster Canyon recommends that fence line markers be placed in the areas of the newly recorded sage-



grouse strikes and further monitoring take place in future years to provide results on the effectiveness of the fence markers.

The sage-grouse fence strikes recorded while inventorying fences were recorded in early August. It is likely that at this time sage-grouse were traveling between roosting habitat and foraging habitat. Fence markers should be placed in these areas. If these areas are being used by sage-grouse as travel corridors fence markers may deter them from colliding with the fence.

The 2 pronghorn mortality strikes were discovered on 7 April 2011. One was highly decomposed and the other was just recently entangled and still alive. Both of these pronghorn had their leg(s) stuck in the top wires of the fence. These pronghorn had attempted to jump over the fence and had gotten their legs caught. Pronghorn do have the ability to jump but often only jump when they are frightened (BLM 1989). These pronghorn were both located on the monitored 8.2 miles of fence line northeastern border of the JIDPA. The fence height at these 2 locations: were 43 and 45 inches high with 4 strands of barbed wire: and the bottom strands were 12 and 13 inches from the ground. Fences with this construction are not considered wildlife friendly for areas within pronghorn habitat.

It is recommended that unnecessary fences be removed such as the dilapidated fence in section 28, township 28 north, range 109 west (Jackson Hole Wildlife Foundation 2011). The wire on this fence is on the ground or hanging from the few remaining standing posts. This loose fence could be a hazard to running pronghorn or wild horses as wild horses have been seen inhabiting this area.

The majority of the fences on the JIDPA are 3-4 strand barbed wire fences with the bottom strand approximately 12 inches off of the ground. Deep snow in the winter can decrease the 12 inches making it even harder for pronghorn to pass under the fences. In

winter when fences are not in use or areas where the fence is never in use gates should be opened to allow wildlife to travel through.

Appendix 3 in the Record of Decision and Approved Pinedale Resource Management Plan 2008 states that existing livestock fences will be reconstructed to meet BLM wildlife friendly standards where deemed necessary and new fences will adhere to BLM Handbook H-1741-1.

The BLM Handbook H-1741-1 specifications for areas with cattle, pronghorn and deer are a smooth strand 16 inches from the ground to allow adequate space for pronghorn to pass under the fence. Three strands are preferred not exceeding a height of 38 inches. Strands should be at heights of 16 inches, 26 inches, and 38 inches.

In conclusion, sage-grouse, pronghorn and passerine strikes were recorded on fence lines within the JIDPA and 3-mile buffer. To help reduce these strikes current fences should be converted to wildlife friendly fencing with specifications mentioned above. Further details can be found in the BLM Handbook H-1741-1. Fence markers should be added in areas of recorded sage-grouse strikes and all unused fencing should be removed.

8.0 WILDLIFE OBSERVATIONS

This section includes any threatened, endangered, proposed or candidate species (TEPC); BLM Wyoming sensitive species (WSS); species listed of greatest conservation need as listed by the Wyoming Game and Fish Department (SGCN); and general wildlife observations. The observations discussed in this section were recorded as incidental sightings while surveying for other species. The presence of species observations recorded incidentally is a positive species indicator. If a species is not recorded, however, it does not mean that is not present in the JIPDA or 3-mile buffer (Sheridan and Graham 2010). These observations were recorded using the Wyoming Game and Fish Wildlife Observation System (WOS). WOS observations can be used to update species range maps, to store records of rare and sensitive species for multiple uses, and much more (Sheridan and Graham 2010).

8.1 Wildlife Observation Methods

As per the WMP, observations of TEPC, WSS, SGCN, and general wildlife, excluding common species such as pronghorn antelope (*Antilocapra americana*), and ground squirrels (*spermophilus sp.*) unless in uncommon circumstances, were recorded using the WOS. Observations were recorded from 16 August 2010 to 15 August 2011. Species documented during specific species surveys were not included in the WOS. For example, nesting raptors observed while performing raptor monitoring were not recorded in the WOS.

8.2 Wildlife Observation Results

A total of 19 different species (17 birds, 2 mammals) were recorded and 87 individuals were recorded (Table 10 and Map 4). Species of note include the great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis macularius*), and greater sage-grouse. The WOS spreadsheet for the JIDPA and 3-mile buffer can be found in Appendix F.

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Table 10. List of all incidental wildlife observations on the JIDPA and 3-mile buffer in 2011

Species	Number of Observations	Number of Individuals Observed
Birds		
American kestrel	2	2
Common nighthawk	1	1
Dark-eyed junco	1	2
Ferruginous hawk ^{1,3}	4	4
Golden eagle ⁴	3	3
Great blue heron	1	1
Greater sage-grouse ^{1,2,3}	4	8
Lark sparrow	1	1
Loggerhead shrike ¹	2	2
Northern harrier	2	3
Prairie falcon ¹	1	1
Red-tailed hawk	1	1
Rough-legged hawk	1	1
Sage sparrow ^{1,3}	2	4
Spotted sandpiper	1	1
Vesper sparrow	1	1
White-crowned sparrow	1	1
Mammals		
Coyote	3	4
Wild horse	6	46*

1 = BLM Sensitive Species

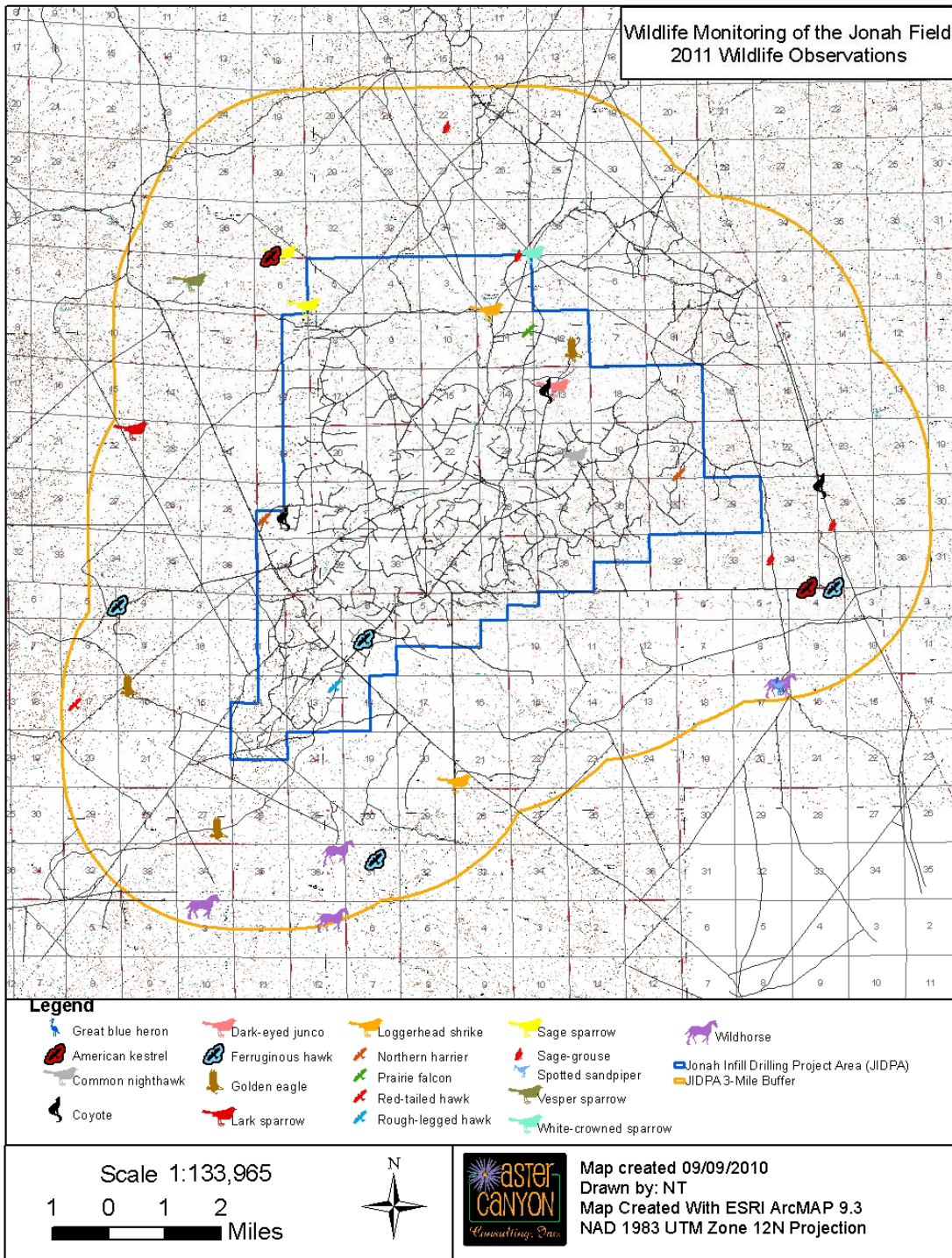
3 =Species of greatest conservation need

2 = TEPC

4 = Bald eagle and Golden eagle Protection Act

* Individual horse may have been counted twice on multiple sightings





Map 4. Spatial distribution of wildlife observations in the JIDPA and 3-mile buffer in 2011.

Birds

The sightings of two shorebirds, the great blue heron, and the spotted sandpiper, both took place at an earthen dam reservoir that often remains full of water throughout the summer. Multiple raptor species were recorded and these species can often be observed hunting in the JIDPA and 3-mile buffer.

Mammals

Coyotes and wild horses were observed this year. The wild horses (*Equus ferus*) were observed only in the 3-mile buffer while the coyote was seen in the JIDPA and 3-mile buffer. American badgers (*Taxidea taxus*); white-tailed prairie dogs (*Cynomys leucurus*), pronghorn antelope, and ground squirrels are commonly observed in the JIDPA and 3-mile buffer and therefore were not recorded in the WOS.

Amphibians and reptiles

No amphibians or reptiles were recorded in the JIDPA or 3-mile buffer in 2011. However, there were unrecorded sightings of the greater short-horned lizard (*Phrynosoma hernandesi*).

8.3 Wildlife Observation Discussion

Many species utilize the sagebrush-steppe habitat of the JIDPA study area for breeding, migratory stopovers, and over wintering. Some of these species are of special concern and may become of higher regulatory concern in the future. General wildlife sightings presented here are most likely biased towards those species easily detectable from roads. Recorded wildlife sightings often coincide with the number of crews in the field in a particular year, and this year the number of crews was lower than previous years.

Mitigation measures that will benefit all wildlife on the JIDPA include the following actions. Avoiding the disturbance of all identified critical habitat (e.g. draws, rocky outcrops). The protection of all water sources is especially important in this semi-arid ecosystem. Restoration of habitat to preconstruction state could be facilitated by the

transplanting of shrubs to address the slow growth rate of sagebrush. Application of spatial buffers and seasonal no-construction constraints around nests, breeding areas and critical winter habitat is also recommended. Education and increased awareness of gas field workers regarding the presence of sensitive species and how to work safely around wildlife should be a part of every proactive management plan.

The JIDPA is home to a diversity of wildlife, and as such, mitigation measures that may benefit one species may be detrimental to another (e.g. installation of raptor platforms may have a negative effect on nearby songbird and pygmy rabbit populations). It is important to take into consideration the indirect effects of applying management practices, thus minimizing any adverse effects on other species.



Greater short-horned lizard often observed in the JIPDA and 3-mile buffer.

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
WPP = Wildlife Monitoring Plan
WOS = Wyoming Observation System
WSS = Bureau of Land Management Wyoming Sensitive Species

COMMON AND SCIENTIFIC NAMES OF SPECIES PRESENTED IN THIS REPORT

COMMON NAME

SCIENTIFIC NAME

Birds

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>
Dark-eyed junco	<i>Junco hyemalis</i>
Ferruginous hawk	<i>Buteo regalis</i>
Golden eagle	<i>Aquila chrysaetos</i>
Great blue heron	<i>Ardea herodias</i>
Greater sage-grouse	<i>Centrocercus urophasianus</i>
Horned lark	<i>Eremophila alpestris</i>
Lark sparrow	<i>Chondestes grammacus</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Mountain plover	<i>Charadrius montanus</i>
Northern harrier	<i>Circus cyaneus</i>
Prairie falcon	<i>Falco mexicanus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Sage sparrow	<i>Amphispiza belli</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
Short-eared owl	<i>Asio flammeus</i>
Spotted sandpiper	<i>Actitis macularius</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>

Mammals

American badger	<i>Taxidea taxus</i>
Black-footed ferret	<i>Mustela nigripes</i>
Coyote	<i>Canis latrans</i>
Pronghorn	<i>Antilocapra americana</i>
Pygmy rabbit	<i>Brachylagus idahoensis</i>
White-tailed prairie dog	<i>Cynomys leucurus</i>
Wild horse	<i>Equus ferus</i>

Plants

Rabbitbrush	<i>Chrysothamnus</i> sp.
Sagebrush	<i>Artemisia</i> sp.
Saltbrush	<i>Atriplex</i> sp.
Wyoming big sagebrush	<i>Artemisia tridentata</i> var. <i>wyomingensis</i>



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