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2010 JONAH FIELD WILDLIFE INVENTORY AND MONITORING

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

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1.0 EXECUTIVE SUMMARY

Aster Canyon Consulting, Inc. (Aster Canyon) has prepared this 2010 Jonah Field Wildlife Inventory and Monitoring Report in compliance with criteria set forth by the Bureau of Land Management (BLM) and the Jonah Interagency Mitigation Office (JIO) as described in the Wildlife Monitoring Protection Plan (WMPP; (BLM and JIO 2007)). The purpose of these inventories are as follows: to present findings which result from the monitoring of wildlife in the Jonah Infill Drilling Project Area (JIDPA) and its 3-mile buffer, to compare trends of observations and data collected over time when possible, to identify existing mitigation and protection measures as described in the BLM Jonah Field Record of Decision (ROD; (BLM 2006)), and to make recommendations for new measures and monitoring efforts.

Data presented in this report was collected between 16 August 2009 and 15 August 2010. Existing criteria discussed in the WMPP are for: threatened, endangered, proposed, and candidate species (TEPC); species of greatest conservation need (SGCN); and BLM Wyoming Sensitive Species (WSS). Species from these listings, which were independently inventoried in 2010, include: raptors, mountain plovers (*Charadrius montanus*), landbirds, pygmy rabbits (*Brachylagus idahoensis*), and white-tailed prairie dogs (*Cynomys leucurus*). Species that were not independently inventoried for 2010, but are discussed in this Monitoring Report and the WMPP include: species of special status, greater sage-grouse (*Centrocercus urophasianus*), and big game species. Additionally, a fence inventory was initiated this year and conducted within the JIDPA and 3-mile buffer.

Other species not specifically referred to in the WMPP but who are on the TEPC, WSS, or SGCN lists are addressed in this document under general wildlife. This report is presented by species, and provides an introduction, methods, results, and discussion of

current and recommended protection measures for each. A summary of inventory results is given below.

RAPTOR

- A total of 118 raptor nests were monitored during the 2010 breeding season.
- Ten new burrowing owl nests were recorded.
- Seven burrowing owl nests successfully hatched and fledged young.
- The 2 ferruginous hawk artificial nesting structures on the JIDPA were both active and successfully fledged young.
- Monitoring of common raven nests was not required by the BLM in 2010.

MOUNTAIN PLOVER

- A total of 11 mountain plovers were observed during the 2010 nesting season.
- All mountain plover sightings were made within previously occupied habitats.

LANDBIRDS

- 34 point counts were conducted on the JIDPA in 2010.
- 257 individual birds, consisting of 10 species of landbirds, were detected on the JIDPA in 2010

PYGMY RABBIT

- 78 plots were surveyed in the 56 sections of the JIDPA in 2010.
- 14 observations of pygmy sign were recorded on 9 survey plots.
- 90% of all sightings occurred in patches of tall, dense sage.

WHITE-TAILED PRAIRIE DOG

- 26 active prairie dog towns were documented in the JIDPA and 3-mile buffer in 2010.
- 9 new prairie dog towns were documented in the JIDPA and 3-mile buffer in 2010.
- 2700 total acres of active prairie dog towns were mapped.

FENCE INVENTORY

- 52 miles of fence were surveyed
- 7 fence strikes and 1 mortality were documented.

GENERAL WILDLIFE

- Twenty-one different species (14 avian and 7 mammalian) were detected in the JIDPA and 3-mile buffer in 2010.
- Species of note include: moose, loggerhead shrike, short-eared owl, northern pintail, and greater sage-grouse.
- The JIDPA is used by a diversity of breeding, migratory, wintering, and transient species. Thus, management recommendations for general wildlife are broad.

GREATER SAGE-GROUSE

- No monitoring for sage-grouse was required in 2010 on the JIDPA.
- In 2010, there was a total of 97 sage-grouse sign observations made, along with 16 individual sage-grouse on the JIDPA.

BIG GAME

- No monitoring for big game was required in 2010 on the JIDPA.
- A moose was seen incidentally on the JIDPA in 2010.

The principle protection measure underway on the JIDPA for most wildlife species is the avoidance of sensitive/critical habitats during certain times each year, specifically, raptor and burrowing owl nest sites, mountain plover breeding grounds, big game winter concentration areas, and sage-grouse leks.

Area within the JIPDA, displaying the shrub-steppe habitat seen throughout the study area.

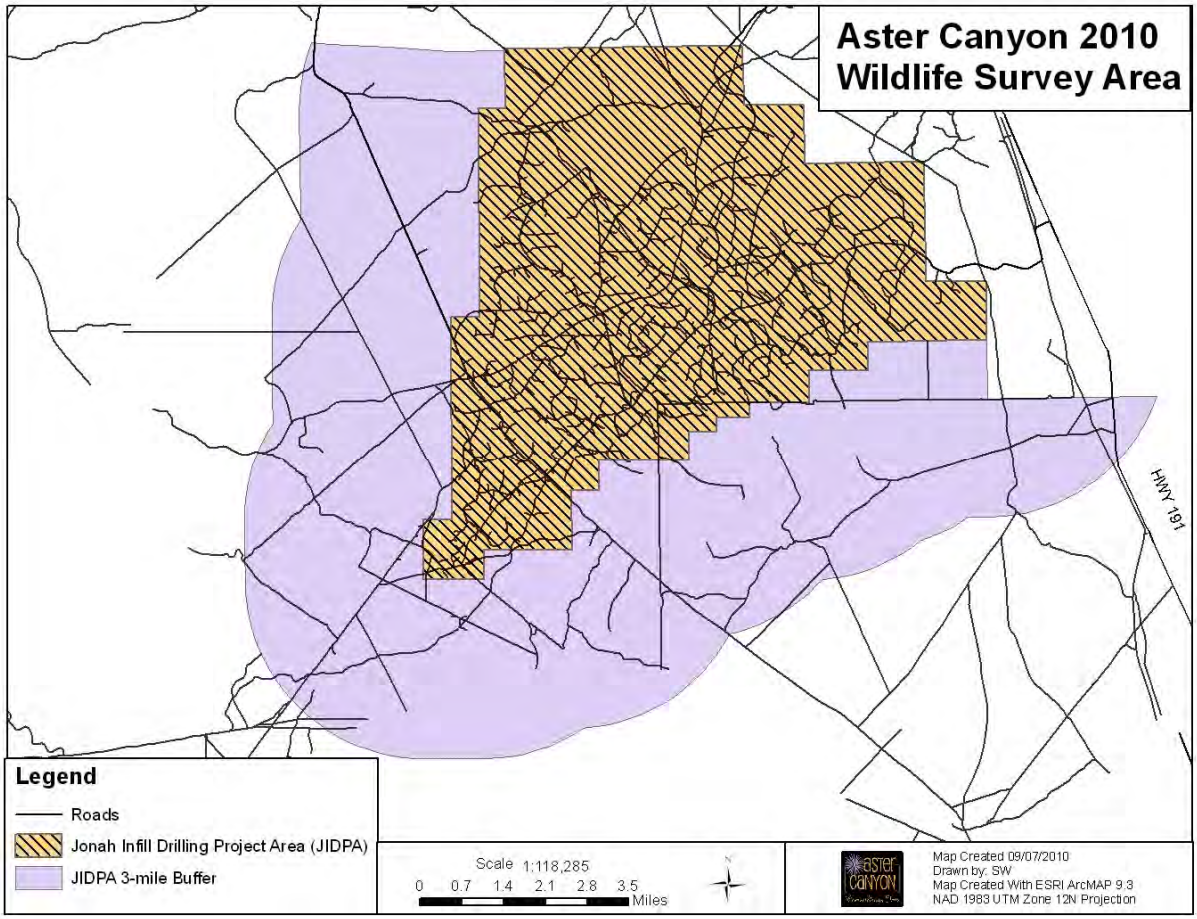
2.0 INTRODUCTION

The JIDPA is located in the Upper Green River Basin, south of Pinedale, within Sublette County, Wyoming. The JIDPA is 94% federally owned. The area has one of the richest concentrations of natural gas in the United States (JIO 2009). The sagebrush dominated ecosystems located in the area are critically important to many of Wyoming's wildlife species. Many 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 recommended under the Environmental Impact Statement (EIS), written in compliance with the National Environmental Policy Act of 1969 (NEPA). These studies were instituted in 1996 with Anderson Environmental Consultants, Inc. TRC Mariah Associates, Inc. (TRC) conducted the inventories from 1997 through 2005, and Aster Canyon inventoried during 2007, 2008, and 2009. Funding was not allocated for the project for 2006, thus no data was collected for that year.

Study Area

Aster Canyon's 2010 Jonah Field Wildlife Inventory and Monitoring study area includes the JIDPA and a surrounding 3-mile buffer (Map 1). The 3-mile buffer was eliminated on the north and east sides of the JIDPA in 2009 and 2010 due to overlapping study areas with the Pinedale Anticline. Raptors, mountain plover, white-tailed prairie dog, fence inventory and general wildlife monitoring were conducted in the JIDPA and 3-mile buffer. Pygmy rabbit and landbird monitoring was completed only within the JIDPA. The JIDPA encompasses approximately 30,500 acres of townships 28N and 29N, ranges 107W through 109W, and is located approximately 32 miles southeast of Pinedale and 28 miles northwest of Farson in Sublette County, Wyoming (BLM 2006). 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* spp.), rabbitbrush (*Chrysothamnus* spp.), saltbush (*Atriplex* spp.), 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. It is intersected by numerous ephemeral washes and playas but lacks any permanent water bodies, although in 2010 in section 17, township 29N, range 107W a spring kept a small reservoir full of water. Total precipitation averages 8.0 inches per year, and elevation ranges from 7,000 - 7,400 feet (BLM 2006).



Map 1. 2010 Study Area, the JIDPA and 3-mile buffer

2.1 Purpose and Objectives

The purpose of the 2010 Jonah Wildlife Inventory was to identify wildlife and wildlife resources in the JIDPA and 3-mile buffer; to assist land managers and operators in planning efforts; and assist in efforts to maintain desired wildlife population levels on the JIPDA. Wildlife trend data is presented in this report when available. Aster Canyon's monitoring of the study area was done in an effort to provide data that will assist in determining disturbance effects on wildlife resources within the JIDPA and its 3-mile buffer. This information will 1) assist land managers in determining appropriate mitigation and protection measures; 2) provide suggestions for continued monitoring; and 3) provide the data necessary to validate and revise EIS wildlife models and projections. All required BLM spreadsheets and spreadsheets to assist operators can be found within the appendices on the attached disk.

2.2 Datum and General Information

Specific survey methods and techniques employed during this effort follow those presented in the WMPP. Revisions to these methods were discussed and made in accordance with the BLM Pinedale Field Office (PFO) and JIO's recommendations. 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 survey efforts include: Garmin Rino110, Garmin eTrex Legend, Garmin eTrex Legend HCx, 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 Species of Greatest Conservation Need

There are several species on the TEPC species list generated by the U.S. Fish and Wildlife Service, the BLM WSS list, and the SGCN list by the Wyoming Game and Fish Department (WGFD) that occur within the JIPDA. The species discussed in the WMPP include the following (BLM and JIO 2007): the black-footed ferret [*Mustela nigripes* (surveys were not required in 2010)], ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), western burrowing owl (*Athene cunicularia*), mountain plover (*Charadrius montanus*), landbirds, white-tailed prairie dogs (*Cynomys leucurus*), pygmy rabbit (*Brachylagus idahoensis*), and greater sage-grouse [*Centrocercus urophasianus* (surveys were not required in 2010)]. Efforts to inventory species that occur on the list, but are not known to occur within the study area, were limited to general wildlife observations. A fence inventory was initiated in 2010 to record all fences that occur on the JIDPA and 3-mile buffer and document wildlife strikes and areas of concern.

2.4 Overall Monitoring and Protection Measures

American badger seen along a pipeline corridor on the JIDPA

Each species presented in this report has monitoring and protection measures specific to their needs. These protection measures, along with additional recommendations, are presented independently in each species' section. However, some measures apply to all wildlife on the JIDPA and its 3-mile buffer. Table 1 presents the wildlife protection measures for all

surface disturbance activities in the JIDPA. A recurring theme 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 preserving 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 varied structures and ages, provides more opportunities for wildlife use and should be maintained. It has also been determined 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 and is tasked with managing $24.5 million funded by EnCana Oil and Gas (USA) Inc and BP American Production Company. 16.5 Million dollars are committed to off-site wildlife mitigation. As of December 2008, JIO has allocated $13,474,530 of the $16,500,000, with the majority of funds going toward purchases of conservation easements. The remaining $3,025,469 is designated for additional wildlife mitigation projects. JIO plans to use the remaining funds to enhance areas under conservation easements and design a monitoring plan to validate the effectiveness of implemented projects. The JIO plan does not exclude additional proposals for the use of these funds (JIO 2009).

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 0.5-mile 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 30	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	Nesting season	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/jio/project_aps.htm). The JIO was created to provide overall management of field monitoring and mitigation activities, both on and off-site (JIO 2010). The JIO and BLM jointly authored the WMPP for the 2010 inventory and monitoring project.

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 2010).

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 2010).

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

As predators, raptors help keep prey populations in balance. Even more significant is their role as environmental indicators. Raptors are excellent indicators of environmental change because of their large home ranges; they are top predators; are sensitivity to chemical contamination, and other anthropogenic disturbances (SOAR 2010).

Raptors found nesting within the JIDPA include ferruginous hawks (*Buteo regalis*), American kestrels (*Falco sparverius*), and western burrowing owls (*Athene cunicularia*). These raptors are all protected under the Migratory Bird Treaty Act of 1918 (MBTA), and the ferruginous hawk and western burrowing owl are also considered WSS. Sightings of raptors utilizing the JIDPA and 3-mile buffer for activities other than nesting can be found in the General Wildlife section and include; prairie falcon (*Falco mexicanus)*, short-eared owl (*Asio flammeus*), golden eagle (*Aquila chrysaetos*), and red-tailed hawk (*Buteo jamaicensis*).

Golden eagles are often seen perched within the JIDPA and 3-mile buffer.

Aster Canyon biologist, Nicole Thiele, monitored raptors within the JIPDA and 3-mile buffer from 19 April to 2 August 2010. The objective of the 2010 raptor monitoring effort was to quality control the BLM official raptor nest database, monitor previously recorded raptor nests to determine activity and nesting success, and to search for new raptor nests. Activity and nesting success is used to evaluate trends when possible. This

monitoring effort will help operators remain in compliance with the MBTA, assist with planning efforts, and monitoring raptors provides real-time data to give nesting raptors protection buffers. The results from individual monitoring surveys throughout the breeding season were distributed as real time data to the BLM and JIDPA operators. The results presented in this section are a summary of the entire nesting season and not individual monthly real-time data.

3.1 Raptor Methods

The following section describes the methods used during the 2010 raptor monitoring of the JIDPA and 3-mile buffer. The Raptor Survey Protocol (Appendix A-1) and Burrowing Owl Survey Protocol (Appendix A-2) within the *Wildlife Survey Protocols, Pinedale Field Office version 2.2 May 2010* were followed. In 2010, the BLM provided Aster Canyon a list of historic nest locations to be monitored; adding 64 nests to the 118 nests that were monitored in 2009. Common raven (*Corvus corax*) nests were not required by the BLM to be monitored in 2010. A total of 32 field days were spent monitoring existing nests.

As a quality control check of the official BLM raptor nest database, after nests were deemed inactive, nest locations were approached on foot to determine nest condition. Nests were considered inactive after no raptors were observed in the area. Nest locations were approached to provide evidence that some UTM locations in the database were not actual nests, due to duplications in the database or incorrect UTMs. Some nests no longer exist, they are gone or historic (see definitions in Appendix A-1). If nest locations were determined to be either gone or were likely never a nest they were flagged, recommended for delisting and removed from further monitoring efforts. These nests are highlighted in yellow in the BLM summarized activity data spreadsheet, and the BLM activity spreadsheet (Appendix A-4 and A-7). Once a nest was considered gone or historic the nest was not returned to for further observations. In all cases, nest condition was classified as one of the following: gone, remnants, poor, fair, good, or excellent.

- Gone - There may or may not be evidence of where the nest was, but it is no longer there.
- Remnants - Scant material remaining and not usable unless fully rebuilt.
- Poor - Nest is dilapidated, in need of major repair to be used.
- Fair - Nest is not dilapidated, but needs significant repair in order to be used. Material is slumping or sliding.
- Good - Nest is in need of only minor attention in order for it to be used. Nest has apparently been maintained within the past year.
- Excellent - Nest is able to be used with little or no attention or maintenance needed. Bowl intact and nest is in usable condition. Recently maintained or repaired.

All previously recorded burrowing owl nests were checked a minimum of 3 times, with approximately 1 month between visits. All other raptor nests were visited at least 2 times with approximately 1 month between visits. Several nests were checked more than protocol dictated, depending on activity. Surveys were not performed in adverse weather conditions and all surveys were conducted with precautions to ensure nesting raptors were not disturbed.

Hatch and fledge status was determined where possible; these terms are new for Jonah Protocols in 2010. In the past nest productivity was classified as failed or successful. In 2010, successful hatch status was defined as a pair producing at least one hatchling. A failed hatch status was defined as a pair not producing at least one hatchling. Aster Canyon defined fledging as when the young is fully feathered and leaves the nest voluntarily (Steenhof and Newton 2007). A successful fledge status was defined as a pair producing at least one fledgling. A failed fledge status was a pair not producing at least one fledgling.

The BLM summarized activity data spreadsheet (Appendix A-7) summarizes nest activity and occupancy for the entire 2010 nesting season. Please see the Raptor Survey Protocol (Appendix A-1) for definitions of occupancy and activity. The BLM activity spreadsheet is a compilation of all nesting surveys performed during the 2010 nesting season (Appendix A-4). It should be noted that as required by BLM protocol, if a nest was ever considered occupied, its status will remain occupied for the year. Also within Appendix A, a spreadsheet has been prepared to assist operators with planning efforts (Appendix A-5 & A-8).

It should be noted, if no evidence of a nest was found at a pre-recorded location and it was unknown if a nest ever existed at this location, a classification of Inactive was given rather than Historic.

Along with monitoring pre-recorded nests the 2010 raptor monitoring effort included searches for new nests in suitable habitat. New nest searches were performed by all field crews while conducting surveys on the Jonah and 3-mile buffer. Burrowing owl call playbacks were utilized within prairie dog towns in an attempt to detect new burrowing owl nests. Appendix A-6 is the required BLM Location spreadsheet that displays all new nests found during the 2010 nesting season.

Burrowing owl fledgling observed on the JIPDA.

3.2 Raptor Results

Presented here are the results from quality controlling the BLM database, monitoring recorded nests, and searching for new nests. Also within this section is a figure displaying the trend of active burrowing owl nests in relation to the amount of hours spent searching. A total of 182 pre-recorded nest locations were provided by the BLM for observation. After observing these 182 locations, Aster Canyon suggested 74 nests be delisted from the BLM official raptor nest database and these nest were removed form monitoring efforts. After the removal of the 74 delisted nests, 108 previously recorded nests remained to be monitored for the 2010 nesting season. A total of 10 new burrowing owl nests were detected in 2010 bringing the total nests monitored to 118 (Map 2).

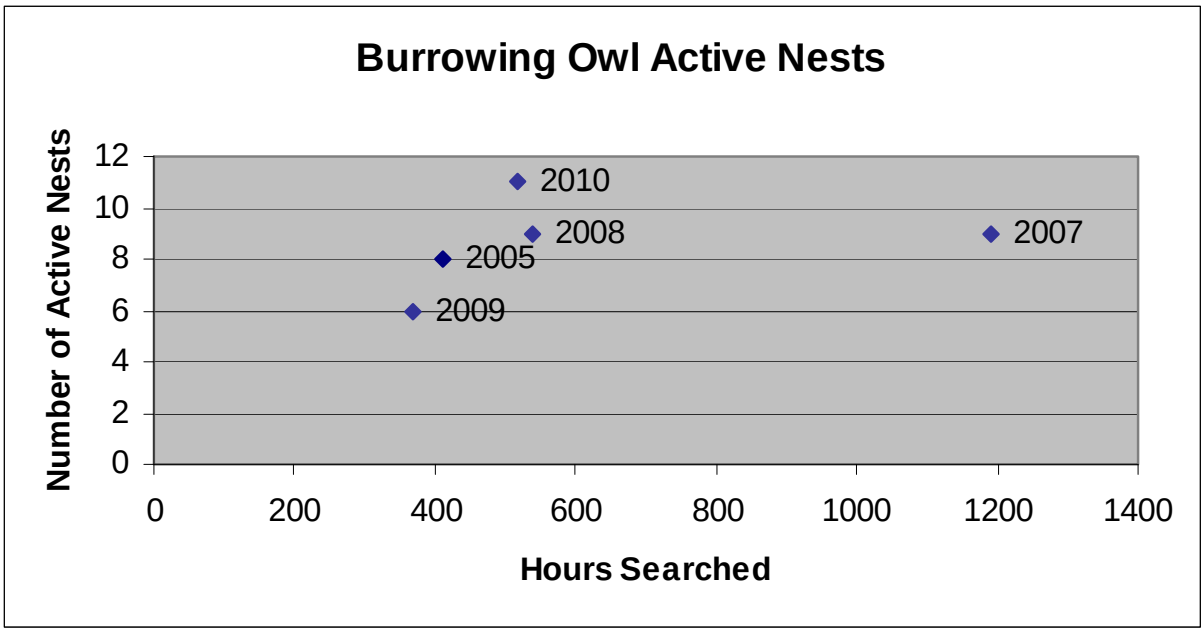
Table 2. Summary of the 2010 raptor monitoring season on the JIDPA.

Species Monitored in 2010	Total Number Nests	Number Occupied	Number Active	Number Hatch Successful	Number Fledge Successful
American Kestrel	22	4	2	0	0
Ferruginous Hawk	43	2	2	2	2
Western Burrowing Owl	51	12	11	7	7
Unknown Raptor	2	0	0	0	0
Total	**118**	**17**	**14**	**9**	**8**

These numbers do not include nests recommended for delisting; they do include newly recorded nests.

Figure 1 below displays the number of active burrowing owl nests found against the time spent searching for nests over the past 5 years excluding 2006 when no surveys were conducted. Hours searched includes time spent on raptor monitoring along with time spent mapping prairie dog towns. The hours from 2005 also include hours spent on mountain plover surveys as stated in the TRC 2005 report (TRC Mariah 2006).

Figure 1. Trend of active burrowing owl nests found in relation to search effort. Effort data was taken from Aster Canyon past reports and from the TRC 2005 report. Only nests within the 2010 study area were included in this figure.



3.3 Raptor Discussion

Presented in this section is a discussion of new nest searches, monitoring results by species, trends found by species, and existing and suggested protection measures.

New nests search resulted in the discovery of 10 new burrowing owl nests. No new nests of any other species were located. Search effort for burrowing owls significantly increased in 2010 with the increases survey efforts and incidental sightings of burrowing owls reported. Three (3) burrowing owl nests were found while mapping prairie dogs. Three nests were found while conducting monitoring for other species and 2 were located by non-biologist working on the JIDPA. Call broadcasts were utilized in prairie dog towns near previously recorded nests, this technique did not produce any new burrowing owl sightings but known owls did respond. Trends indicate (Figure 1) that as search effort increases the number of nests found also increases.

Figure 2 displays the results of the 2010 raptor monitoring divided by species. The following is a discussion of that figure. Two American kestrel nests were considered active as a result of courtship activities being seen near the cavities. Because of their proximity to one another, only one of these two cavities would have been chosen for a nest site by the American kestrels. After multiple observations neither of the 2 active nests remained active after the initial observation. American kestrels utilize rock cavities within the JIDPA and their nests can be difficult to locate. After searching the rocky areas within the JIDPA and 3-mile buffer no cavities were located that displayed heavy whitewash consistent with an active cavity nest; however, kestrels were seen in the rocky areas but never observed defending a nest.

For the third consecutive year both ferruginous hawk artificial nesting structures, 291073301 (NFH126) and 291073202 (NFH128) have been the only occupied and active ferruginous hawk nests within the JIDPA and 3-mile buffer. Both nests have successfully fledged young each of the past 3 years.

Twelve burrowing owl nests within the JIDPA and 3-mile buffer were determined to be occupied. One nests' occupants did not exhibit a breeding attempt, therefore this nests was never considered active. Juveniles were never seen at 4 of the 7active nests, 2 of these nests were abandoned early and likely never produced eggs. One nest most likely fledged young based on the sign seen but they were never observed. Only one adult was ever seen at the remaining nest, it is unknown whether eggs were ever produced at this location. Please see Appendix A-4 for details on individual surveys.

Population trend data provides managers information about changes in populations over time. These trends assist in the understanding of the impact of activities in areas such as the JIDPA. However, raptor population trends within the JIDPA and 3-mile buffer were not analyzed due to multiple changes in the study area, change of contractors and multiple changes in BLM protocols. These factors compromise reliability and negate any trend observed in these data. Once the study area and techniques are consistent, trend data will be more reliable and provide a valuable tool for management of the JIDPA.

Ferruginous hawk platform located in the JIPDA 3-mile buffer.

Protection measures are in place for raptors within the JIDPA under the 2006 JIDPA ROD. Protection measures outlined within the ROD state that well pads, access roads, and other facilities are not to be located within 1,000-feet of active ferruginous hawk nests or within 825-feet of all other active raptor nests (BLM 2006). Seasonal restrictions apply (1 February – 31 July) for surface disturbance activities within 1-mile of active ferruginous hawk nests and 0.5-mile of all other active raptor nests (BLM 2006).

Additional implemented protection measures include facilities and construction sites designed to avoid disturbance to known active nest sites (BLM 2006). Raptor nest surveys are to be conducted within a 1-mile radius of proposed surface activities between 1 February and 31 July, and the previously mentioned protection measures and seasonal restrictions discussed are to be applied. Finally, the JIDPA Operators are to notify officials immediately when a raptor nest site is discovered on a project facility in order to coordinate relocation of the nest in conjunction with construction of an artificial nest structure (BLM 2006).

In addition to the above mentioned required protection measures EnCana has taken the initiative to place netting around open pits to prevent birds from entering these pits. An additional measure is to place signs along roadways in the vicinity of active nests, warning drivers to be extra cautious. To increase the number of active ferruginous hawk nests and mitigate for the nesting habitat lost due to construction and disturbance within addition artificial nesting structures should be erected. This process requires cooperation with the USFWS and careful consideration of platform placement.

In conclusion, 118 nests were monitored within the JIDPA and 3-mile buffer with 17 of these nests being occupied. Conclusive population trends can not be analyzed at this time due to change in study area and protocols over the years. However, based on Aster Canyon's experience and knowledge it is predicted that populations of ferruginous hawk, American kestrels, and burrowing owl nesting within the JIDPA will remain stable with continual protection of the rock outcroppings, artificial nesting platforms, and increased searched effort for nesting burrowing owls.

4.0 MOUNTAIN PLOVER

The mountain plover is a small terrestrial shorebird that occupies dry, open, shortgrass prairies, agricultural fields, and shrubland habitats of the western Great Plains. It is 1 of 12 birds endemic to North American Grasslands that has declined over the past century (Dreitz et al. 2006). In Wyoming the mountain plover can be seen during migration and during their breeding season, and are found in both short and sparsely vegetated grasslands and shrub-steppe habitats (Smith and Keinath 2004).

The mountain plover was proposed for listing under the ESA in 2002, this proposal was withdrawn in 2003 after the threats to the mountain plover were deemed "overestimated". The USFWS is now reinstating the portion of the 2002 proposal concerning listing the mountain plover as threatened. A final listing decision is due no later than 1 May 2011 (USFWS 2010c).

Mountain Plover observed in the JIDPA 3-mile buffer

Aster Canyon biologist Nicole Thiele monitored previously identified mountain plover breeding habitats within the JIDPA and 3-mile buffer from 1 May to 15 June 2010. The objective of the 2010 mountain plover monitoring was to determine habitat occupancy and to evaluate trends of mountain plover sightings.

The results from individual monitoring surveys throughout the breeding season were distributed as real time data to the BLM and JIDPA operators. The results presented in this section are a summary of the entire nesting season and not individual monthly real-time data.

4.1 Mountain Plover Methods

Methods used for mountain plover monitoring coincided with previous monitoring efforts from 2002-2009. During the 2010 monitoring efforts the Mountain Plover Survey Protocol (Appendix B-2) (adapted from the Mountain Plover Survey Guidelines USFWS March 2002) within the *Wildlife Survey Protocols, Pinedale Field Office version 2.2 May 2010* was utilized. The large scale/long term project protocol within the Mountain Plover Survey Protocol was used for 2010 monitoring. A total of 13 survey days were logged and consisted of the following techniques:

- Surveys were conducted between sunrise and 10:00 a.m. to facilitate spotting the white breast of the plovers.
- Surveys were only conducted during favorable weather conditions.
- Surveys were conducted by truck on main roads and two-tracks through mountain plover habitat.
- Binoculars were used to scan the area for plovers. If needed, a spotting scope was used to confirm sightings.
- Vehicles frequently stopped and were turned off with windows down, allowing for audible detection of plovers.
- Suitable habitat was surveyed 3 times, with at least 14 days between surveys.
- Areas were searched for nests and eggs if it was deemed non-intrusive.
- Locations of observed plovers were recorded using a GPS.

Locations of plovers sighted were recorded on the mountain plover survey forms (Appendix B-1). Locations were also recorded on the BLM Mountain Plover Spreadsheet (Appendix B-4). UTM locations were added to the BLM spreadsheet for operators to assist in their planning (Appendix B-3). A shapefile of the mountain plover habitats can also be found in the Appendix B-7.

One mountain plover habitat boundaries were re-delineated in 2010. Delineation efforts included a biologist walking the boundary of the habitat where short sparse vegetation changed to thicker taller vegetation. The biologist's route was recorded on a GPS then mapped using GIS.

4.2 Mountain Plover Results

Presented in this section are the results of the 2010 mountain plover monitoring effort. Results depicted in Table 3 below, illustrate that 8 mountain plover sightings were documented during the 2010 monitoring effort with a total of 11 individuals. Mountain plovers were observed at Habitats 1, 26, 29, and 30 in 2010 (Map 3).

Mountain plover observations were made during multiple surveys thus; the plovers observed may have been counted multiple times. An additional adult with 2 chicks was seen in Habitat 29 on 5 July 2010. These 3 mountain plovers are not included in the monitoring totals or the maps and tables because it was not observed during mountain plover monitoring. However they can be found in the General Wildlife Section.

An evaluation was made of past observations from 1999-2010 to determine which habitats within the JIDPA and 3-mile buffer have ever been occupied. There are a total of 27 habitats that are monitoried for occupancy. Table 4 illustrates the 9 mountain plover habitas that have been occupied in the 11 years.

Table 3. Number of mountain plover sightings by date and site during the 2010 monitoring efforts.

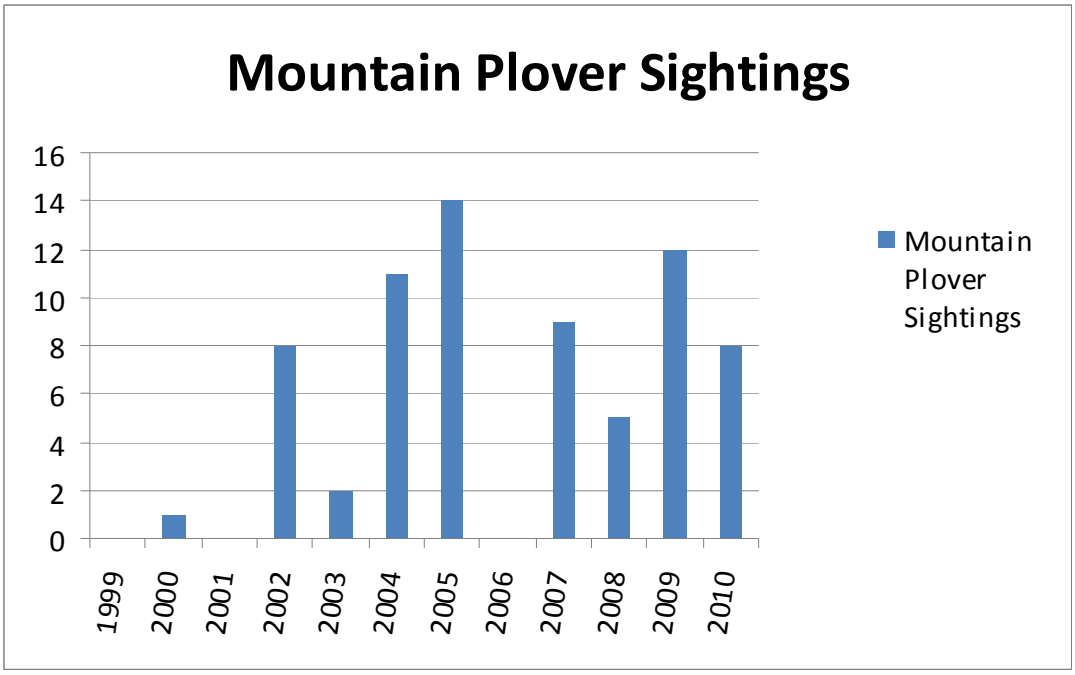
Habitat #	Date	Survey #	Number of Birds
1	6/8/2010	3	1
1	5/19/2010	2	1
26	5/6/2010	1	2
26	5/25/2010	2	1
26	6/15/2010	3	1
29	5/19/2010	2	3
29	6/8/2010	3	1
30	6/3/2010	3	1
Total			**11**

Table 4. All occupied habitats from 1999-2010 and the year mountain plovers sightings were made.

Habitat #	Year of Mountain Plover Sightings
1	2004,2007,2008,2009, 2010
6	2005, 2008
10	2007
18	2007
26	2002,2003,2004,2005,2007,2009,2010
27	2005, 2008, 2009
28	2004
29	2004,2007,2008,2009, 2010
30	2000,2002,2008, 2009, 2010

Results depicted in Figure 2 provide insight on the trend of sightings (not the number of plovers) made from 1999-2010, within the current study area. A "sighting" is defined as the number of times mountain plovers were observed during the monitoring period, multiple plovers may have been counted during each sighting. During 1999 and 2001 there were no known observations made within the present study area. Monitoring was not performed in 2006.

Figure 2. Mountain plover sightings from 1999 to 2010 (data was not collected in 2006) within the current study area. This is not the number of individual plovers observed.



Mountain plover Habitat 1 was re-delineated in 2010; this re-delineation was completed to include surrounding habitat that was not previously included. Habitat 1 was originally 153 acres and it is now 356 acres.

4.3 Mountain Plover Discussion

The following section discusses the results presented above, discusses mountain plover habitat results and protection of habitat.

In 2010 there were 8 mountain plover sightings. This is slightly above the average of 6 mountain plover sightings per year. This average was determined by the results of Figure 2. The results from Figure 2 were analyzed using data from TRC for 1999-2005 (TRC 2006). Aster Canyon's data was used for 2007-2010. Data was not collected in 2006. Trends can only be analyzed by using the number of mountain plover sightings, not the abundance or population size of mountain plovers. Mountain plover habitats have been surveyed at least 3 times per monitoring season from 2007-2010. It is unknown how many times mountain plover habitats were surveyed each monitoring season during 1999-2005. Individual plovers were likely counted multiple times each monitoring season and therefore population trends cannot be established.

The drop in sightings from 2009 to 2010 was likely due to the fact that in 2009, productivity surveys were performed. Habitats that were occupied during the 2009 monitoring season were observed a fourth time to determine the number of chicks. This fourth survey added 3 sightings to the 9 observations during the regular 2009 monitoring efforts. Productivity surveys were not conducted in 2010; therefore, no chick sightings were made during this year's monitoring efforts. If it is deemed necessary in the future to obtain chick counts, the BLM mandated monitoring dates for mountain plovers should be extended until the end of June or early July to encompass the brood rearing season.

One factor that may affect how many plovers are observed during the breeding season is that mountain plovers often flush at 50 to100 meters when approached on foot and 3 meters when approached by vehicle. Therefore, a vehicle is used for monitoring efforts, and limited to existing roads and two tracks as per the 2008 Pinedale Resource Management Plan. There are sections of habitat not visible from existing roads, likely

causing some plovers to be missed. If ATVs were able to be utilized off of existing roads, the habitat could be searched more thoroughly.

Mountain plovers are habitat specialist; they depend on patches of low, sparse vegetation. These areas are often caused by poor soil quality, low precipitation, and constant wind scour (Beauvais and Smith 2003). These unique areas that provide mountain plovers with the appropriate breeding habitat are very important to the survival of the mountain plover. The following discusses the use of mountain plover habitat on the JIDPA and 3-mile buffer and ways to preserve and protect this valuable resource.

The mountain plover sightings made in 2010 were in Habitats 1, 26, 29, and 30. These same habitats were occupied in 2009 with the addition of Habitat 27. Out of the 27 mountain plover habits monitored each year, 9 habitats have been considered occupied from 1999-2010 (Table 4 and Map 4). To the best of Aster Canyon's knowledge, the remaining 18 habitats have never been occupied by mountain plovers. The most valuable data collected over the past 11 years is certain habitats are continuously occupied by breeding mountain plovers, while others have never been occupied. With this knowledge it seems that protection granted to consistently unoccupied habitats should be reevaluated and removed from monitoring efforts. Consequently, habitats where mountain plovers have been seen outside the delineated boundaries should be re-delineated such as Habitat 1. It was re-delineated to encompass an area to the north that was not included in the boundaries, mountain plovers were observed in this extended area in 2008 (Map 4)

Habitats that have been occupied warrant strict protection measures and mitigation techniques. The conservation of the relatively rare and small habitat patches on the landscape will be important for the protection of the mountain plover. These areas should be protected from disturbance at all times, not just the breeding season. The following provides information on how to preserve and protect mountain plover habitat.

Mountain plovers are often seen within historic dry earthen dam reservoirs located within habitat patches. Within these earthen dams the western tansy mustard (*Descurainia pinnata*) appears to provide valuable brood rearing habitat. Western tansy mustard attracts insects with it small yellow flowers mountain plovers consume. Tansy mustard is native to the United States it is important to desert ecosystems and usually appears in the early seral desert system. These areas of dense western tansy mustard should be preserved for their important foraging habitat.

Additionally, fences and windmills no longer in use should be removed from mountain plover habitats, as these features provide perch sites for predators. The maintenance of prairie dog towns is also important for the mountain plover because prairie dogs help maintain the sparse vegetation mountain plovers prefer.

If a temporary disturbance must be placed through a habitat such as a pipeline, extra precautions should be taken to reduce weed growth. The area should be surveyed for any weeds prior to disturbance, and any found should be eliminated before disturbance. All equipment entering the area should be thoroughly cleaned to prevent introducing weeds into the area. Pre-disturbance vegetation monitoring should be performed within these unique areas so a certified weed free seed mix can be designed matching the native plants in the area. The certified weed free mix should be purchased from a trusted company. Extra care should be taken to establish native plants quickly.

In conclusion, the mountain plover has been recorded within the current study area since 2000. The JIDPA and 3-mile buffer provide valuable breeding habitat to the mountain plover. These unique small breeding habitats should be protected and preserved from disturbance or if disturbance is unavoidable additional measures should be taken to reclaim the habitat as soon as possible, back to its native vegetation. With the preservation of these unique habitats, likely the mountain plover will continue to successfully nest within the JIDPA and 3-mile buffer.

5.0 LANDBIRDS

Birds reported on in this section are protected under the MBTA. Under the MBTA, the BLM and its lease holders 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, 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. Surveys were conducted by Aster Canyon biologist Jeanine Saia from 3 June to 14 June 2010, totaling 5 days of survey efforts.

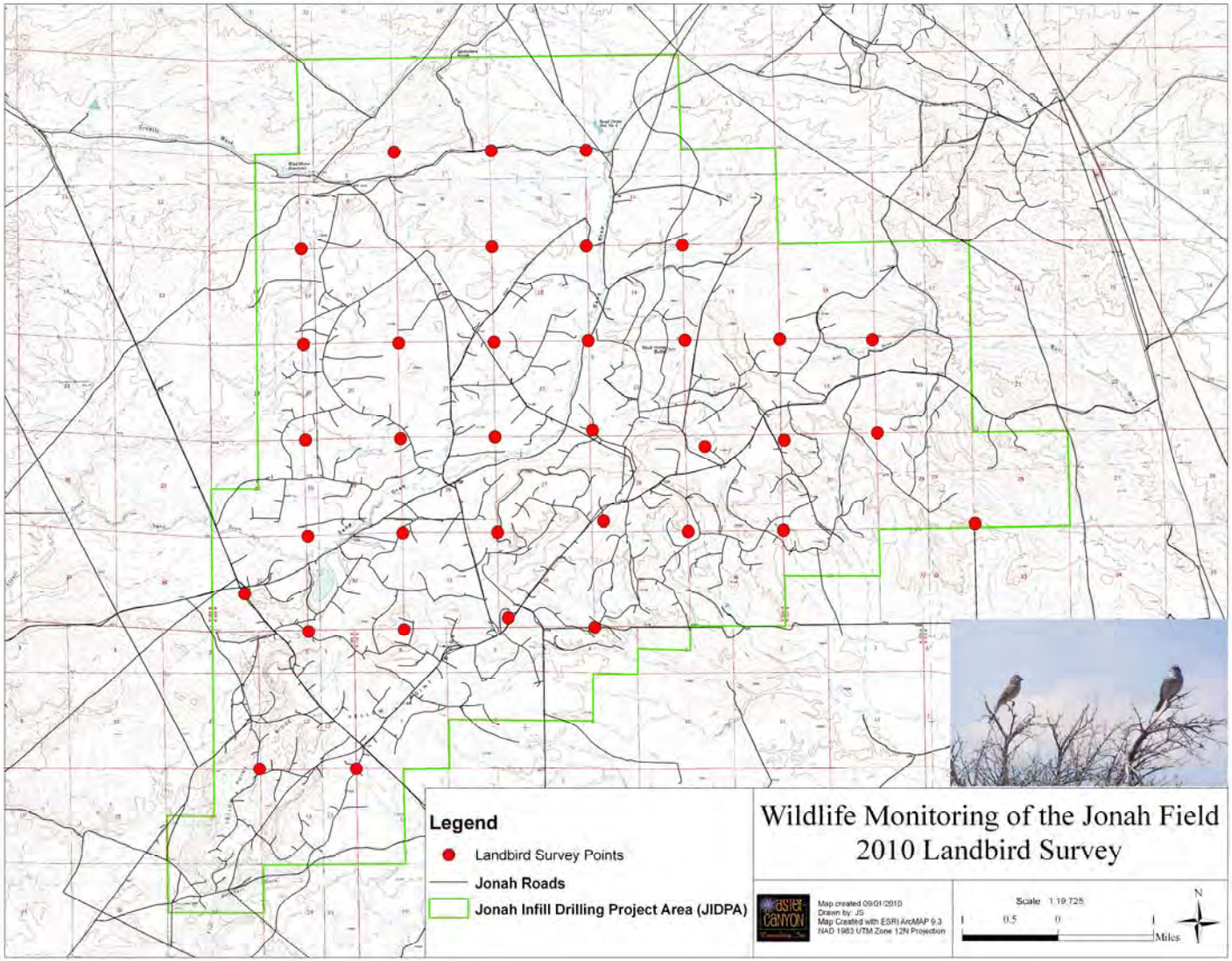
5.1 Landbird Methods

The Handbook of Field Methods for Monitoring Landbirds (Ralph 1993) along with the RMBO protocol was used to design the 2010 landbird study on the JIDPA (Appendix C-2). This entailed point counts established systematically throughout the JIDPA to be surveyed once during the 2010 season (Map 5). Since the JIDPA was surveyed intensely in 2007 and 2008, it was decided that a less rigorous study design could be used in 2010.

Thirty four point count survey locations were established at the corners of each section within the JIDPA boundary. Surveys were performed within a half hour of sunrise until 9:00 am. Point counts consisted of 2 consecutive 3 minute intervals where all birds seen, including flyovers (FO), or heard were recorded, making sure to record individual birds

only once for the entire survey. Weather data, including temperature and wind speed, was 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, etc.), or in winds above 15 mph. An example data sheet can be found in Appendix C-1.

A Brewer's sparrow and sage sparrow observed within Sand Draw on the JIDPA

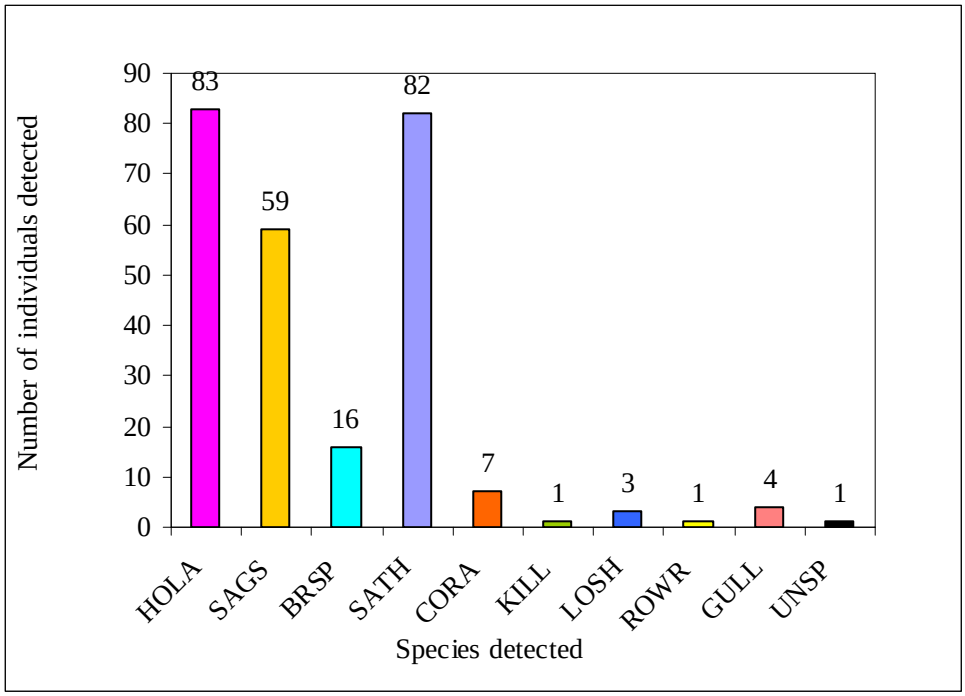


Map 5. Landbird survey points conducted in 2010 on the JIDPA.

5.2 Landbird Results

The results presented here include relative abundance of landbirds detected, species trends over time, and species diversity. Two hundred and fifty seven birds, comprised of 9 species and 1 unknown species were detected on the JIDPA (Figure 3 and Table 5). Four species were predominant; horned lark (*Eremophila alpestris*), sage thrasher (*Oreoscoptes montanus*), sage sparrow (*Amphispiza belli*), and Brewer's sparrow (*Spizella breweri*) (Figure 3). 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, and 7.6 birds/point in 2010.

Figure 3. Landbird species detected on the JIDPA June 3 – 14, 2010.



When trends were compared, the results from 2007-2010 were similar; the same four species were predominant in 2010 even with a much smaller sample size (34 points versus 225 points in 2007 and 2008) (Figure 4). These findings are described in detail below, separated by species. Loggerhead shrike (*Lanius ludovicianus*) is also mentioned in this section due to their WSS status.

Sage Thrasher (SATH): Eighty two SATH's were detected, comprising 32% of total landbirds. They were detected at 94% of the points. This is an 11% and 14 % increase respectively, when compared with 2007 and 2008 data.

Horned Lark (HOLA): Eighty three HOLA's were detected, also comprising 32% of total landbirds. This is slightly less than 2007 and 2008. They were detected at 85% of the points in 2010.

Sage Sparrow (SAGS): Fifty nine SAGS were detected, 23% of the total. This was a slight increase from 2007 and 2008.

Brewer's Sparrow (BRSP): Sixteen BRSP were detected, 6% of the total. They comprised 26% in 2007, and 21% in 2008.

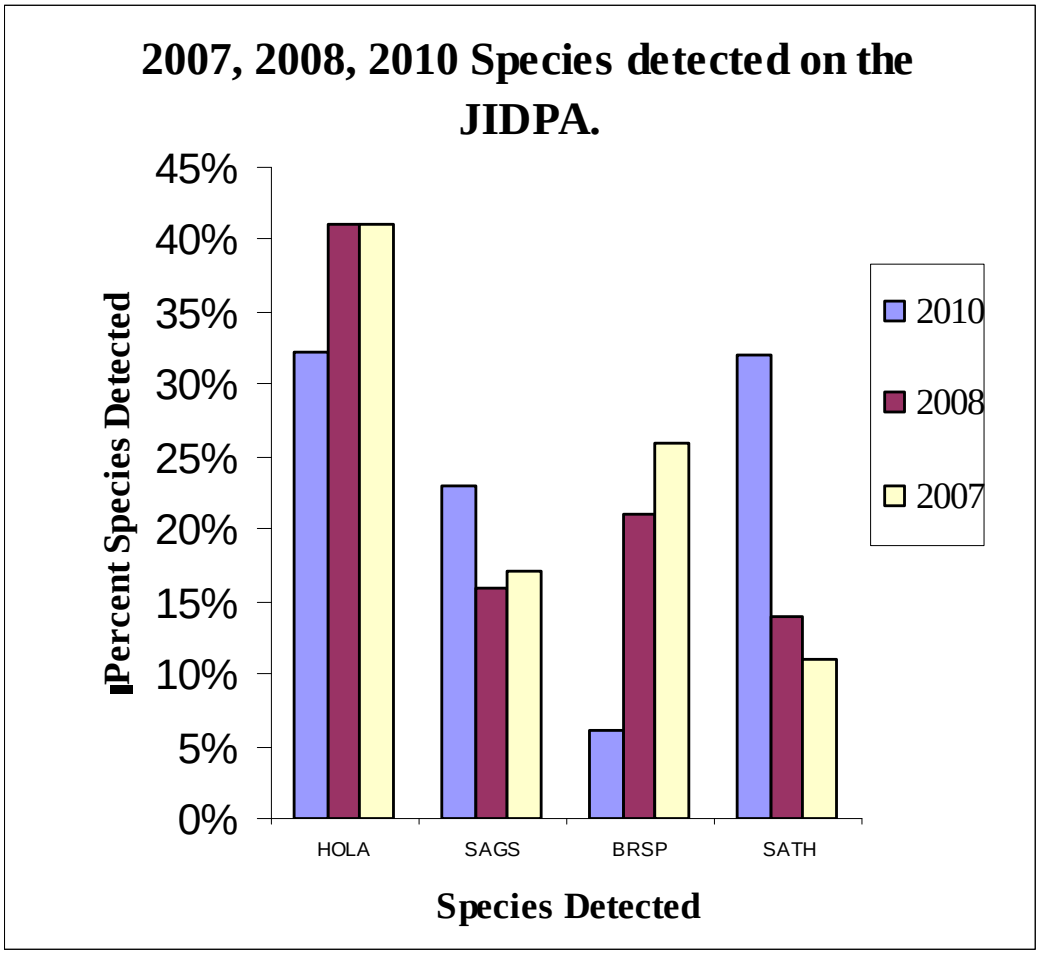
Loggerhead Shrike (LOSH): Three LOSH's were detected at 2 different points during the survey. In 2007, 3 were detected, and 5 in 2008.

Species diversity recorded in the 3 years of surveying appears to correlate directly with survey intensity: 22, 19, and 9 species were recorded in 2007, 2008, and 2010, respectively.

Table 5. Landbird species detected on the JIDPA during 2010 surveys: common name, four letter code, and scientific name.

COMMON NAME	4 LETTER CODE	SCIENTIFIC NAME
Brewer's sparrow	BRSP	*Spizella breweri*
Common raven	CORA	*Corvus corax*
Horned lark	HOLA	*Eremophila alpestris*
Killdeer	KILL	*Charadrius vociferous*
Loggerhead shrike	LOSH	*Lanius ludovicianus*
Rock wren	ROWR	*Salpinctes obsoletus*
Sage sparrow	SAGS	*Amphispiza belli*
Sage thrasher	SATH	*Oreoscoptes montanus*
Gull sp.	GULL	*Larus sp.*
Unknown	UNKS	

Figure 4. Landbird species detected on the JIDPA in 2007, 2008, and 2010.



5.3 Landbird Discussion

It is important to monitor populations of sagebrush obligate species listed as WSS, such as sage sparrow, sage thrasher, and Brewer's sparrow. These species are listed as Wyoming sensitive species due to population declines throughout their ranges. Their populations are monitored nationally by the breeding bird surveys (BBS). In this section relative abundance of landbirds, species trends over time and species diversity is discussed.

Abundance

Sage thrashers and horned larks were the most abundant birds, each comprising 32% of all detections, of the 2010 monitoring season. Horned larks forage on bare ground (Cariveau 2007); therefore they are abundant throughout the JIDPA. Ingelfinger (2001) suggested that as more roads are created, horned lark populations will increase. This could explain why horned lark populations were so abundant but it doesn't explain why there was less this year than 2007 and 2008. It could be due to reduced construction, areas have been successfully reclaimed, or possibly other sagebrush species have been successful at staking their territories as other studies suggest (Ingelfinger 2001).

More sage thrashers were detected this year than in previous years. This may be due to the fact that habitat changes dramatically year to year on the JIDPA with the construction of new pads, pipelines, and roads; therefore, variance in the data year to year is to be expected. In addition, the time of year surveys are conducted dictates which bird species are present, abundant, and most likely to be detected. Species migrate at different times, and when monitoring is conducted throughout the spring, a better chance of recording all species using the JIDPA during spring migration. Since surveys were conducted 5 mornings during the first 2 weeks of June in 2010, there may be bias in the percentage of birds detected.

The same logic may be applied to why there were fewer Brewer's sparrows in 2010 compared to previous years (Figure 4). It could be due to the time of year, construction, or there may actually be a declining trend in Brewer's sparrow population (Walker 2004).

Trends

Trends identified from the results of the 2010 landbird monitoring effort indicate that 2 species have increased detection when compared to the 2007 and 2008 data and 2 species have decreased in detection. In 2010 sage thrashers and sage sparrows have increased and the horned lark and Brewer's sparrow have decreased when compared to 2007 and 2008. Loggerhead shrikes should also warrant monitoring along with the sagebrush obligate species due to their sensitive status. The loggerhead shrike was detected at less point this year than in 2007 and in 2008.

Horned lark, a commonly seen species on the JIDPA.

Diversity

Species diversity was much higher in previous years than 2010. If species richness is the desired outcome, a more intense survey effort is necessary. One way to achieve this would be to intentionally survey cattle ponds and other standing water sources in the spring to observe waterfowl and wading birds. A northern pintail (*Anas acuta*) was spotted this year (but not included in the landbird data) and in previous years near cattle ponds. Other wading birds and shorebirds could be spotted here as well, including another WSS, the long billed curlew (*Numenius americanus*). Other species detected in the past near water sources on the JIDPA

include American avocet (*Recurvirostra americana*), Wilson's phalarope (*Phalaropus tricolor*), mountain bluebird (*Sialia currucoides*), and great blue heron (*Ardea herodias*). White-faced Ibis (*Plegadis chihi*) breed in the area, and it would be possible to spot one on the JIDPA, especially in early spring.

Surveying during the fall migration would also produce higher species diversity. Birds that could possibly be detected could include; northern shrike (*Lanius excubitor*), lark bunting (*Calamospiza melanocorys*), Baird's sparrow (*Ammodramus bairdii*), grasshopper sparrow (*Ammodramus savannarum*), upland sandpiper (*Bartramia longicauda*), McCown's longspur (*Calcarius mccownii*), chestnut-collared longspur (*Calcarius ornatus*), Sprague's pipit (*Anthus spragueii*), willow flycatcher(*Empidonax traillii*), ash-throated flycatcher (*Myiarchus cinerascens*), black crowned rosy finch (*Leucosticte atrata*), gray crowned rosy finch (*Leucosticte tephrocotis*), Cassin's finch (*Carpodacus cassinii*), and common snipe (*Gallinago gallinago*). Another strategy to bolster landbird detection would be to build nest boxes. Mountain bluebirds have been known to use nest boxes.

These population parameters (species abundance and richness) will provide the information for management of landbird populations across a broader scale and assist with future mitigation efforts.

6.0 PYGMY RABBIT

A sagebrush obligate species, the pygmy rabbit is a keystone species in big sagebrush communities. As one of only 2 leporid species in North America known to excavate its own burrows, the pygmy rabbit creates burrows and tunnels used by a variety of vertebrate and invertebrate species (WGFD 2005b). Additionally, pygmy rabbits are an important food source for many species (Keinath and McGee 2004).

The USFWS released its 12 month petition finding on the pygmy rabbit on 30 September 2010. They have determined the pygmy rabbit is not warranted for protection under the ESA (USFWSa 2010). The pygmy rabbit remains a WSS.

Under the 3 year cycle of pygmy rabbit monitoring efforts on the JIDPA, pygmy rabbit surveys were performed in 2010 to determine presence/absence and to obtain spatial distribution of burrows. Surveys were conducted from 14 July to 28 July 2010 by Aster Canyon biologists Shona Wilson, Nicole Thiele, Bob Chapman, Jeanine Saia, Evan Myers, Amy Hemenway, Amanda Taylor, and Dutch Daut.

Picture of a pygmy rabbit burrow found on the JIDPA in 2010.

6.1 Pygmy Rabbit Methods

Pygmy rabbit surveys were conducted in accordance with the Pygmy Rabbit Survey Protocol within the *Wildlife Survey Protocols, Pinedale Field Office version 2.2 May 2010* (Appendix D-2). An amendment to the BLM protocol provided specific procedures to follow when conducting 400 m by 400 m plot surveys (Appendix D-3), and the Pygmy Rabbit Monitoring Methods for the Jonah Field 2010 (Appendix D-4) detailed how plots were selected and data was recorded. A total of 11 survey days were logged by two 3-person teams of biologists following these techniques:

- One or two 400 m x 400 m plots were surveyed per section within the JIDPA.
- Plots consisted of 9 transects in a north-south orientation spaced 50 m apart, and a 50 m buffer around the outer boundary.
- Biologists walked meandering transects, targeting specific pygmy rabbit habitat (i.e. relatively taller, denser big sagebrush, rocky outcrops, and areas where the structure of the sagebrush stand is uneven in both height and density).
- Less desirable habitat, such as grassland or bare ground, was also surveyed but at a quicker pace.
- Each burrow system (not individual opening), pygmy rabbit sighting, and pellet pile (only if accompanied by a burrow) were recorded on data sheets (Appendix D-1)
- Burrow systems were recorded only if they were at least 30 ft from an adjacent burrow system.

Plot location was determined using random points provided by the BLM PFO that met certain criteria (e.g. sagebrush was present and plots did not overlap). Plots that did not meet these parameters were discarded. This process was followed until 2 plots had been surveyed in each of the 56 sections, until 23 July 2010 when the protocol switched

to one plot per section. On 8 October 2010 it was agreed that the BLM PFO seasonal employee would complete the remaining plots per section.

All surveys, attempted surveys, and discarded random points were tracked on the 2010 Jonah Field Pygmy Rabbit Survey Tracking Spreadsheet, provided by the BLM (Appendix D-6). Aster Canyon crew members participated in a pygmy survey training effort, which was put on by a BLM PFO biologist. This training requirement standardized all survey data collected by all field crews.

6.2 Pygmy Rabbit Results

In 2010, the entire JIDPA was surveyed for pygmy rabbits. Map 6 depicts 78 plots surveyed on 56 sections (22 of these sections had two plots surveyed, and 34 of these sections had 1 plot surveyed). Six sections of the JIDPA had only 1 viable plot due to restrictions in the protocol, the remaining 28 sections had only 1 plot surveyed due to budgetary and sample size concerns. These remaining 28 sections will be completed in the fall of 2010 by the BLM, results will be available from the BLM PFO. Fourteen separate observations of pygmy rabbit sign were reported in 9 sections on the JIDPA, with 90% of the sightings occurring in patches of tall, dense sage. No live rabbits were documented. Five reports of sign occurred in pygmy rabbit locations recorded in 2007 (Map 7).

Comparison photo showing the size difference between pygmy rabbit, cottontail, and jackrabbit pellets.

6.3 Pygmy Rabbit Discussion

In 2007, Aster Canyon located a total of 226 active pygmy rabbit burrow complexes and recorded 40 visual observations of rabbits within the JIDPA and the surrounding 3-mile buffer (Aster Canyon 2007). This data is in stark contrast to the 14 observations of sign and zero reports of live rabbits in 2010.

In 2007, surveys targeted areas of tall, dense sage by using a predictive pygmy rabbit habitat model that buffered stream channels, as opposed to the random sampling method implemented in 2010 that did not allow for the targeting of desirable habitat. As a result, the majority of 2010 plots did not contain any typical pygmy rabbit habitat as described in the literature (e.g. mima mounds, draws containing stands of tall, dense sagebrush, and rock outcroppings with adjacent tall sagebrush). In addition, many of the plots contained a large proportion of bare or developed ground (i.e. well pads and roads).

All of the 2010 observations fell within either previously documented pygmy habitat or model predicted habitat, emphasizing the benefits of stratified sampling. 90% of 2010 sightings fell within areas of tall, dense sage or rock outcroppings; suggesting that stratifying sampling by habitat type alone would greatly increase detection rates. Based on 2007 data and the high site fidelity of pygmy rabbits, large pockets of pygmy rabbit activity were not documented due to the randomization of the 2010 surveys.

Pygmy rabbits are not randomly distributed throughout the sagebrush; rather, they select for certain sagebrush characteristics and soil conditions (Keinath and McGee 2004). With a patchily distributed species such as the pygmy rabbit, random survey methods that might work well for a more evenly distributed species, are ineffective and inefficient. Inventory methods that target or stratify habitat would be more productive and cost effective. To improve the efficacy of inventory efforts in the future, sampling should use previously developed habitat models to predict potential pygmy rabbit

habitat (Aster Canyon 2007) or be stratified using shrub cover/height and soil layers. Greatest sampling effort should be focused in high potential habitat areas as predicted by the models and less effort in lower potential areas as a check on the model's ability to target habitat.

Relative abundance surveys are biased against pygmy rabbits because of the dense vegetation they prefer to live in, their limited home ranges, and other behavioral characteristics (Larrucea and Brussard 2008). Another confounding factor creating detection uncertainty is the fact that pygmy rabbit and cottontail (*Sylvilagus nuttallii*) pellets can overlap in size under certain conditions (young cottontails and pregnant pygmy rabbits). Although pygmy rabbits and cottontails can coexist, strict adherence to the BLM protocol may lead to the exclusion of sites in cases where there is overlapping cottontail sign, potentially skewing the data against pygmy rabbits. DNA analysis of pellets could be used to conclusively determine pygmy versus cottontail presence in questionable cases, allowing for a more accurate representation of occupancy and distribution. Genetic analysis of pellets would also provide important information regarding the genetic connectivity of JIDPA pygmy rabbits to other populations in the West and would be better use of limited funding for monitoring.

Efforts to identify and preserve existing pygmy rabbit habitat on the JIDPA are important to supporting viable populations. Habitat corridors between key habitat patches are critical for dispersal and to facilitate gene flow between populations. Culverts beneath roads may act as cover from predators in areas where roads must cross pygmy rabbit habitat. Rock piles, consisting of very large rocks, could provide crevices to offer additional protection to pygmy rabbits in fragmented corridors while restored natural plant communities reach maturation. Limiting the number of artificial perches available to avian predators would also benefit pygmy rabbits; this may include anti-perching devices on power poles and well pad locations.

7.0 WHITE-TAILED PRAIRIE DOG

White-tailed prairie dogs are a gregarious species inhabiting desert grasslands and shrub lands at elevations between 5,000 and 10,000 feet above mean sea level (Pauli et al. 2006, USFWS 2010b). They are found in the states of Wyoming, Colorado, Utah and Montana, with the majority of the range being in Wyoming (Keinath 2004, Pauli et al. 2006, USFWS 2010b). White-tailed prairie dogs are considered a keystone species, as they provide habitat for some species (e.g. burrowing owls, mountain plovers, etc.), and are prey items for others (e.g. black footed ferrets, ferruginous hawks, golden eagles, etc.) (Pauli et al. 2006).

White-tailed prairie dog

Historically, white-tailed prairie dogs occurred expansively throughout their range, but their current distribution and population has been reduced due to disease, habitat loss, and persecution as a pest (Keinath 2004, Pauli et al. 2006). These factors remain today, along with additional pressures from other sources of disturbance, including oil and gas development, urbanization, and recreational shooting (Keinath 2004, Pauli et al. 2006, USFWS 2010b). However, no research has been conducted to determine if these additional factors are causing a real problem or are only perceived to be a problem (Keinath 2004, Pauli et al. 2006, USFWS 2010b).

In 2004, the USFWS determined a petition to list the white-tailed prairie dog as a threatened or endangered species did not provide sufficient biological information to support the listing (USFWS 2010b). Debate continued regarding the USFWS's decision to deny the petition of 2004 (USFWS 2010b). In 2008, the USFWS reconsidered and began a status review for the white-tailed prairie dog (USFWS

2010b). On 1 June 2010, after reviewing potential impacts and assessing information regarding the status of white-tailed prairie dogs, the USFWS announced white-tailed prairie dogs did not warrant protection as a threatened or endangered species (USFWS 2010b). The USFWS agreed that white-tailed prairie dog populations are below historic levels, but their range has not greatly changed and large areas of habitat are still occupied (USFWS 2010b). In the filing, the USFWS cited Wyoming as having large tracts of land that are still inhabited by white-tailed prairie dogs (USFWS 2010b).

This monitoring effort is a continuation of the current wildlife monitoring plan for the JIDPA and will provide spatial distribution information and aid in the detection of other species that inhabit prairie dog towns such as mountain plovers and burrowing owls. Secondly, this endeavor provides data to monitor shifts in prairie dog towns along with long-term trends of town density. Finally, these results will assist in the regulatory planning efforts and facilitate future mitigation efforts. Provided with this report is a GIS layer of known white-tailed prairie dog towns within the JIDPA (Appendix E-4).

7.1 White-tailed Prairie Dog Methods

Monitoring of white-tailed prairie dogs on the JIDPA and 3-mile buffer consisted of visiting previously mapped prairie dog towns and areas of potential occupation. Areas of potential occupation were determined by reviewing aerial photos and field observations. These areas were visited by Aster Canyon biologists: Evan Myers, Shona Wilson, David Hohl, Josh Hemenway, Amy Hemenway, Josh Brown, Nicole Thiele, and Jeanine Saia to determine the presence or absence of white-tailed prairie dogs. White-tailed prairie dog surveys where conducted between 10 May and 15 August and consisted of 32 field days. Where white-tailed prairie dogs were discovered, the towns were mapped by Aster Canyon biologists using methods modified from the BLM White-tailed Prairie Dog Survey Protocol (Appendix E-1). The method consisted of following the outside edge of active towns by foot and taking GPS points at the

outermost burrows. The outermost burrows were determined to be open burrows, large enough for a prairie dog to gain entry (~ 10 centimeters in diameter or larger) regardless of activity, and ≤100 meters from a previously marked burrow. Unoccupied towns were not mapped and recorded as zero (0) acreage (see Table 6). New prairie dog towns were mapped and labeled with the next sequential number available in the prairie dog town database. In some instances, neighboring prairie dog towns merged, becoming one town. In such cases, the lowest town number of the two was used to name the newly merged town. All previously mapped towns maintained their labels, except in cases where towns merged.

7.2 White-tailed Prairie Dog Results

The 2010 white-tailed prairie dog mapping survey of the JIDPA and 3-mile buffer resulted in 26 active towns covering 2700.7 acres (see Table 6). Nine new towns were recorded, 7 previously recorded towns merged with neighboring towns, and 8 previously recorded towns were found to be no longer active (see Table 6). White-tailed prairie dog towns were found throughout the JIDPA with the highest concentration of towns centrally located in the JIDPA (see Map 8).

7.3 White-tailed Prairie Dog Discussion

Prairie dog towns are dynamic. The size and density of towns continually rise and fall (Keinath 2004, Pauli et al. 2006). Boundaries of towns move across the landscape as town populations expand and contract (Keinath 2004, Pauli et al. 2006). Evidence of this ebb and flow can be seen in the results of this year's survey when compared with previous years (see Map 8). For example, the merging of 4 previous towns into one larger town (prairie dog town 2) and the reduction in size of prairie dog towns 7 and 43. The expansion, merging and collapse of towns is to be expected (Keinath 2004, Pauli et al. 2006), especially as town population densities increase and towns become more susceptible to plague events. Plague has the potential to wipe out

entire prairie dog towns, but neighboring prairie dog towns may aid in repopulating the area (Keinath 2004, Pauli et al. 2006). Little is known about how to predict or treat plague events, making protection of prairie dog town complexes (i.e. groupings of prairie dog towns in close proximity to one another) all the more important.

Associated with white-tailed prairie dogs is the black-footed ferret, a species on the verge of extinction. Black-footed ferrets rely heavily on prairie dogs as a food source, and as historical prairie dog populations have declined, black-footed ferret populations have followed suit (USFWS 2009). Recovery efforts for the black-footed ferret include reintroductions into suitable habitat (USFWS 2009). No surveys for black-footed ferrets were required in 2010. The USFWS has determined the minimal area needed to support black-footed ferrets to be 200 acres of white-tailed prairie dog town (BLM 2010). Two prairie dog towns (2 and 6) in the JIDPA and 3-mile buffer surpass this minimal acreage, and one other town (5) is just shy of the minimal acreage (see Table 6).

Although white-tailed prairie dogs have been excluded from federal protection under the ESA (USFWS 2010b), their pivotal role in the environment necessitates safeguarding their populations and monitoring their existence across the landscape. Protection efforts on the JIDPA and 3-mile buffer should consist of directing development away from active towns and away from historic towns, as they have the potential to become re-colonized by nearby white-tailed prairie dog towns and/or may be occupied by other sensitive species. If development in areas occupied by white-tailed prairie dogs cannot be avoided, it is suggested that translocation of prairie dogs be considered.

Table 6. White-tailed prairie dog town acreages mapped on the JIDPA and 3-mile buffer in 2005, 2007, and 2010.

Prairie Dog Town	2005 Acres	2007 Acres	2010 Acres
PDT 1	347.0	265.9	147.6
PDT 2A	156.5	234.3	747.3
PDT 2B	65.2	34.9	joined PDT 2
PDT 2C	4.4	1.9	joined PDT 2
PDT 3A	1.8	**0.0**	**0.0**
PDT 3B	25.8	**0.0**	**0.0**
PDT 3C	X	5.1	71.2
PDT 4	114.3	60.3	**0.0**
PDT 5	102.7	188.8	185.0
PDT 6A	637.1	1040.8	790.4
PDT 6B	3.7	**0.0**	joined PDT 6
PDT 6C	16.6	NOT MAPPED	joined PDT 6
PDT 6D	7.5	NOT MAPPED	joined PDT 6
PDT 7	796.7	NOT MAPPED	150.7
PDT 9A	111.9	72.5	34.2
PDT 9B	166.0	156.2	80.4
PDT 11	89.8	50.3	65.3
PDT 26	37.5	0.2	**0.0**
PDT 26B	X	0.1	**0.0**
PDT 27	14.7	93.7	53.9
PDT 27B	X	X	26.7
PDT 28	169.0	NOT MAPPED	joined PDT 6
PDT 29	6.8	**0.0**	**0.0**
PDT 30	11.9	6.8	11.9
PDT 31	7.8	**0.0**	**0.0**
PDT 32	46.5	11.7	18.9
PDT 33	5.8	**0.0**	**0.0**
PDT 34	X	5.7	65.1
PDT 41	X	2.4	24.4
PDT 42	X	6.5	24.2
PDT 43	X	629.0	95.7
PDT 45	X	118.5	joined PDT 2
PDT 46	X	X	17.5
PDT 49	X	X	15.0
PDT 50	X	X	18.4
PDT 51	X	X	2.2
PDT 52	X	X	6.8
PDT 53	X	X	28.6
PDT 60	X	X	2.5
PDT 61	X	X	4.0
PDT 62	X	X	12.8
Total Acreage	**2947.1**	**2985.8**	**2700.7**

8.0 FENCE INVENTORY

As requested by BLM biologist Dale Woolwine, a fence inventory was added to the 2010 JIDPA monitoring effort. Aster Canyon biologists Evan Myers and Nicole Thiele surveyed all non-industrial fences within the JIDPA and 3-mile buffer between 18 May and 12 August 2010. The information gathered during the survey included fence characteristics (length, height, fence type, etc.), gates, cattle guards, wildlife collisions with the fence, wildlife crossings, and entanglements.

Fences can pose a problem for wildlife as they impede free movement and can cause death or injury from strikes or entanglement. Of greatest concern on the JIDPA are fence strikes by greater sage-grouse and entanglement of pronghorn antelope. This objective of this inventory is to provide data on locations of concern and where adjustments can be made to better allow movement of wildlife and reduce fence strikes on the JIDPA.

8.1 Fence Inventory Methods

The following describes the methods used during the 2010 fence inventory. Fences were inventoried following the Jonah Field Fence Inventory Protocol provided by the BLM received 22 April, 2010 (Appendix F-1). A GIS layer was provided by the BLM as a baseline for the fence monitoring. Additional fences were searched for and fences not located on the GIS layer were inventoried around section 32 in township29N, range109 and sections 3 and 10 in township28N, range107. Fences within 0.6 miles of a sage grouse lek were to be inventoried within the first 2 weeks of May. Due to snow and rain we inventoried the fences in the third week of May

Fences were surveyed by traveling along the fence by foot or vehicle and recording information in the Trimble data dictionary (provided by the BLM). The surveyor recorded fence height, distance between posts, and fence type (i.e. barbed wire, smooth wire, etc.), number of wire strands, and distance between strands. This information was

documented for each segment of fence. Measurements of fence characteristics were taken in several places along one fence segment in order to get an average for that portion of fence. Each segment of fence was longer than 50 feet in length with similar fence construction. Any change in fence construction not extending 50 feet or more was recorded as a "Notable Area". "Notable Areas" also consisted of locations where some concern, in regards to the fence, existed. These concerns included down or cut fence, and locations where cattle could pass through. Conditions of cattle guards and gates were also recorded.

8.2 Fence Inventory Results

The following presents the number of fence strikes, mortalities and fence characteristics. In 2010, 7 observed strike locations were detected in 52 miles of fence surveyed. The majority (4) of these strikes were from sage-grouse, with one sage-grouse fatality (Table 7). All observed sage-grouse strikes were in close proximity to leking areas. The rest of the strikes consisted of a pronghorn, horse, and one unknown (Table 7). Characteristics documented during this survey are presented in Table 8. The spatial data separated into 6 shapefiles can be found in Appendix F-3.

Table 7.Wildlife fence strikes by species on the JIDPA and 3-mile buffer in 2010.

Species	# Simple Strikes	# Strike Mortalities	Total
Sage Grouse	3	1	4
Pronghorn	1	0	1
Unknown	1	0	1
Horse	1	0	1
Total	**6**	**1**	**7**

Table 8. Fence characteristics documented on the JIDPA and 3-mile buffer in 2010.

Total Length	Fence Crossings	Gates	Cattle Guards	Notable Areas	Fence Strikes
52.21 Miles	49	103	31	75	7

8.3 Fence Inventory Discussion

This section discusses the fence strikes, mortalities, and recommendations for wildlife friendly fence and future monitoring on the JIDPA and 3-mile buffer. Several locations were observed where sage-grouse struck the fence near the leks in the northeastern section of the JIDPA (Map 9). These areas warrant further examination as they potentially represent good areas to utilize strike deterrents to aid in fence visibility, helping to reduce fence strikes in the future. Outside this area, only two other fence strikes were found. One horse strike was noted but it was thought to be non-lethal as only mane or tail hair was found. This was possibly due to the horse rubbing on the fence and getting its hair caught in the barbs. The other strike was an unknown species with the only evidence being an unidentifiable mass of flesh (see photograph on this page). This strike was more than likely a fatal strike. No remains were found in the surrounding area of this strike, without conclusive evidence, it was not reported as a mortality.

Unidentifiable mass of flesh detected during fence survey on the JIDPA and 3-mile buffer in 2010.

The majority of fence on the JIDPA is the standard 3 or 4 strand barbed wire fence, with the bottom strand being barbed and less than 12 inches from the ground. This fence type

hinders pronghorn movement (Harington and Conover 2006, Bleich et al. 2005). Payne and Bryant (1998) recommend a minimum height of 18 inches for the bottom strand of fence, with a smooth bottom strand of wire rather than barbed wire. The Jackson Hole Wildlife Foundation, suggest a minimum height of 16 inches and smooth wire for the bottom strand. These designs will allow pronghorn to go under the fence with minimal effort and reduce the chance of entanglement and possible injury.

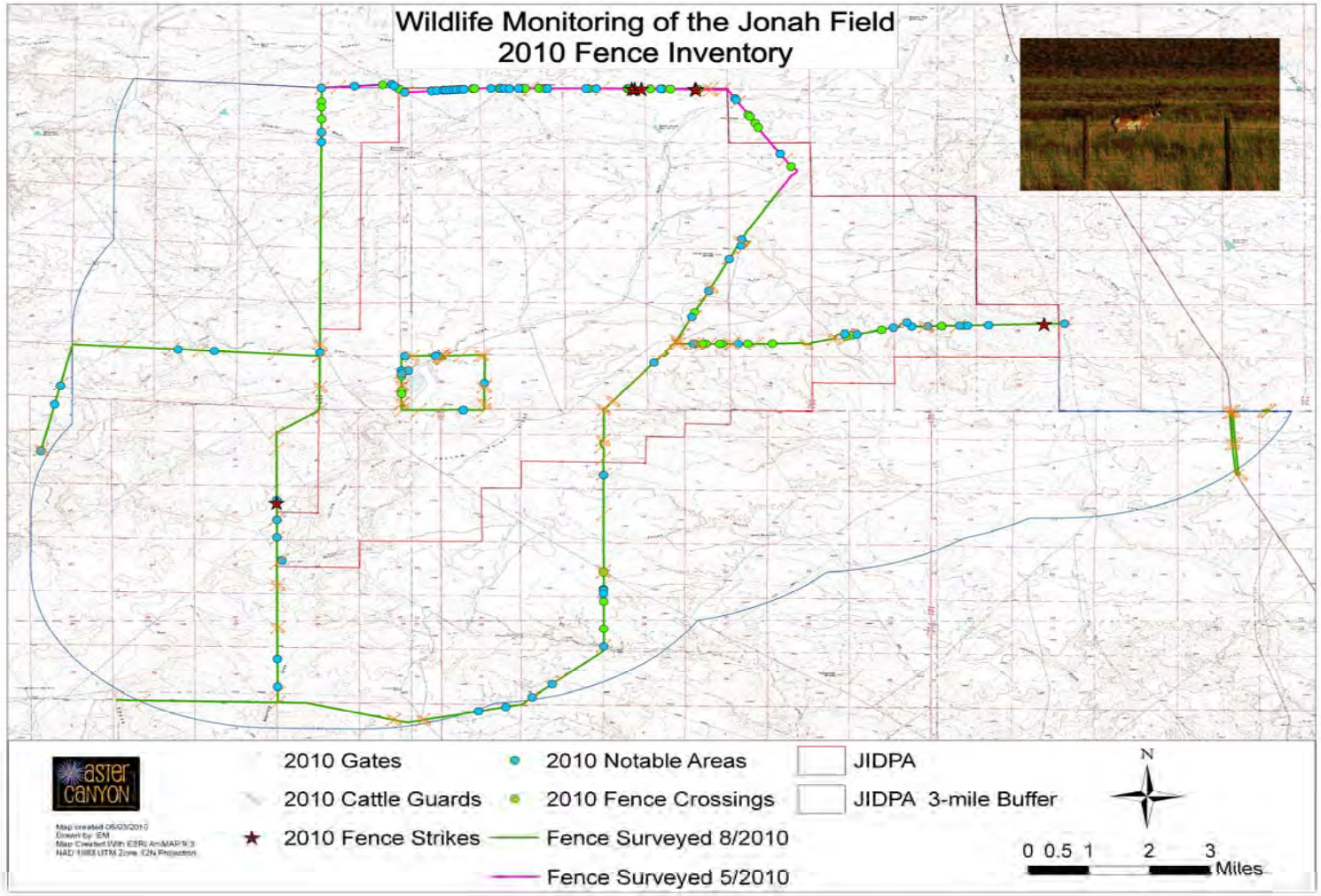
An example of wildlife friendly fencing

In order to reduce wildlife fence strikes and facilitate wildlife movement, it is recommended any unnecessary fence on the JIDPA and 3-mile buffer be removed. If a fence is desired, the fence should be a wildlife friendly fence such as the one shown in the adjoining photograph. This fence provides increased visibility and the bottom strand of wire is smooth and high enough from the ground to allow pronghorn to go underneath. It is also recommended to lay down sections of fence during heavy wildlife use periods, allowing wildlife to move freely through the area.

In the future, surveys for fence strikes should be conducted during times when strikes are most likely to occur (i.e. leking and migration). This will give surveyors an opportunity to find strikes with sign fresh enough to identify the animal that struck the fence, and not miss areas where scavengers have removed evidence of a strike.

In conclusion, greater sage-grouse were the most commonly reported strikes, these strike were all located on fences within .06 miles of a lek. It would be beneficial to add

deterrence to these fences. The fences located on the JIDPA and 3-mile buffer hinder the free movement of pronghorn and many low areas in the fences are reinforced with extra wire and wood that further prevent movement. Installation of wildlife friendly fencing or the temporary removal of unused fences would help prevent future injury and mortalities to traveling pronghorn.



Map 9. Location of fences surveyed and fence strikes detected on the JIDPA and 3-mile buffer in 2010

9.0 GENERAL WILDLIFE

Aster Canyon biologists recorded observations of rare, unusual, and sensitive species on the JIDPA and within the 3-mile buffer from 16 August 2009 to 15 August 2010. Observations were documented while traveling in the study area and conducting field surveys for focal species. To efficiently utilize inventory efforts, common species such as ravens, cottontail rabbits (*Sylvilagus nuttallii*), pronghorn (*Antilocapra americana*), prairie dogs, white-tailed jackrabbits (*Lepus townsendii*), and horned larks were not documented. The data in this section includes only incidental observations while conducting other inventory efforts in the study area. This data can be used to assess the statewide conservation status of these species and aid in decisions concerning petitions for endangered species status.

9.1 General Wildlife Methods

As per the WMPP, observations were made in accordance with the Wyoming Observation System (WOS) created by the WGFD. Species documented during specific surveys were not reported as part of the general wildlife observations. For example, raptors observed during raptor monitoring were not included. However, raptors observed during surveys for other species, were recorded.

9.2 General Wildlife Results

A total of 21 different species (7 mammalian and 14 avian) and 238 individuals were recorded during the 2010 field season (Table 9). Incidental sightings were documented throughout the JIDPA and 3-mile buffer (Map 10). Species of note include: moose (*Alces alces*), loggerhead shrike, short-eared owl (*Asio otus*), northern pintail, and the greater sage-grouse.

Table 9. List of all general wildlife observations on the JIDPA and 3-mile buffer in 2010.

Species	Number of Observations	Number of Individuals Observed
Birds		
American kestrel	2	2
Ferruginous hawk[1,3]	2	2
Golden Eagle[,4]	5	6
Greater sage-grouse[1,2,3]	16	97
Loggerhead shrike	1	2
Mourning dove	3	3
Northern harrier	3	3
Prairie falcon[1]	3	3
Short-eared owl	1	1
Canada goose	2	12
Rock wren	1	1
Red-tailed hawk	1	1
Mountain Plover[1,2,3]	1	3
Northern pintail	1	2
Mammals		
Badger	2	2
Coyote	3	3
Moose[3]	1	1
Long-tailed weasel	1	1
Wild horse	8	82
Striped skunk	1	1
13 lined ground squirrel	1	1

1 = BLM Sensitive Species
2 = Under review for ESA listing
3 =Species of greatest conservation need
4 = Bald eagle and Golden eagle Protection Act

Birds

The Canada goose detection was a flyover. The Northern pintails were document in the sage. Both waterfowl observations were made early in the season when water was still present in ditches and reservoirs. Numerous raptor species were reported hunting in the study area, including golden eagle.

Mammals

A moose was observed traveling through the southeast portion of the JIDPA. The animal reportedly browsed in reclaimed vegetation before moving on. Wild horses (*Equus ferus*) were reported, but only in the 3-mile buffer of the JIDPA. A thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*) was also reported. This species typically prefers grassy areas, but does persist in areas where reclamation practices increase grass species (Knopf 1996). A long-tailed weasel was also documented on the JIDPA.

Long-tailed weasel observed within the JIDPA

Amphibians and Reptiles

No amphibians or reptiles were recorded in the JIDPA study area in 2010. However there were unrecorded sightings of the greater short-horned lizard (*Phyrnosoma hernadesi*).

9.3 General Wildlife 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. Documenting the presence and distribution of some of these species on the JIDPA may be very useful in the future. General wildlife sightings presented here were most likely biased towards those species easily detectable from roads. Mitigation measures that will benefit all wildlife on the JIDPA include 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. The 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 oil field workers regarding the presence of sensitive species and how to work safely around wildlife should be a part of every proactive management plan. Seasonal noise limitations should also be considered.

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.

10.0 GREATER SAGE-GROUSE

Greater sage-grouse inventories within the JIDPA were not required in 2010. However, they were replaced with a fence inventory and other sage grouse studies in the Upper Green River Valley. All of our sage-grouse sightings were incidental and occurred while conducting surveys for other species or while driving to and from field sites. The most common form of detection was the discovery of sage-grouse pellets (both winter and spring). However, egg shell remnants, clockers, and roost sites were also recorded. Only reports of live animals are depicted on the general wildlife observation map (Map 11) and in Table 9.

Although their specific habitat requirements vary seasonally and over their life cycle, sage-grouse are a sagebrush-obligate species. Greater sage-grouse are widely considered in scientific and public arenas to be a species of significant conservation concern (Connelly and Braun 1997, Schroeder et al. 1999). In response to these concerns, states and provinces inhabited by sage-grouse have implemented extensive conservation efforts. After years of petitioning for protection under the ESA; in March of 2010, the Secretary of the Interior announced that the greater sage-grouse is “warranted but precluded by higher priority species” from listing under the ESA. Despite this ruling, sage-grouse remain a candidate species for federal protection and its status will be reviewed yearly.

Aster Canyon performed extensive surveys for sage-grouse in 2007, 2008, and 2009. Results from these surveys and current protection measures in place for sage-grouse on the JIDPA can be found in reports published by Aster Canyon (2007, 2008, and 2009).

11.0 BIG GAME

Inventories and monitoring for big game within the JIDPA were not required by Aster Canyon in 2010. A moose was seen traveling through the southeast portion of the JIDPA browsing on reclamation vegetation. Pronghorn antelope were the most commonly observed species of big game within the JIDPA this year. The JIPDA is heavily used by pronghorn during all times of the year. Aster Canyon has observed a group of approximately 1000 during the winter months, fawns have been seen being born during the spring, and pronghorn forage on the JIDPA and 3-mile buffer during the summer. Although pronghorn are ubiquitous on the JIDPA and throughout the Green River Basin, natural gas development and private housing subdivisions may be detrimental to pronghorn winter ranges and migration routes in these areas (Sawyer and Lindzey 2000). Aster Canyon conducted a fence inventory on the JIDPA in 2010 to examine fence crossings by pronghorn in the study area.

Pronghorn with young of the year observed on a well pad in the JIDPA in 2010.

Extensive energy development on the JIDPA can have a negative impact on pronghorn distribution; however, there is also evidence that some pronghorn on the JIDPA do not avoid areas with high levels of human activity (Berger et al. 2007). This species warrants continued management to monitor pronghorn behavior in relation to energy development. Currently multiple studies are underway to enhance knowledge of the pronghorn in the Upper Green River Valley.

12.0 CONCLUSION

The data presented in this report will assist in the long-term management of the JIDPA and its 3-mile buffer, by helping to maintain wildlife resources at appropriate levels. Wildlife population trend data was presented where available; however, it should be noted that trend analysis, for most species, has been affected by changes in the study area boundaries, specifically the reduction of the 3-mile buffer, and study design (i.e. pygmy rabbits and landbirds). Once wildlife population trend data becomes more reliable on the JIDPA, disturbance affects on wildlife resources will be more apparent and appropriate mitigation efforts can be developed.

Ongoing mitigation efforts, such as the avoidance of raptor nests and sage-grouse leks during critical time periods, and additions of artificial nesting structures, should continue. To further mitigation measures, steps should be taken to protect pygmy rabbit habitat and prairie dog towns where possible because of the critical role these species play in the environment. It is also recommended that all non-industrial fences be removed or replaced with wildlife friendly fences, allowing wildlife on the JIDPA to move freely and avoid unnecessary mortalities. Educating workers on the JIDPA about the importance of protecting wildlife will benefit all wildlife in the area.

Continued mitigation efforts and monitoring of wildlife resources on the JIDPA will improve conditions for wildlife and maintain wildlife populations in the future.

LIST OF ACRONYMS

Agencies and Companies:

BLM = Bureau of Land Management
JIO = Jonah Interagency 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:

BBS = Breeding Bird Surveys
EIS = Environmental Impact Statement
ESA = Endangered Species Act
GIS = Geographic Information Systems
GPS = Geographic Positioning Systems
JIDPA = Jonah Infill Drilling Project Area
MBTA = Migratory Bird Treaty Act
NEPA= National Environmental Policy Act
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
WMPP = Wildlife Monitoring Protection Plan
WOS = Wyoming Observation System
WSS = Bureau of Land Management Wyoming Sensitive Species

LIST OF DEFINITIONS

Artificial nesting structure = manmade structures placed in suitable nesting habitat to encourage birds to nest in the area. Artificial nesting structures for raptors usually consist of a telephone pole with a platform atop it.

Clocker = larger-than-normal intestinal droppings, 4-8 cm long and 1-3 cm in diameter. Females deposit these during incubation when feeding away from nests or near nest at time of hatching.

Elusive = used to describe a species that is rare or secretive and not easily detected.

Fidelity = quality or characteristic of being faithful. For birds, this is often used to refer to individuals that return to the same breeding ground on an annual basis.

Fledgling = young bird that has recently acquired its flight feathers or has just become capable of flying, are often still dependent on their parents for food for a week or more.

Keystone species=a species whose activities have a significant role in determining community structure.

Lek = gathering place of male greater sage-grouse to attract females for breeding by strutting and displaying; are adjacent to or in sagebrush-dominated habitat and typically are surrounded by potential nesting habitat.

Obligate = restricted to a particular condition of life, necessary for survival

Passerine = of, belonging, or pertaining to the order Passeriformes, comprising more than half of all birds and typically having the feet adapted for perching

Playa = round, seasonal depressions in the surface of the ground that fill with rainwater. The impermeable clay bottoms hold water for long periods through rainless months.

Take = to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect.

Unintentional take = take that results from, but is not the purpose of, the activity in question.

Whitewash = bird defecation, white in color, easily visible, and often indicating a nest or perch site.

COMMON AND SCIENTIFIC NAMES OF SPECIES PRESENTED IN THIS REPORT

COMMON NAME	SCIENTIFIC NAME
Birds	
American avocet	*Recurvirostra americana*
American kestrel	*Falco sparverius*
Ash-throated flycatcher	*Myiarchus cinerascens*
Baird's sparrow	*Ammodramus bairdii*
Black rosy finch	*Leucosticte atrata*
Brewer's sparrow	*Spizella breweri*
Cassin's finch	*Carpodacus cassinii*
Chestnut-collared longspur	*Calcarius ornatus*
Chipping sparrow	*Spizella passerina*
Common raven	*Corvus corax*
Common snipe	*Gallinago gallinago*
Grasshopper sparrow	*Ammodramus savannarum*
Gray crowned rosy finch	*Leucosticte tephrocotis*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
Great blue heron	*Ardea herodias*
Greater sage-grouse	*Centrocercus urophasianus*
Horned lark	*Eremophila alpestris*
Killdeer	*Charadrius vociferous*
Lark bunting	*Calamospiza melanocorys*
Loggerhead shrike	*Lanius ludovicianus*
Long billed curlew	*Numenius americanus*
Long-eared owl	*Asio otus*
McCown's longspur	*Calcarius mccownii*
Mountain bluebird	*Sialia currucoides*
Mountain plover	*Charadrius montanus*
Northern harrier	*Circus cyaneus*
Northern pintail	*Anas acuta*
Northern shrike	*Lanius excubitor*
Prairie falcon	*Falco mexicanus*
Red-necked phalarope	*Phalaropus lobatus*
Red-tailed hawk	*Buteo jamaicensis*
Sage sparrow	*Amphispiza belli*
Sage thrasher	*Oreoscoptes montanus*
Short-eared owl	*Asio flammeus*
Sprague's pipit	*Anthus spragueii*
Upland sandpiper	*Bartramia longicauda*
Western burrowing owl	*Athene cunicularia*
White-faced ibis	*Plegadis chihi*

Willow flycatcher	*Empidonax traillii*
Wilson's phalarope	*Phalaropus tricolor*

Mammals

American badger	*Taxidea taxus*
Black-footed ferret	*Mustela nigripes*
Coyote	*Canis latrans*
Moose	*Alces alces*
Mountain cottontail	*Sylvilagus nuttallii*
Pronghorn	*Antilocapra americana*
Pygmy rabbit	*Brachylagus idahoensis*
Thirteen-lined ground squirrel	*Spermophilus tridecemlineatus*
White-tailed jackrabbit	*Lepus townsendii*
White-tailed prairie dog	*Cynomys leucurus*
Wild horse	*Equus ferus*

Plants

Cheatgrass	*Bromus tectorum*
Rabbitbrush	*Chrysothamnus* spp.
Sagebrush	*Artemisia* spp
Saltbrush	*Atriplex* spp.
Western tansy mustard	*Descurainia pinnata*
Wyoming big sagebrush	*Artemisia tridentata* var. *wyomingensis*

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