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**ATTACHMENT P-8  
BIOLOGICAL FIELD SURVEY TECHNICAL REPORTS**

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## **P-8A – Greater Sage-Grouse Aerial Surveys Technical Report**

## **2011 Report**



**TETRA TECH**

**Boardman to Hemingway  
Transmission Line Project**

**2011 Greater Sage-grouse Aerial Surveys**



**4234RPT.DOC  
August 2011**

# **Boardman to Hemingway Transmission Line Project**

## **2011 Greater Sage-grouse Aerial Surveys**

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Tetra Tech Project No. 8540146.107.005.04

August 2011

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## 1.0 INTRODUCTION

Idaho Power Company (Idaho Power) is proposing to construct and operate a new, approximately 300-mile-long, single-circuit 500 kilovolt (kV) electric transmission line between northeast Oregon and southwest Idaho (hereinafter the B2H Project or Project). The overhead, 500 kV transmission line will carry energy bi-directionally between a Portland General Electric (PGE) planned substation (Grassland Substation) adjacent to the Boardman Generating Plant, near Boardman in Morrow County, Oregon, and Idaho Power's existing Hemingway Substation, located in Owyhee County, Idaho (**Figure 1**). The Project will traverse federal, state, and private lands in six counties in Oregon and Idaho.

The Project would result in disturbances related to the construction of permanent facilities such as transmission tower pads, substations, regeneration stations, and permanent access roads, as well as temporary disturbances related to fly yards, lay down areas, tensioning sites, and temporary access roads. To help determine the degree of impact that could occur due to the construction and operation of these Project components, the occurrence of greater sage-grouse (*Centrocercus urophasianus*) along the Project needs to be determined. Of particular interest are the locations of sage-grouse breeding grounds (leks) in relation to proposed Project components.

The Project, as proposed, would cross both public and private lands. Public lands that would be crossed are managed, in part, with the intent of conserving and improving wildlife populations, and public land managers have gathered data on lands they manage over the years. Data for private lands, with the exception of some statewide data gathered by state wildlife management agencies, are largely unavailable. This means that existing databases could not always be used to determine the locations of sage-grouse leks that could be impacted by the Project consistently across jurisdictions. Therefore, sage-grouse lek surveys were implemented to supplement existing data.

## 2.0 SURVEY AREA

The approach to delineating survey areas began by identifying where the proposed route and alternatives for the transmission line intersected sage-grouse habitat. This was initially completed using known species distribution and vegetation data. A three-mile buffer on each side of the proposed route and alternatives was incorporated to satisfy the Oregon Department of Fish and Wildlife (ODFW) recommendation of siting transmission lines at least two miles from occupied leks (ODFW 2009), with an additional mile to allow Idaho Power flexibility in making siting adjustments if needed. Meetings with both state and Federal biologists prior to the 2010 survey effort further refined the survey area based on the biologist's familiarity with the species and the quality of habitats within their management districts.

The Idaho Power sage-grouse surveys were designed to be completed over a two-year period in 2010 and 2011. The 2010 survey (URS, 2010) area included sections of the proposed route that are adjacent to known occupied leks where identification of a new lek(s) would not allow for siting the transmission line outside of the two-mile avoidance buffer. The 2011 survey area included the remainder of potential sage-grouse habitat not surveyed in 2010 and covered areas with lower known occupied lek densities. Survey areas for 2010 and 2011 are shown in **Figure 2**.

### 3.0 METHODS

Survey methods utilized for this study come from the lek search procedures described in the ODFW Greater Sage-grouse Conservation Assessment and Strategy for Oregon (Hagen 2005) and were adapted for this Project and included in the 2011 Biological Survey Work Plan (Tetra Tech, 2011). In general, the survey areas are flown by helicopter in transects spaced ¼-mile apart. The helicopter flies 20 – 50 feet above the ground at speeds ranging from 30 – 50 mph. Surveys typically began 15 – 20 minutes before sunrise and continue for 2 hours after sunrise. The survey area was flown twice between March 22<sup>th</sup> and May 1<sup>st</sup>, 2011 in two separate survey periods.

The survey crew used GPS technology for data collection activities. A Trimble GeoXT resource-grade receiver loaded with Terrasync software was used for navigation within the survey area. Sage-grouse observations were marked using Garmin hand-held GPS units. Corresponding notes were written on ODFW paper flight logs and observation forms (**Appendix A**). Pictures were taken at each observation site (**Appendix B**).

Aerial lek searches were performed using a Bell 206 Jet Ranger operated by JL Aviation out of Boring, Oregon. The lead observer was Mike Schlegel, a retired regional wildlife biologist with Idaho Department of Fish and Game. Both JL Aviation and Mr. Schlegel have several years of experience flying sage-grouse and other wildlife surveys for ODFW. URS Corporation of Boise, Idaho as a subcontractor to Tetra Tech, coordinated survey efforts and provided a second observer.

### 4.0 RESULTS

A total of 29 observations were recorded during the 2011 sage-grouse surveys. An observation can include one to dozens of sage-grouse; and correlates to a waypoint recorded at the location where the bird(s) are observed. The results of the sage-grouse survey are presented chronologically by survey period.

#### Survey Period 1

The first survey period occurred over a 10-day duration from March 22<sup>nd</sup> to March 31<sup>st</sup>. Surveys began in the Brogan, Oregon area and moved south and east towards the Oregon/Idaho border and into Owyhee County, Idaho. Results of Survey Period 1 are displayed in **Table 1**.

**Table 1. 2011 Sage-grouse Survey Results for Survey Period 1.**

Date	Data Sheet GPS ID	Waypoint	Mile post	M <sup>1</sup>	F <sup>2</sup>	U <sup>3</sup>	Total	Strutting	Known Lek
3/22	444	1	210	NC <sup>4</sup>	NC	NC	NC	Yes	Willow Creek Bench
3/22	446	2	211	0	1	0	1	No	No
3/22	448	3	221	0	0	1	1	No	No
3/22	452	4	222	2	2	0	4	No	No
3/23	475	5	229	0	1	0	1	No	No
3/23	484	6	227	3	1	0	4	Yes	No (Near Grouse Springs)
3/27	581	7	181	0	1	0	1	No	No
3/28	452	4	222	4	0	0	4	Yes	No
3/28	484	6	227	1	0	1	2	No	No (Near Grouse Springs)
3/29	668	8	150	2	0	1	3	No	Crews Creek
3/29	669	9	148	0	1	0	1	No	No
3/29	671	10	144	2	1	0	3	No	No (Near Salt Creek, Antelope, and Pond)
3/29	673	11	144	0	2	0	2	No	No
3/30	677	12	139	4	0	0	4	No	Hilltop
3/30	716	13	143	1	0	0	1	No	No

<sup>1</sup> M = Number of male sage-grouse observed.

<sup>2</sup> F = Number of female sage-grouse observed.

<sup>3</sup> U = Number of unknown sex sage-grouse observed.

<sup>4</sup> NC = No Count; Grouse were observed but an accurate count was not available.

Sage-grouse were observed on March 22<sup>nd</sup> and March 23<sup>rd</sup> (**Figure 3**) within the survey area from milepost 210 to 230. A total of six observations were recorded within these two days.

Waypoint 1 confirmed activity at the Willow Creek Bench occupied leks. Males were seen strutting at a distance and since the leks were outside of the survey area, an exact count was not taken and therefore Table 1 shows a value of 'NC' for the number of sage-grouse observed.

Waypoint 4 is directly under the proposed route between milepost 221 and 222. At this location, 2 male and 2 female sage-grouse were flushed on March 22<sup>nd</sup>.

On March 23<sup>rd</sup>, birds were recorded at Waypoint 6 approximately 2.8 miles west of milepost 227 of the proposed route. A female sage-grouse with 3 strutting males were observed at this location. Waypoint 6 is within 2 miles of the Grouse Springs occupied lek. The Grouse Springs lek is just outside of the survey area west of milepost 229.

Waypoints 2, 3, and 5 were all single birds that were flushed and subsequent investigations of these areas did not result in additional sage-grouse sightings that would lead observers to suspect lekking activity.

On March 24<sup>th</sup>, fog prevented surveys from occurring between approximately milepost 230 to 242.

Surveys on March 24<sup>th</sup>, 25<sup>th</sup>, and 26<sup>th</sup>, were performed in the survey area from milepost 242 to the Hemingway Substation at milepost 299; no sage-grouse were observed. Sage-grouse habitat in these areas is marginal to poor in quality.

On March 27<sup>th</sup> and March 28<sup>th</sup> the survey area south and east of Baker City, Oregon to Huntington, Oregon was flown (**Figure 4**). This area occurs from approximately milepost 175 to 198. A single female sage-grouse (Waypoint 7) was identified. Topography in this portion of the survey area was steeper than what would be expected for sage-grouse leks, as lek sites tend to be found in open areas with little topographical relief.

On March 28<sup>th</sup>, the survey area from milepost 230 – 242 was completed and no sage-grouse were observed.

During the March 28<sup>th</sup> survey Waypoints 4 and 6 from previous flights were revisited to verify sage-grouse activity. Activity was confirmed at Waypoint 4 when two strutting males were identified and two other male sage-grouse were flushed. Activity was also confirmed at Waypoint 6 when one male and one unknown sex sage-grouse were flushed.

The remainder of the sage-grouse survey area was flown on March 29<sup>th</sup> and 30<sup>th</sup>. This area occurs north of Highway 86 from approximately milepost 122 to 150 (**Figure 5**). Six observations were recorded with a total of 14 birds observed. Waypoint 8 flushed two male sage-grouse and one unknown sex sage-grouse; this observation confirms activity at the occupied Crews Creek lek (**Figure 5**). Waypoint 10 flushed two males and one female; this observation was within 0.5-mile of the Salt Creek occupied lek. Activity was also confirmed at the Hilltop lek, where Waypoint 12 recorded four male sage-grouse. Waypoints 9, 11, and 13 do not indicate potential lek activity in the vicinity of those observations.

## Survey Period 2

The second Survey Period occurred over a 10-day duration from April 18<sup>th</sup> to April 27<sup>th</sup>. Surveys began at the north end of the survey area near Baker City, Oregon and the survey crew worked south through the survey area. Results of Survey Period 2 are displayed in **Table 2**.

No sage-grouse were observed on April 18<sup>th</sup> when the most northern portion of the survey area was flown. The survey area north of Thief Valley Reservoir (approximately milepost 136 to 122) contains marginal sage-grouse lek habitat. While sagebrush habitat occurs in the area, numerous private land conversions are interspersed throughout including the operational Elkhorn Valley wind project. In addition, some of the survey area contains steep slopes and juniper encroachment. All of these factors combine to make establishment of a lek in this area unlikely.

On April 19<sup>th</sup> the remainder of the survey area north of Oregon State Highway 86 was completed. Five sage-grouse observations were recorded, with Waypoints 16 and 17 indicating potential lek activities (**Figure 6**). Waypoint 16 recorded two to three strutting males with a total of 11 male sage-grouse being flushed from the location. Waypoint 17 recorded one strutting male with a total of three male sage-grouse being flushed.

On April 20<sup>th</sup> and 22<sup>nd</sup>, the survey area south and east of Baker City, Oregon to Huntington, Oregon was flown (approximately milepost 175 to 198). Rain canceled the April 21<sup>st</sup> survey date. A total of three observations of single female sage-grouse occurred (**Figure 7**).

**Table 2. 2011 Sage-grouse Survey Results for Survey Period 2**

Date	Data Sheet GPS ID	Waypoint	Mile post	M <sup>1</sup>	F <sup>2</sup>	U <sup>3</sup>	Total	Strutting	Known Lek
4/19	3	14	140	0	1	0	1	No	No
4/19	4	15	144	1	0	0	1	No	No
4/19	5	16	144	11	0	0	11	Yes	No (Near Salt Creek, Antelope, and Pond)
4/19	6	17	144	3	0	0	3	Yes	No (Near Salt Creek, Antelope, and Pond)
4/19	7	18	145	1	1	0	2	No	No (Near Antelope)
4/20	8	19	177	0	1	0	1	No	No
4/20	10	20	182	0	1	0	1	No	No
4/20	11	21	186	0	1	0	1	No	No
4/23	451	22	222	0	1	0	1	No	No (Near Waypoint 4)
4/23	454	23	220	0	1	0	1	No	No
4/23	18	24	221	6	0	0	6	No	No (Near Waypoint 4)
4/24	452	4	222	5	0	5	10	No	No
4/24	452	4	222	0	0	10	10	Yes	No
4/24	484	6	227	0	0	3	3	No	No (Near Grouse Springs)

<sup>1</sup> M = Number of male sage-grouse observed.

<sup>2</sup> F = Number of female sage-grouse observed.

<sup>3</sup> U = Number of unknown sex sage-grouse observed.

From April 23<sup>rd</sup> through April 27<sup>th</sup> the remainder of the survey area from Brogan, Oregon to the Hemingway Substation in Owyhee County, Idaho was flown (milepost 210 to 299). Sage-grouse were observed on April 23<sup>rd</sup> and April 24<sup>th</sup> (**Figure 8**). Waypoint 24 flushed six male sage-grouse. Both Waypoints 4 and 6 from Survey Period 1 were confirmed to have sage-grouse activity again. Waypoint 4 was checked at the end of the April 23<sup>rd</sup> survey and at the beginning of the April 24<sup>th</sup> survey and both observations recorded at least 10 birds; with several strutting males confirmed on the April 24<sup>th</sup> flight. No strutting males were recorded at Waypoint 6 as three unknown sex sage-grouse flushed before they could be closely observed.

Surveys were cancelled on April 25<sup>th</sup> due to rain. The remainder of the survey area (approximately milepost 240 to 299) was flown on April 26<sup>th</sup> and April 27<sup>th</sup>; no sage-grouse were observed. As previously stated, the habitat in this area is of poor condition and establishment of leks by sage-grouse is unlikely.

## 5.0 CONCLUSION

Aerial surveys for sage-grouse leks were conducted from March 22nd through April 27th, 2011 at specific locations of the Project identified by ODFW and IDFG biologists. The goal of this survey was to identify sage-grouse leks that were previously unknown within 3-miles on each side of the proposed centerline of the Project. Surveys were conducted in Owyhee County, Idaho and Malheur and Baker counties in Oregon. No sage-grouse were observed in the Idaho portion of the survey area.

The formal designation of occupied and active sage-grouse leks in Oregon is the responsibility of ODFW. To assist ODFW in the lek designation process, this survey identified sage-grouse observations that could potentially be considered occupied leks. ODFW defines a lek as a site where two or more individual males are strutting for the purpose of mating, at two or more times in the breeding season (Hagen 2005).

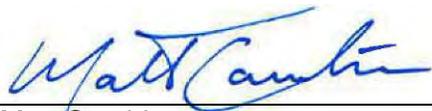
Of the 29 observations recorded, only Waypoint 4 (**Figure 9**) meets the criteria defined by ODFW to identify a lek. At least two male sage-grouse were observed strutting at this location on March 28<sup>th</sup> and April 24<sup>th</sup>. During the April 24<sup>th</sup> observation, more than 10 sage-grouse were seen including several strutting males but an accurate count could not be made before the birds flushed. Other observations (Waypoints 22 and 24) near Waypoint 4 included a female grouse and six male grouse. This additional activity around Waypoint 4 supports the conclusion that this area supports an occupied lek that was previously unknown to ODFW

Strutting male sage-grouse were seen at Waypoint 6 on March 23<sup>rd</sup> (**Figure 9**); however, subsequent visits could not confirm the presence of strutting males. The lack of a second observation of strutting males makes this observation fall short of the requirements identified by ODFW to be considered an occupied lek.

Observations made at Waypoint 10 during Survey Period 1 recorded two male and one female sage-grouse and observations made at Waypoint 17 during Survey Period 2 recorded three male sage-grouse and strutting was documented (**Figure 10**). The distance between these two waypoints is approximately 0.10 mile, and is close enough that these observations could be considered to have occurred at one common location. The distance from Waypoints 10 and 17 to the occupied Salt Creek lek is approximately 0.6 mile. The lack of two observations of strutting males during the same breeding year makes Waypoints 10 and 17 fall short of the requirements identified by ODFW to be considered an occupied lek.

Observations at Waypoint 16 (**Figure 10**) during Survey Period 2 recorded a total of 11 male sage-grouse. Two to three of those grouse were seen strutting before the rest flushed. Like Waypoint 6, a second observation of strutting males did not occur; however, the relatively high activity at this site warrants attention and discussion with ODFW.

Prepared by:



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Reviewed by:



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Supervising Scientist, Tetra Tech

## 6.0 REFERENCES

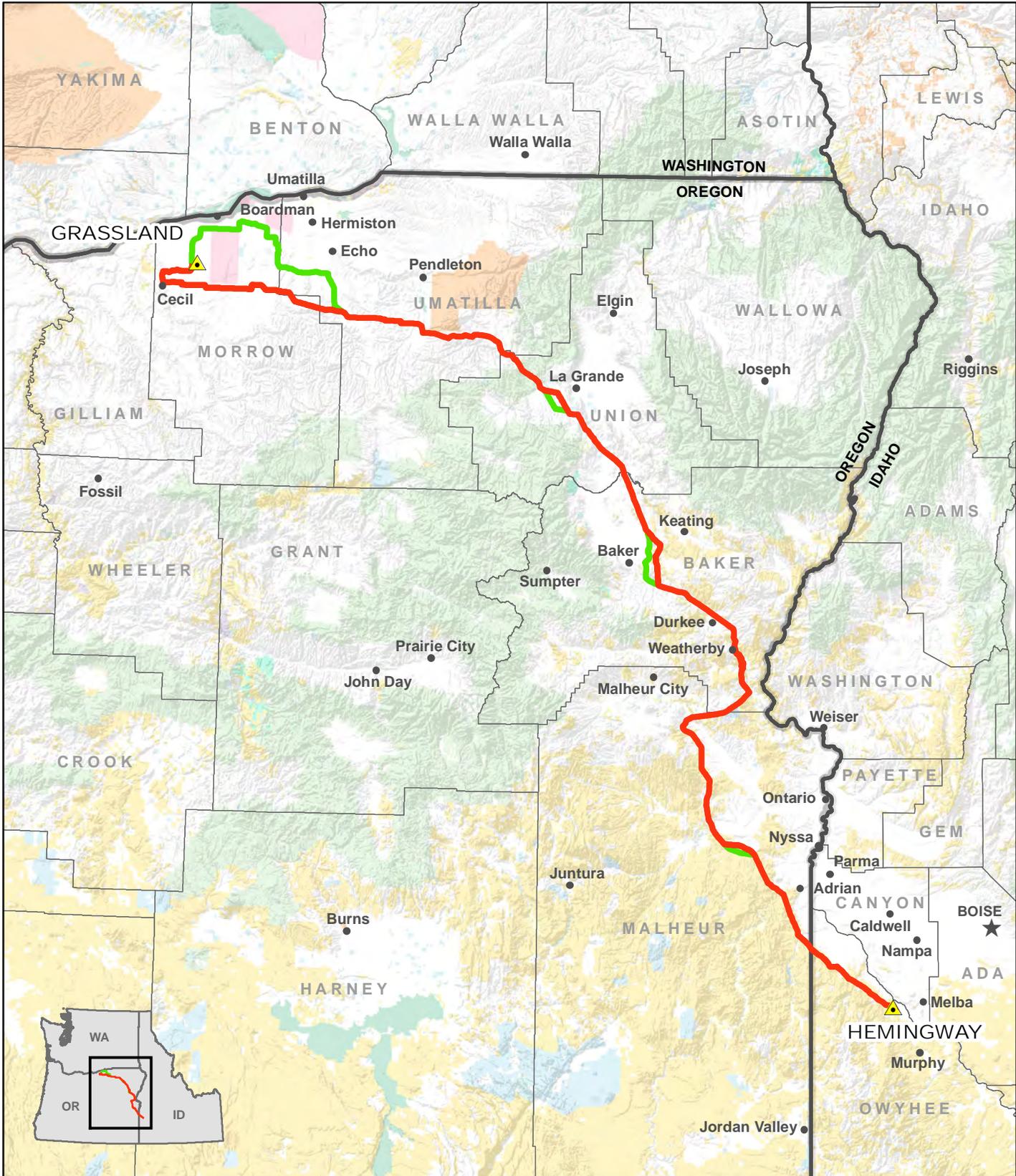
Hagen, C. A. 2005. *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat*. ODFW, Salem, OR.

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Tetra Tech, Inc. 2011. *Revised Final Biological Survey Work Plan Volume 1, Boardman to Hemingway Transmission Line Project*. Prepared for Idaho Power Company. Boise, ID.

URS Corporation. 2010. *Technical Report 2010 Greater Sage-grouse Aerial Surveys for the Boardman to Hemingway Transmission Line Project*. Prepared for Idaho Power Company. Boise, ID.

## **FIGURES**



**Project Features**

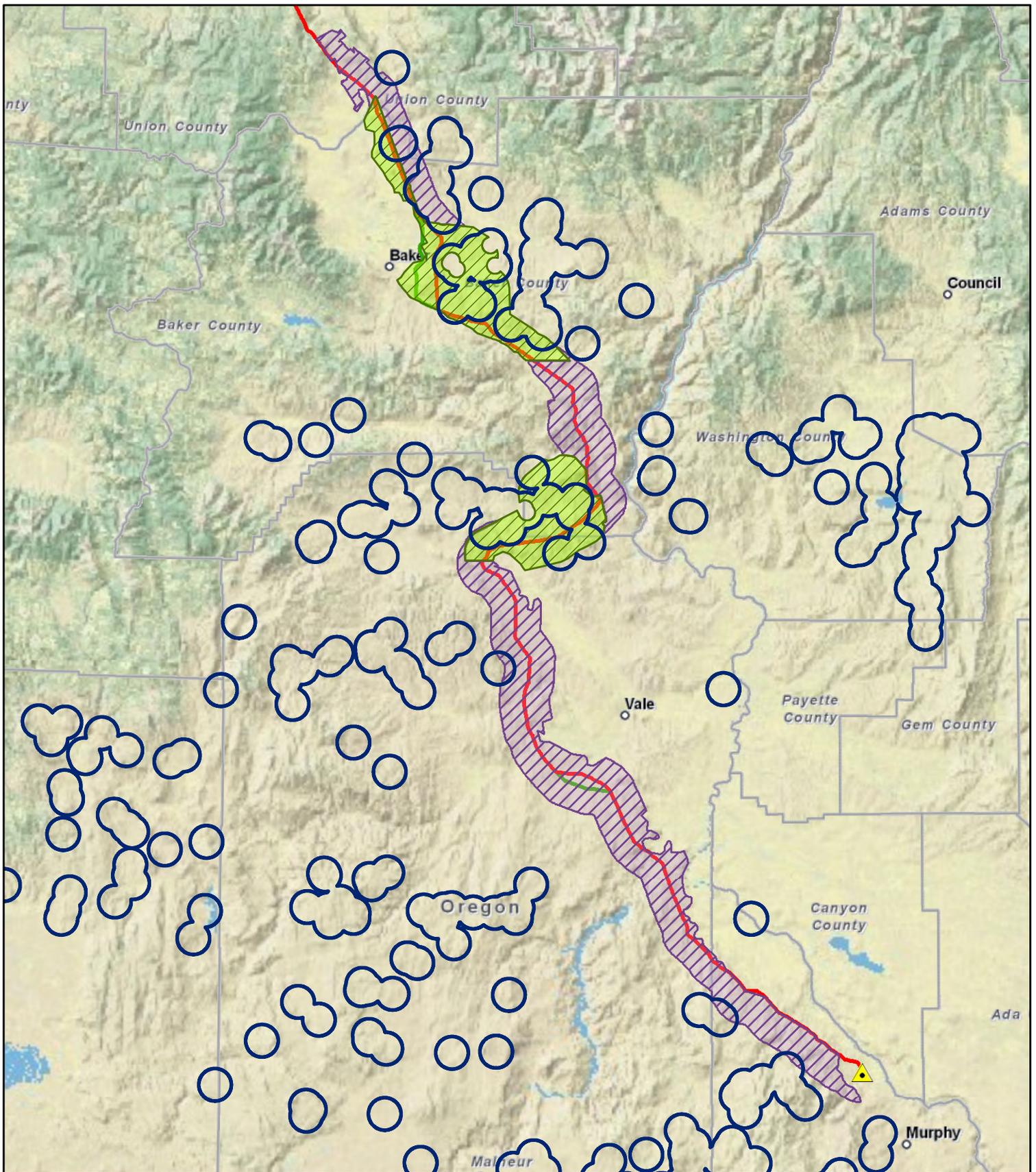
- Substation
- Proposed Route
- Alternative Route
- County Boundary
- State Boundary

**Land Status**

- Bureau of Land Management
- Indian Reservation
- Bureau of Reclamation
- Military
- State Land
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- Private Land

**FIGURE 1  
PROPOSED ROUTE AND  
ALTERNATIVES**  
**IDAHO POWER COMPANY  
BOARDMAN TO HEMINGWAY  
500kV TRANSMISSION LINE PROJECT**

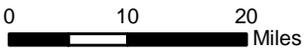
**AUGUST 2011**



**FIGURE 2 - B2H 2010 & 2011 SAGE-GROUSE SURVEY AREAS**

-  2011 Sage-grouse Survey Area
  -  2010 Sage-grouse Survey Areas
  -  ID\_OR\_Occupied\_Leks
  -  Substation
- B2H Transmission Line Routes**
-  Proposed
  -  Alternative





0 10 20 Miles



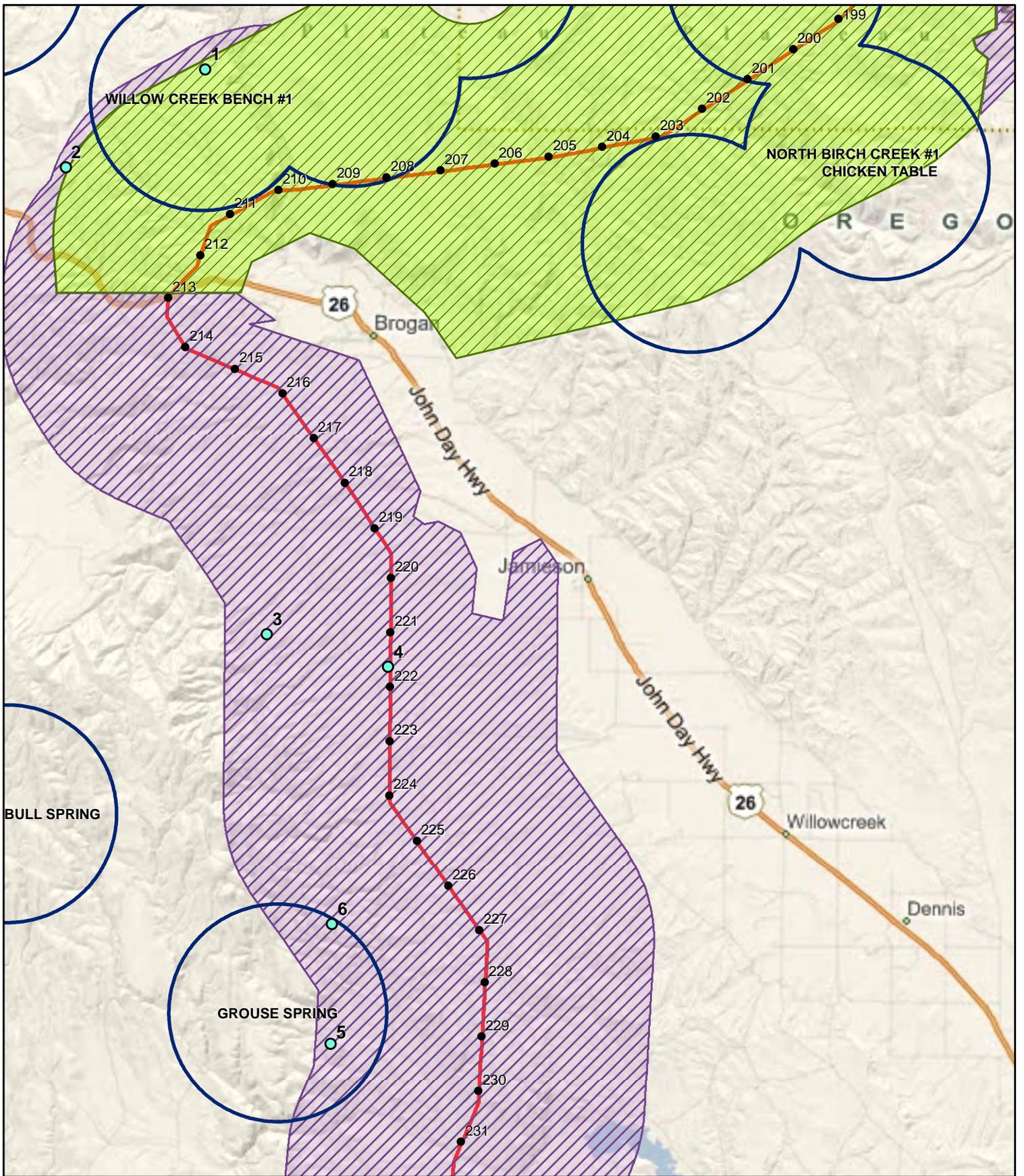
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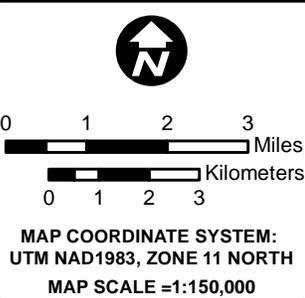
**BOARDMAN - HEMINGWAY 500kV  
 TRANSMISSION LINE PROJECT  
 OREGON - IDAHO**

**MAY 2011**



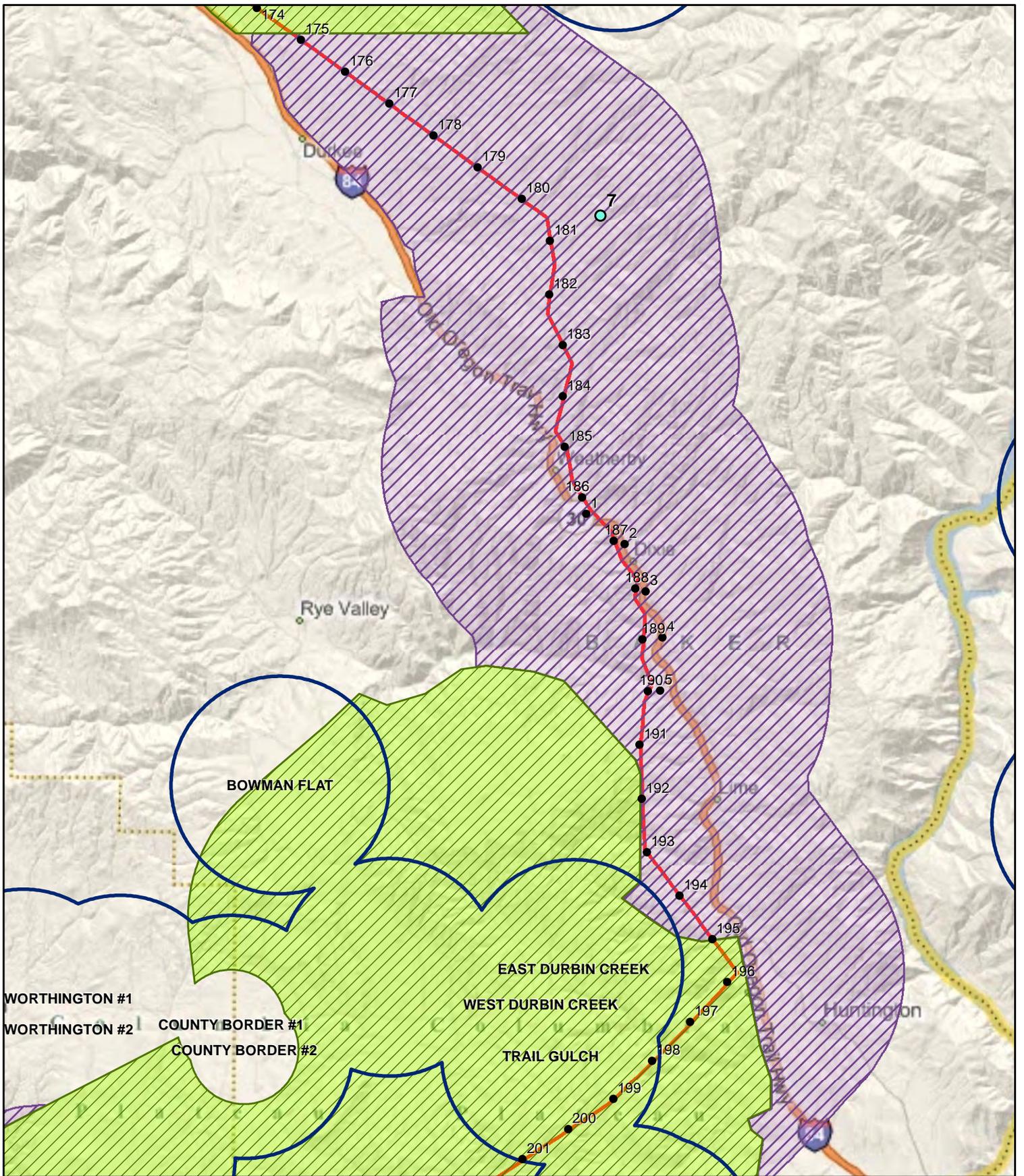
**FIGURE 3 - MARCH 22 & 23, 2011  
SAGE-GROUSE SURVEY RESULTS**

- 2011 Survey Area
- 2010 Survey Area
- 2-mile Lek Buffer
- Waypoint
- B2H Transmission Line - Proposed
- B2H Transmission Line - Alternative
- Milepost



**BOARDMAN - HEMINGWAY 500kV  
TRANSMISSION LINE PROJECT  
OREGON - IDAHO**

**MAY 2011**



**FIGURE 4 - MARCH 27 & 28, 2011 SAGE-GROUSE SURVEY RESULTS**

-  2011 Survey Area
-  2010 Survey Area
-  2-mile Lek Buffer
-  Waypoint
-  B2H Transmission Line - Proposed
-  B2H Transmission Line - Alternative
-  Milepost

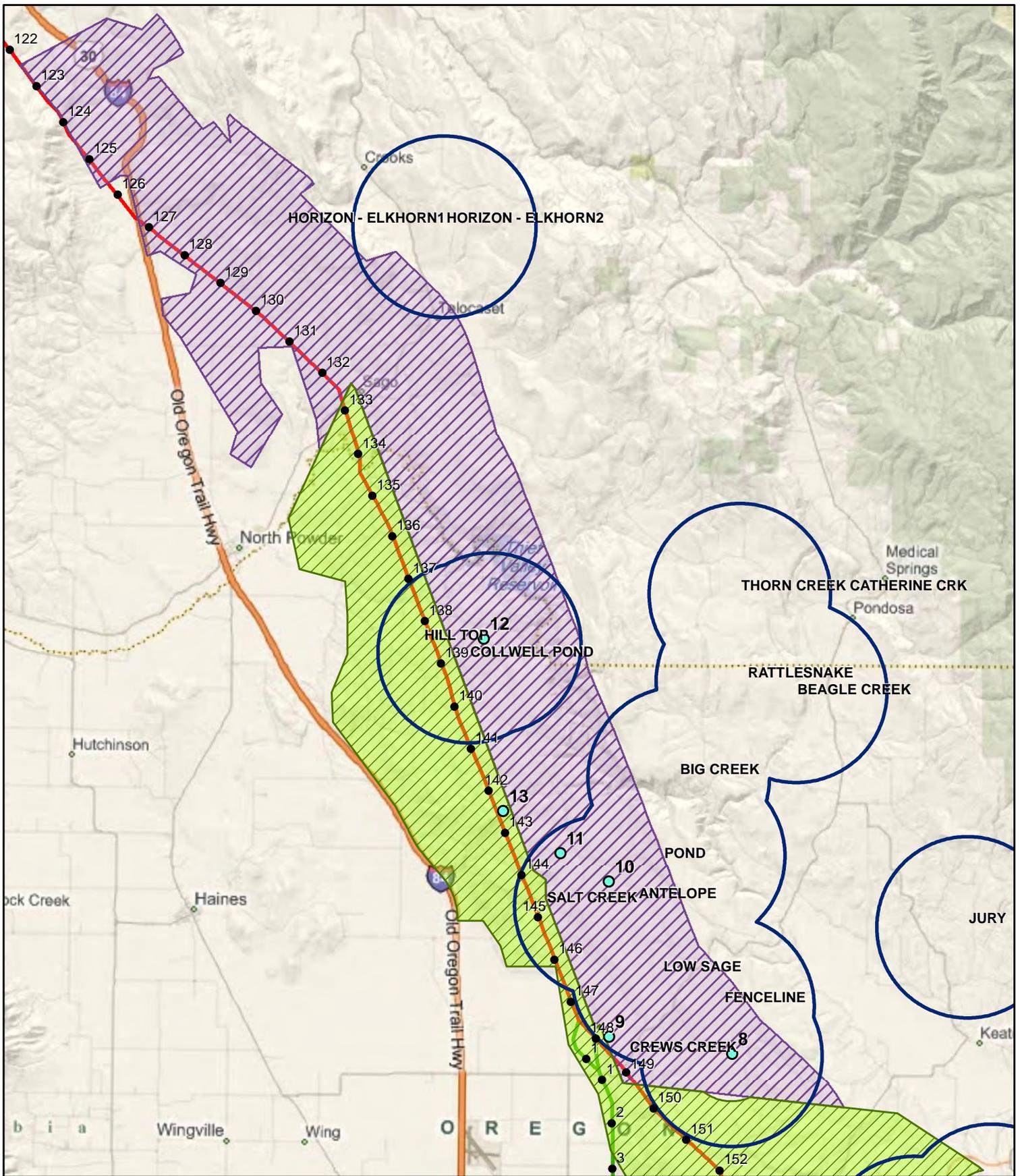

  

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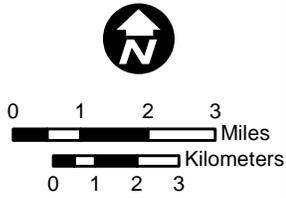


**BOARDMAN - HEMINGWAY 500kV  
 TRANSMISSION LINE PROJECT  
 OREGON - IDAHO**



**FIGURE 5 - MARCH 29 & 30, 2011 SAGE-GROUSE SURVEY RESULTS**

- 2011 Survey Area
- 2010 Survey Area
- 2-mile Lek Buffer
- Waypoint
- B2H Transmission Line - Proposed
- B2H Transmission Line - Alternative
- Milepost

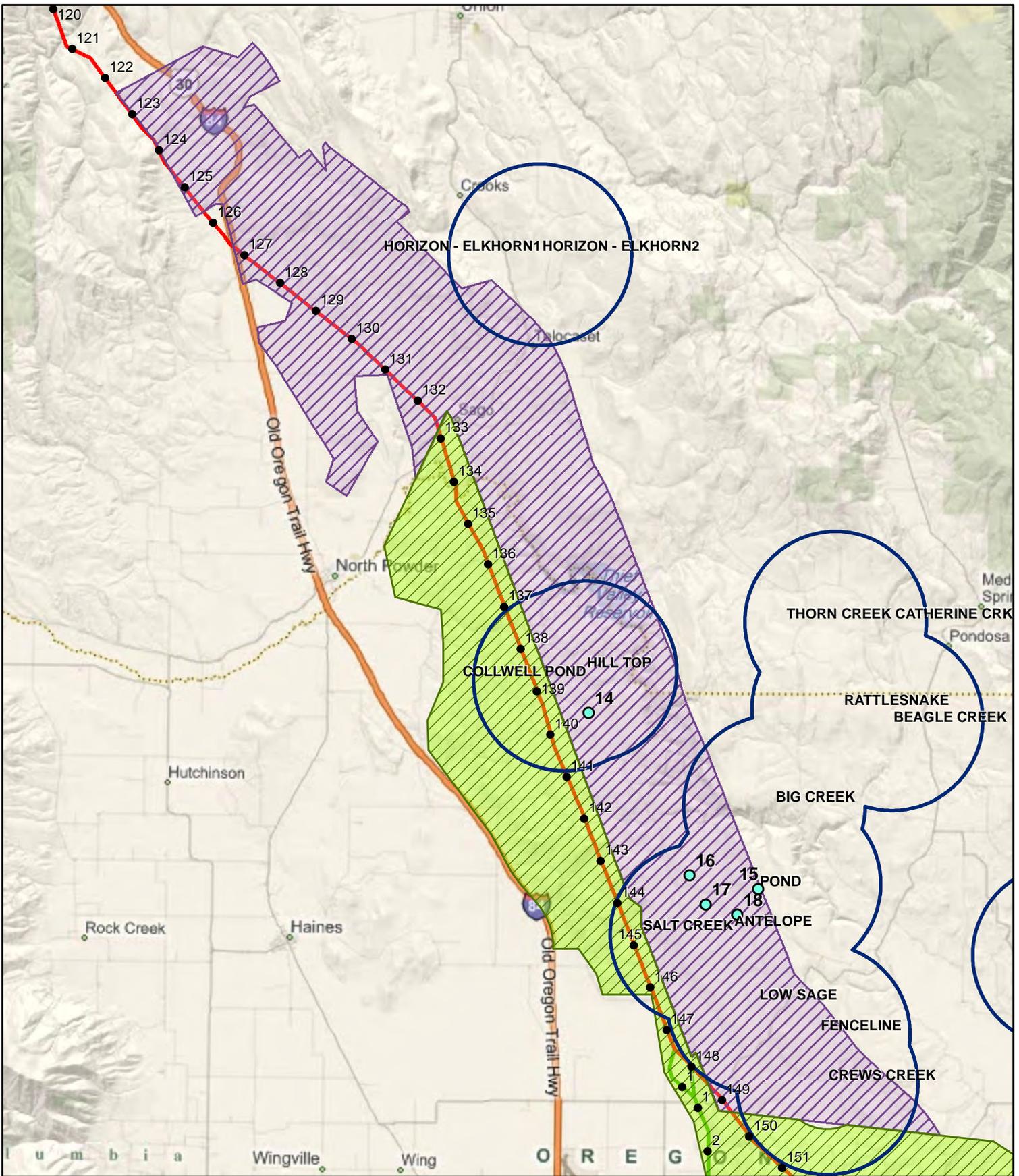


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MAP SCALE = 1:180,000



**BOARDMAN - HEMINGWAY 500kV TRANSMISSION LINE PROJECT OREGON - IDAHO**

MAY 2011



**FIGURE 6 - APRIL 18 & 19, 2011 SAGE-GROUSE SURVEY RESULTS**

-  2011 Survey Area
-  2010 Survey Area
-  2-mile Lek Buffer
-  Waypoint
-  B2H Transmission Line Proposed
-  Alternative
-  Milepost



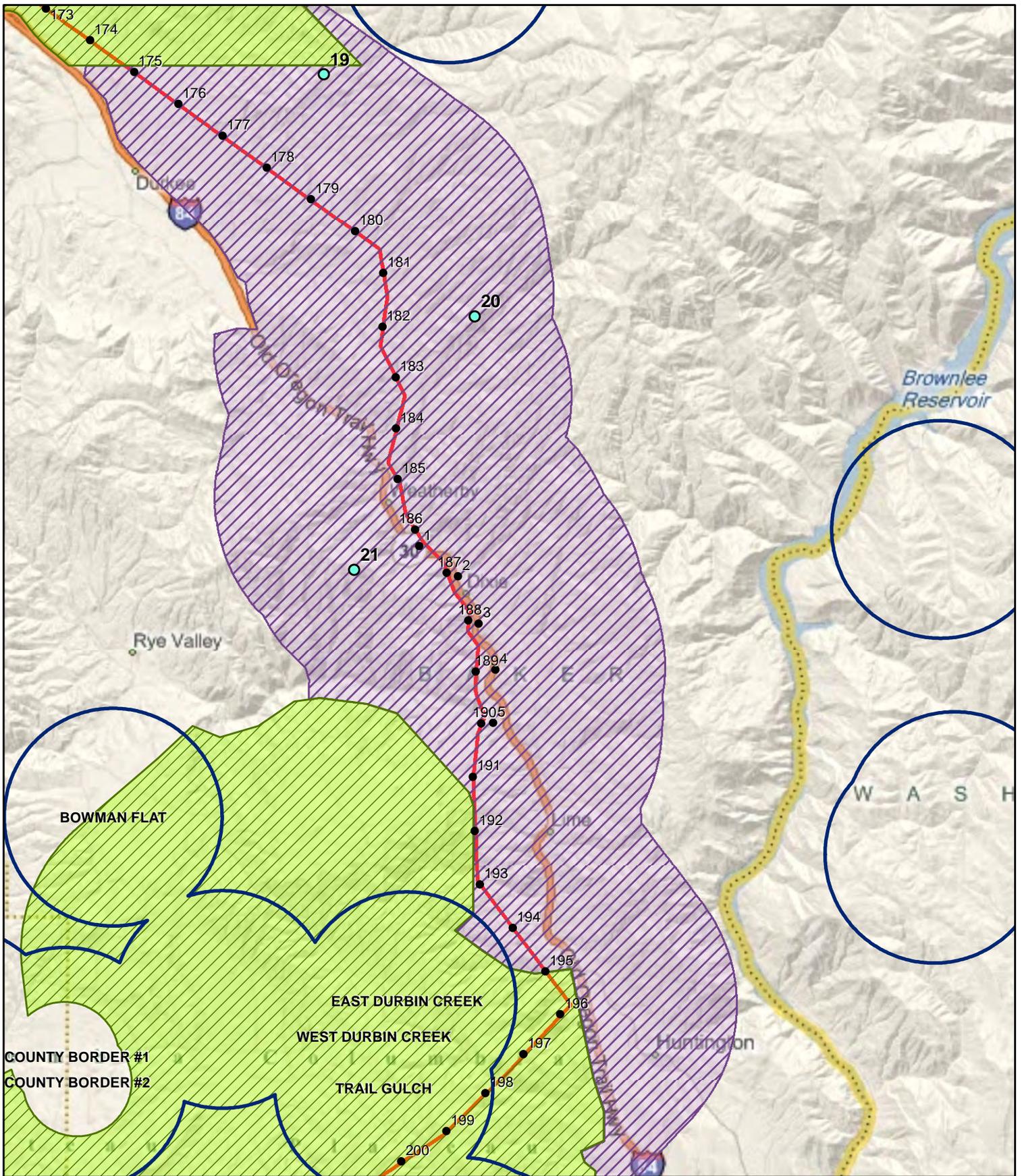
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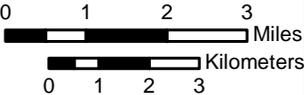
**BOARDMAN - HEMINGWAY 500kV TRANSMISSION LINE PROJECT**  
**OREGON - IDAHO**

MAY 2011



**FIGURE 7 - APRIL 20 & 22, 2011 SAGE-GROUSE SURVEY RESULTS**

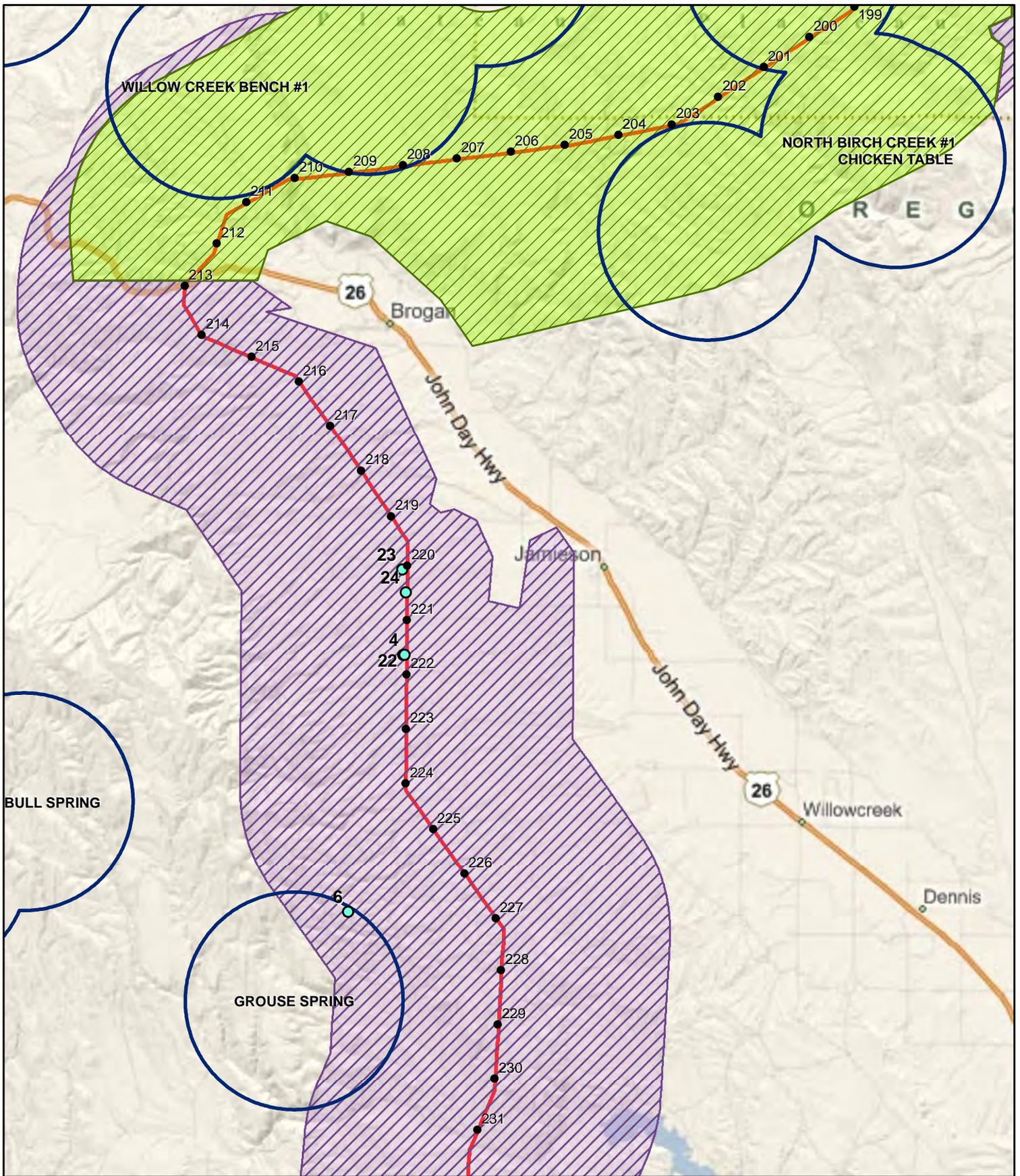
-  2011 Survey Area
-  2010 Survey Area
-  2-mile Lek Buffer
-  Waypoint
-  B2H Transmission Line - Proposed
-  B2H Transmission Line - Alternative
-  Milepost

**MAP COORDINATE SYSTEM:**  
 UTM NAD1983, ZONE 11 NORTH  
**MAP SCALE = 1:150,000**



**BOARDMAN - HEMINGWAY 500kV TRANSMISSION LINE PROJECT**  
**OREGON - IDAHO**



**FIGURE 8 - APRIL 23 & 24, 2011 SAGE-GROUSE SURVEY RESULTS**

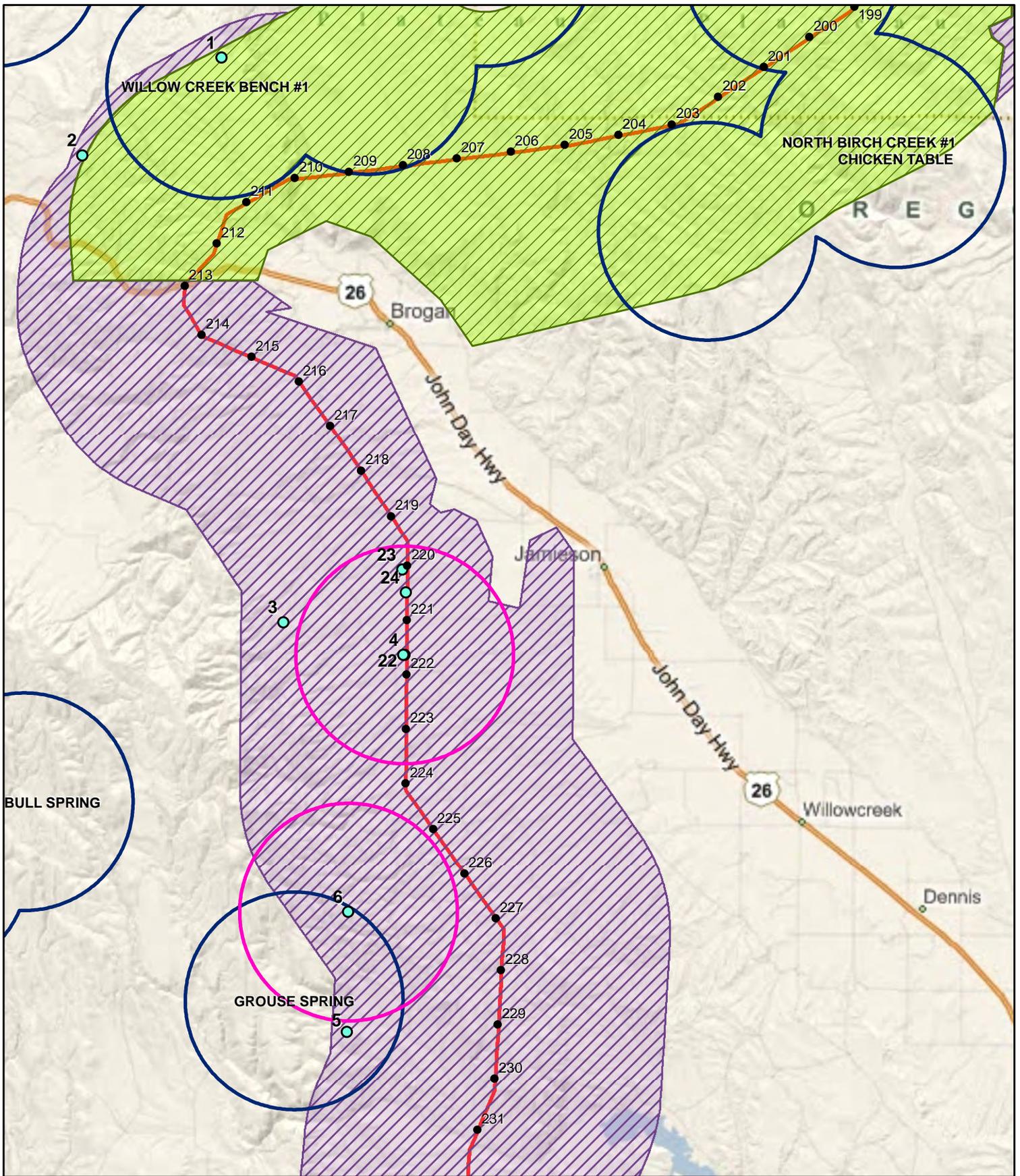
- 2011 Survey Area
- 2010 Survey Area
- 2-mile Lek Buffer
- Waypoint
- B2H Transmission Line Proposed
- B2H Transmission Line Alternative
- Milepost

MAP COORDINATE SYSTEM:  
 UTM NAD1983, ZONE 11 NORTH  
 MAP SCALE = 1:150,000



**BOARDMAN - HEMINGWAY 500kV TRANSMISSION LINE PROJECT OREGON - IDAHO**

**MAY 2011**



**FIGURE 9 - 2011 SAGE-GROUSE POTENTIAL OCCUPIED LEKS**

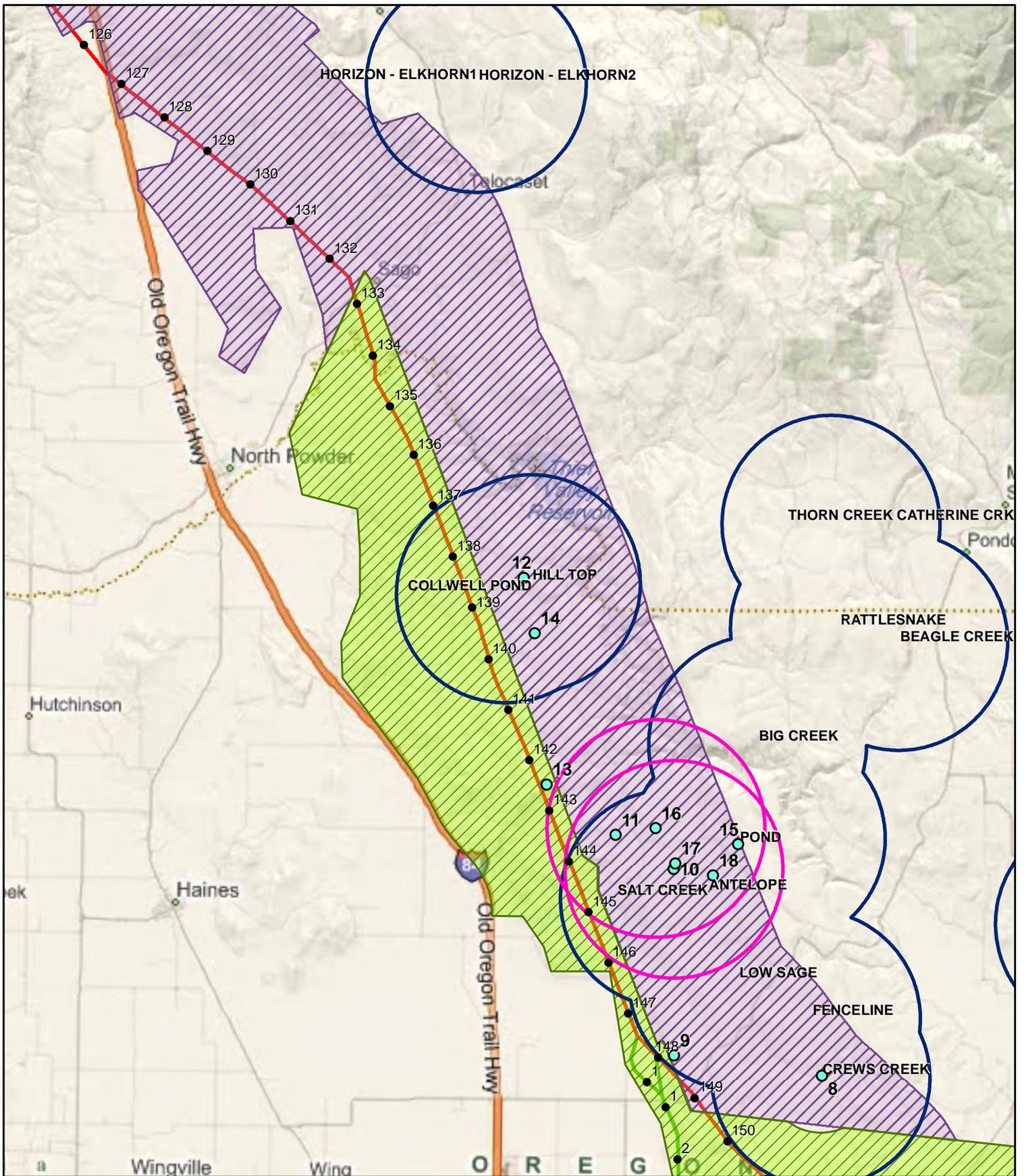
- 2011 Survey Area
- 2010 Survey Area
- 2-mile Lek Buffer
- Potential Occupied Lek 2-mile Buffer
- Waypoint
- B2H Transmission Line - Proposed
- B2H Transmission Line - Alternative
- Milepost

0 1 2 3 Miles  
 0 1 2 3 Kilometers  
**MAP COORDINATE SYSTEM:**  
 UTM NAD1983, ZONE 11 NORTH  
**MAP SCALE = 1:150,000**



**BOARDMAN - HEMINGWAY 500kV  
TRANSMISSION LINE PROJECT  
OREGON - IDAHO**

**MAY 2011**



**FIGURE 10 - 2011 SAGE-GROUSE POTENTIAL OCCUPIED LEKS**

-  2011 Survey Area
-  2010 Survey Area
-  2-mile Lek Buffer
-  Potential Occupied Lek 2-mile Buffer
-  Waypoint
-  B2H Transmission Line - Proposed
-  B2H Transmission Line - Alternative
-  Milepost



0 1 2 3 Miles  
0 1 2 3 Kilometers

**MAP COORDINATE SYSTEM:**  
UTM NAD1983, ZONE 11 NORTH  
**MAP SCALE = 1:150,000**



**BOARDMAN - HEMINGWAY 500kV TRANSMISSION LINE PROJECT**  
**OREGON - IDAHO**

**MAY 2011**

**APPENDIX A**  
**2011 SAGE-GROUSE SURVEY**  
**FLIGHT LOGS AND DATA SHEETS**

2011 Sage-grouse Field Datasheet Summary Table.

Date	Waypoint	GPS_ID	Obs_ID	Male	Female	Unkn	Total	NAD83_UTM_E	NAD83_UTM_N	Photo_ID	Comments
3/22/2011	1	444	1	0	0	0	0	453729	4907156	1	Known lek-birds strutting-did not count
3/22/2011	2	446	2	0	1	0	1	449613	4904259	2	1 female flushed
3/22/2011	3	448	3	0	0	1	1	455553	4890448	3	1 unkn flushed
3/22/2011	4	452	4	2	2	0	4	459132	4889488	4	4 flushed
3/23/2011	5	475	5	0	1	0	1	457433	4878331	8	1 female flushed
3/23/2011	6	484	6	3	1	0	4	457474	4881881	9	3 males strutting- all flushed.
3/24/2011	-	-	-	-	-	-	-	-	-	-	no sage grouse observed
3/25/2011	-	-	-	-	-	-	-	-	-	-	no sage grouse observed
3/26/2011	-	-	-	-	-	-	-	-	-	-	no sage grouse observed
3/27/2011	7	581	7	0	1	0	1	472056	4934788	11	Flushed a female - see photo for site
3/28/2011	4	452	4	4	0	0	4	459132	4889488	5	saw 2 males strutting and flushed 2 other males
3/28/2011	6	484	6	1	0	1	2	457474	4881881	10	flushed 2 birds
3/29/2011	8	668	8	2	0	1	3	445090	4968602	No Photo	Birds flushed – not enough light for photo
3/29/2011	9	669	9	0	1	0	1	440723	4969201	12	Bird flushed
3/29/2011	10	671	10	2	1	0	3	440712	4974712	13	Birds flushed
3/29/2011	11	673	11	0	2	0	2	438999	4975721	14	Birds flushed
3/30/2011	12	677	12	4	0	0	4	436286	4983326	15	Birds flushed
3/30/2011	13	716	13	1	0	0	1	436962	4977210	No Photo	Bird flushed
4/17/2011	-	-	-	-	-	-	-	-	-	-	Ferry from Pendleton to Baker City
4/18/2011	-	-	-	-	-	-	-	-	-	-	no sage grouse observed
4/19/2011	14	3	14	0	1	0	1	436609	4981690	16	Bird flushed
4/19/2011	15	4	15	1	0	0	1	442620	4975445	17	Bird flushed
4/19/2011	16	5	16	11	0	0	11	440182	4975921	18	2-3 strutting, rest flushed, did not see any females
4/19/2011	17	6	17	3	0	0	3	440758	4974881	19	1 strutting, 2 flushed
4/19/2011	18	7	18	1	1	0	2	441871	4974526	20	birds flushed, the male 1st
4/20/2011	19	8	19	0	1	0	1	468815	4939920	21	Bird flushed
4/20/2011	20	10	20	0	1	0	1	473272	4932754	22	Bird flushed
4/20/2011	21	11	21	0	1	0	1	469709	4925260	23	Bird flushed
4/21/2011	-	-	-	-	-	-	-	-	-	-	No Flights
4/22/2011	-	-	-	-	-	-	-	-	-	-	No sage grouse observed – ferry BC to Ontario=.8 hr
4/23/2011	22	451	22	0	1	0	1	459100	4889486	No Photo	flushed 1 female – 0836 hrs near original wp451
4/23/2011	23	454	23	0	1	0	1	459069	4892004	No Photo	flushed 1 female – 0843 hrs near original wp454
4/23/2011	24	18	24	6	0	0	6	459174	4891334	24	flushed 6 male sage grouse-did not see strutting-0844 hrs
4/23/2011	4	452	4	5	0	5	10	459132	4889488	6	flushed 10 birds, 5 males, 5 unid, no strutting, 0848 hrs
4/24/2011	4	452	4	1	2	7	10	459132	4889488	7	Several males strutting in pasture east of wp452, 10+ birds flushed
4/24/2011	6	484	6	0	0	3	3	457474	4881881	No Photo	flushed 3 birds from wp484 site

# DAILY FLIGHT LOG

Date: 3-22-11

Page 1 of 2

Time Flight Started: 0736 Time Survey Started: 0800  
 Time Survey Ended: 1018 Time Flight Ended: 1034  
 Total Flight Hours: 2.9

Observer: Mike Schlogel  
Matt Cambick

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
 Wind (MPH): 0-4; 5-10; 11-15; > 15;  
 % Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 29 End: 36  
 Start: 0-4 End: 0-4  
 Start: 5-25 End: 5-25

Area Surveyed: Begun in Map 7

Survey Time = 3.6  
 Ferry Time = 1.2  
4.8 Day Total

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

31  
Did not record  
Did not record

Antelope - Did not record

Sage Grouse Observed: Number  
 (non-lek)

UTM's (WGS83)

WP 444 - 1 known lek will check sex# on 3-23-11 → 11T 0453729 / 4907156  
 WP 446 - 1 ♀ S.G. Flush → 11T 0449613 / 4904259  
 WP 448 - 1 unkn - Flush → 11T 0455553 / 4890448  
 WP 452 - 2 ♂, 2 ♀ - Flush → 11T 0459132 / 4889488

Miscellaneous Wildlife Observations:

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 3-22-11 Observer: Mike Schlegel / Matt Combs  
County/Mgmt Unit: map 7

Time Flying Started: 0736 Time Survey Started: 0800

Time Survey Ended: 1018 Time Flight Ended: 1034

Lek Name UNK

Time 0822

UTM Coord. WQ 446 - 11T 0449613 / 4904259

Sky Conditions light cloud - clear - 0-25% cloud

Ground Conditions Sage/Sage - see photo #7812 - matt

Males \_\_\_\_\_

Females 1 - Flush

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest road 1/2 mi E - see GIS - Google Earth

Description of General Location Extensive sage flat  
see GIS - Google Earth

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 3-28-11 Observer: Mike Schlegel / Matt Lambert County/Mgmt Unit: Map 7 area

Time Flying Started: 0736 Time Survey Started: 0800

Time Survey Ended: 1018 Time Flight Ended: 1039

Lek Name WP448 11T045553/4690445

Time 0924  
UTM Coord. WP448 011T 045553/4690445

Sky Conditions clear

Ground Conditions grass/scrub

Males \_\_\_\_\_

Females \_\_\_\_\_

Unclassified 1 - Flush - coyote flushed bird

Total Birds 1

Directions to closest road 1/2 mi east

Description of General Location See Photo # 7813 - Matt  
N Face slope



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 3-25-11 Observer: Mike Schlegel County/Mgmt Unit: Windfall Cambier

Time Flying Started: 0736 Time Survey Started: 0800

Time Survey Ended: 1018 Time Flight Ended: 1039

Lek Name WP 452 0 11T 0459132 / 4889488

Time 0955 W 4583

UTM Coord. WP 452 0 11T 0459132 / 4889488

Sky Conditions Clear

Ground Conditions See Photo #7851 - mott

Males 2

Females 2

Unclassified

Total Birds 4 - Flushed

Directions to closest road

Description of General Location See photo - Mott # 7851

# DAILY FLIGHT LOG

0749 - Sunrise

Date: 3-23-11

Time Flight Started: 0714  
Time Survey Ended: 1000

Time Survey Started: 0730  
Time Flight Ended: 1018  
Total Flight Hours: 3.1

Observer: Mike Schlegel & Matt Combs

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 28 End: 32  
Start: 10-4 End: 0-4  
Start: 5-25 End: -75 - High overcast

Area Surveyed: map 8

wp's 474 → 489

Coyotes Observed: \_\_\_\_\_

Elk Observed: Very Few Elk

Deer Observed: several deer & Antelope groups

MAP = 5

Sage Grouse Observed: Number (non-lek)

wp 475 - Flush ♀ SG - (7993) - 11T 0457433/4878331  
wp 484 - 1 ♀ - 307 (strutting) - (8067) - 11T 0457474/4881881

wp 488 - GE - 3 Nests - 1 Bird (8093) - 11T 0460697/4872521  
wp 489 - Nest w/ Bird on nest (8096) - 11T 0460527/4872223

End Sunny { wp 489

## Miscellaneous Wildlife Observations:

- 474 - owl - open grass - Black wing tips - large blue burrowing
- 476 - GE - In Flight - (7998) - 11T 0457408/4879206
- wp 477 - vireo hawk - (8022) - 11T 0462720/4882863
- wp 478 - Nest - Raven (8029 - Bird) - 11T 0461781/4884186
- wp 479 - Hawk - (F) (8038 - In Flight) - 11T 0462514/4880658
- wp 480 - 5 Burrowing owls - in wash area gully (8050)
- wp 481 - vireo hawk - (8054) - 11T 0460696/4881288

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

- wp 482 - vireo hawk (8062) ← 11T 0460409/4882997
- wp 483 - Nest w/ 2 birds (8065) Red tail - 11T 0459743/4880778
- wp 485 - 4 Nests - 1 w/ Bird on nest (8081) - 11T 0457990/4875999
- wp 486 - Nest w/ falcon - 1 Bird (8090) - 11T 0461881/4872592
- wp 487 - Delite



**SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM**

Date: 3-23-11 Observer: <sup>Mike Schlegel</sup> Matt Lomberg County/Mgmt Unit: Maps 849

Time Flying Started: 0714 Time Survey Started: 0730

Time Survey Ended: 1000 Time Flight Ended: 1016

Lek Name WP.475

Time 0758

UTM Coord. 11T 0457433 / 4875331

Sky Conditions 5-25% cloud cover - High - Light

Ground Conditions See Photo # 7993

Males \_\_\_\_\_

Females 1 - Flushed

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest ± 100 yds W

road \_\_\_\_\_

Description of General Location See photo 7993

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 3-23-11 Observer: <sup>Mike Schlegel</sup> Matt Cambria County/Mgmt Unit: MAPS 849

Time Flying Started: 0714 Time Survey Started: 0730

Time Survey Ended: 1000 Time Flight Ended: 1016

Lek Name wp 484

Time 0932

UTM Coord. 11T0457474/4881881

Sky Conditions overcast - thin cloud cover

Ground Conditions see photos

Males 3 - 1 strutting

Females 1

Unclassified \_\_\_\_\_

Total Birds 4

Directions to closest road at site

Description of General Location see photos 1067

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

MOT

# DAILY FLIGHT LOG

SUN RISE - 0746

Date: 3-24-11-1

Time Flight Started: 0735 Time Survey Started: 0750  
Time Survey Ended: 0938 Time Flight Ended: 0958  
Total Flight Hours: (2.4)

Observer: Mike Schlegel  
Matt Cambick

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 30:39 End: > 40  
Start: 0-4 End: 5-10  
Start: > 75 End: > 75

Area Surveyed: West + So of Vale - 30  
original area Fagged in off Mathew River

Rained during night

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

||||| (9)

Sage Grouse Observed: Number  
(non-lek) No Sage Grouse

UTM's

## Miscellaneous Wildlife Observations:

- 490 - Hairier + owl - (short eared?) of wings
- 491 - Large owl - (8118) - dimmed surface light at Elbow joint  
very light color 11T0481527/4846271
- 492 - Nest - Raven (8126) - 11T0485279/4845717
- 493 - owl - Flew off cliff over (8130) 11T0486159/4846164
- 494 - Nest - (8133) - Red Tail in area - 11T0486477/4846286
- 495 - 2 Nest in tree - common wood (8135) 11T0484513/4846233
- 496 - 2 Nest - cliff area - Barn owl in area (8141) 11T0485214/4845621

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

497 - GE - Nest in cliff (8142) 11T0483846/4844868

498 - GE - 11T0481753/4842362

499 - Red tail - in flight - No Photo - 11T0491421/4833526  
11T0492460/4833016

500 - 2 Nests - Red tail in area - No Photo

501 - Sharp or Cooper - in flight - No Photo - Bald tail

11T0493139  
4832845

1215

SUNRISE - 0743

# DAILY FLIGHT LOG

Date: 3-25-11  
 Observer: Milze Schlegel  
Matt Cambier  
 Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
 Wind (MPH): 0-4; 5-10; 11-15; > 15;  
 % Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;  
 Area Surveyed: So. Caldwell

Time Flight Started: 0716 Time Survey Started: 0741  
 Time Survey Ended: 0901 Time Flight Ended: 0950  
0932 Total Flight Hours: 2.4 2.7 after 3-24-11  
 Start: 30-39 End: > 40  
 Start: 0-4 End: > 15  
 Start: 51-75 End: 51-75

Coyotes Observed: \_\_\_\_\_  
 Elk Observed: \_\_\_\_\_  
 Deer Observed: \_\_\_\_\_

111 (3)

Sage Grouse Observed: \_\_\_\_\_ Number \_\_\_\_\_ UTM's \_\_\_\_\_  
 (non-lek)

### Miscellaneous Wildlife Observations:

(\*) Stopped Sage Grouse Survey. High Winds - 10-20  
 some areas 5-10  
 Begin Raptor nest survey

- 539. Nest (2) Falcon flying in area. (8264) 11T0499331/4820149
- 540. Nest (8267) - 11T0499157/4819801
- 541. Nest w/ Bird on nest (8273) GE = Falcon chasing (2 in area) 11T0498663/4819438
- 542. " → 8279 - 11T0498553/4819281 GE in AIR

Fuel Truck Miles: \_\_\_\_\_ Fuel Truck Driver Hours: \_\_\_\_\_

543 - Falcon flew off cliff - Barn owl in same area  
 11T0498910/4819304  
 ↳ photo 8281

# DAILY FLIGHT LOG SUNRISE 0740

Date: 3-26-11

Observer: Mike Schlegel  
Matt Cambiek

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Time Flight Started: 0721 Time Survey Started: 0935  
Time Survey Ended: 0836 Time Flight Ended: 0838  
Total Flight Hours: 1.053  
Start: 30-39 End: > 40  
Start: 0-4 End: 5-10  
Start: > 75 End: > 75

Area Surveyed: \_\_\_\_\_

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed: Number  
(non-lek) No Sage Grouse observed

UTM's

- 550 - Falcon Flew off rocks - 2 Nests (8369) - 11T0522456 / 4801310
- 551 - Nest - Rocks (8366) - 11T0522693 / 4801720
- 552 - Nest w/ Red Tail on nest (8373) - 11T0522635 / 4803106
- 553 - Prairie Falcon - 8377 - 11T0522537 / 4803591
- 554 - owl - small - Flew off rocks - 1 Nest - 8388 - dorsal surface wings - elbow joint - w/col spec
- 555 - GE Lark in nest - 8393 - 11T0522792 / 4803354

**Miscellaneous Wildlife Observations:**

- 549 - 12 BH - 1 C2 w/ collar  
4 Lambs  
7 ♀ - 3 w/ collar  
556 - Nest (bis) 8395 - 11T0525154 / 4795695
- 557 - Nest - 8397 - 11T0520176 / 4802828
- 558 - Nest - 8402 - 11T0521003 / 4804650

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

# DAILY FLIGHT LOG

SUNRISE - 0643 PDT

Date: 3-27-11-1

Time Flight Started: 0622 Time Survey Started: 0635/0900

Observer: Mike Schlegel  
Matt Cambien

Time Survey Ended: 0900 Time Flight Ended: 0828  
0923 Total Flight Hours: (3.1)

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 20-29 End: > 40  
Start: 5-10 End: 5-10 Day Total = 6.3  
Start: 51-75 End: 51-75

Area Surveyed: Flew south - began working north 6.3

Coyotes Observed:

Elk Observed: 1 group 50-75 - 15 - mostly ♂ + ♀

Deer Observed: lots - a good number

Sage Grouse Observed: Number  
(non-lek)

UTM's

581 - Flushed 1 ♀ SG - 0712 - snow cover / sage  
11T 0472056/4934788

photo  
8511

## Miscellaneous Wildlife Observations:

1 mtn Liar - matt - photo's

582 - Hawk in flight 2540 - 11T 0471240/4928875

583 - Red tail in Juniper - No photo 11T 0467928/4929744

584 - Hawk on Rock ridge Red-tail (8554) 11T 0474529/4921935

585 - Golden E - on Rock pt 8564 - 11T 0474457/4921391

586 - " " on nest 8570 - 11T 0474434/4921010

587 - Falcon - unid - No Photo - 3 Black strips on tail 11T 0472456/4921025

588 - Harrier - No Photo - 11T 0471794/4919765

Fuel Truck Miles: \_\_\_\_\_ Fuel Truck Driver Hours: \_\_\_\_\_

589 - Falcon - Dandel tail - 8585 - 11T 0475859/4919950

590 - Harrier - No photo - 11T 0473406/4918590

591 - GE - Flew from juniper - 11T 0476966/4919026

592 - Nest in Rocks 8591 - 11T 0476758/4918950

# DAILY FLIGHT LOG

Sunrise 0641 <sup>END</sup>

Date: 3-28-11

Time Flight Started: 0607  
Time Survey Ended: \_\_\_\_\_

Time Survey Started: 0630 (0649)  
Time Flight Ended: 0715 (2903)  
Total Flight Hours: 0903-0933

Observer: Mike Schlegel  
Matt Cambien

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 30-39 End: >40  
Start: 0-4 End: 0-4  
Start: 51-75 End: 26-50

3.8 hr

Area Surveyed: Sunrise Hunting area 1st - Fog - continue  
E-W Vale

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

~~HT1~~ HT1 = 26 + 2 = 28  
2

Sage Grouse Observed: Number  
(non-lek)

UTM's

452- Recheck - Saw 2 ♂ flushing - 280 - (1 flushed)  
2 Flush - ♂ 0703 PDT - 8819  
484- Recheck - Saw 2 BIRDS - 2712 PDT

## Miscellaneous Wildlife Observations:

- 6 Red tail - hinder 1 on nest - up did not enter
- 638- Ferrug- ♂ - on sage - Found Nest (small) 8854-11T0461512  
4870442
- 639- 2 GE- 1 on nest / 1 on Rock - 2 nests 8862-11T0464748  
4862896
- 640- Nest on Rock Face - 8863-11T0464580/4862570
- 641- Nest in Rocks - Raven on nest 8865-11T0462103/4864338
- 642- Nest - Barn owl Flushing 8866-11T0462204/4864309
- 643- Unid Fulmar in Flight (Prairie) 8872-11T0462333/4864166

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

DAILY FLIGHT LOG

sunrise - 0639

Date: 3-29-11

Time Flight Started: 0625 Time Survey Started: 0625

Time Survey Ended: 0817 Time Flight Ended: 0825

Observer: Mike Schloep  
Matt Camblak

Total Flight Hours: 2.0

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;

Start: 30-39 End: 30-39

Wind (MPH): 0-4; 5-10; 11-15; > 15;

Start: 0-4 End: 0-4 - 5-10 in part

% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: > 75 End: > 75 of being seen

Area Surveyed:

E Baker City - north of Interp. center  
SAGE GROUSE  
0726

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed: Number

UTM's

(non-lek) 668 - 11T 0445090/4968602

669 11T 0440723/4969201

671 11T 0440765/4974712

673 11T 0438999/4975721

End survey cup 674

Miscellaneous Wildlife Observations:

670 - Ruffin in flight - NO photo

672 - GE Nest - 9033, Power Pole - Marlene

11T 0438471/4974836  
Died on nest

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_



# SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 3-29-11 Observer: Mike Schlegel & Matt Cambier  
County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0625 Time Survey Started: 0628

Time Survey Ended: 0817 Time Flight Ended: 0825 = 2.0 hr  
*1.125 hr*

Lek Name \_\_\_\_\_

Time 0640

UTM Coord. WP 668 - 11T 0445090 / 4968602

Sky Conditions 100% cloud cover

Ground Conditions Bear

Males	<u>2</u>
Females	<u>0</u>
Unclassified	<u>1</u>
Total Birds	<u>3</u>

Directions to closest road 1/4-1/2 mi E

Description of General Location sup. brush Matt - Photos No Photo light see



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 3-29-11 Observer: Mike Schlegel Matt Cambien  
County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0625 Time Survey Started: 0629

Time Survey Ended: 0817 Time Flight Ended: 0825

Lek Name \_\_\_\_\_

Time 0648

UTM Coord. WP669 11T 0440723 / 4969201

Sky Conditions 100 overcast

Ground Conditions \_\_\_\_\_

Males \_\_\_\_\_

Females 1

Unclassified \_\_\_\_\_

Total Birds 1 Flushed

Directions to closest \_\_\_\_\_

road 1/2 mi S-SE

Description of General Location 9020 Photo

\_\_\_\_\_

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# SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 3-29-11 Observer: Mike Schlegel Matt Cambrek County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0625 Time Survey Started: 0628

Time Survey Ended: 0817 Time Flight Ended: 0825

Lek Name \_\_\_\_\_

Time 0738

UTM Coord. 49671 11T 0440712/4974712

Sky Conditions 100% Clear

Ground Conditions "iscape" - see photo  
Low sage / Rock

Males 2

Females 1

Unclassified \_\_\_\_\_

Total Birds 3 - Flush

Directions to closest road ± 1/4 mi W

Description of General Location 9022 - Photo

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM**

Date: 3-29-11 Observer: Mike Schlegel Matt Lombier County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0625 Time Survey Started: 0628

Time Survey Ended: 0817 Time Flight Ended: 0825

Lek Name \_\_\_\_\_

Time 0744

UTM Coord. WP 673 11T 0438 999 / 4975 721

Sky Conditions 100 cloud cover

Ground Conditions Scrub

Males \_\_\_\_\_

Females 2

Unclassified \_\_\_\_\_

Total Birds 2 Flush

Directions to closest road 1/2 mi E

Description of General Location 9036 Photo

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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# DAILY FLIGHT LOG

SUNRISE - 0637 PDT

Date: 3-30-11

Time Flight Started: 0625  
Time Survey Ended: \_\_\_\_\_

Time Survey Started: 0630 (0853)  
Time Flight Ended: 0853-1015  
Total Flight Hours: 3 10 19

Observer: Mike Schlegel  
Matt Cambria

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 20-39 End: > 40  
Start: 0-4 End: 0-4  
Start: > 75 End: 75

3.9 hrs

Fog in valley. Rain during night  
Begin at up 675

Area Surveyed: \_\_\_\_\_

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed: \_\_\_\_\_  
(non-lek)

UTM's

677 - see data sheet - 11T0436286/4983326

## Miscellaneous Wildlife Observations:

676: "IT" in Flight - 11T0435417/4982253

678 " " " " - 11T0435015/4985066

679 - GE - Flushed from Tree on Shore Lane - 11T0435740/4986788

680 - Golden Plover - 2 nests on Rock Face - 11T0436095/4986243

681 - 2 Barn Swallows - in Flight - Rock Face - 11T0435617/4987247

682: Nest - 9048 - Rock Face - 11T0435743/4987172

683 - Nest - Tree - 9049 - River - 11T0433849/4988814

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

684 - Nest - Tree - along River 9058 11T0433050/4989943

685 - 2 Kestrels - 10219 - LB - Flushed from Tree  
11T0432530/4990809



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 3-30-11 Observer: \_\_\_\_\_ County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: \_\_\_\_\_ Time Survey Started: \_\_\_\_\_

Time Survey Ended: \_\_\_\_\_ Time Flight Ended: \_\_\_\_\_

Lek Name \_\_\_\_\_

Time 0650

UTM Coord. WP 677 11T0436286/4983326

Sky Conditions 100% - Cloud

Ground Conditions See Photo - Bare 9038

Males 4

Females \_\_\_\_\_

Unclassified \_\_\_\_\_

Total Birds 4

Directions to closest road 1/4 mi N

Description of General Location 9038 - Photo

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 3-30-11 Observer: <sup>Mike Schlegel</sup> Matt Cambra County/Mgmt Unit: Baker Co

Time Flying Started: 1255 Time Survey Started: 1300

Time Survey Ended: 1532 Time Flight Ended: 1542

Lek Name WP716

Time \_\_\_\_\_

UTM Coord. 11T0436962/4977210

Sky Conditions > 75% Cloud cover

Ground Conditions See Photo 9251

Males 1 - Flushed

Females \_\_\_\_\_

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest road ± 100 yds - West - Power Line Road

Description of General Location See Photo 9251

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# DAILY FLIGHT LOG

SUNNILE 0637

Date: 3-31-11

Time Flight Started: 0629

Time Survey Started: 0645-0732

Observer: Mike Schlegel  
Matt Compton

Time Survey Ended: 0735 → 0803

Time Flight Ended: 0705-0755

Total Flight Hours: 1.7

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;

Start: > 40 End: > 40

Wind (MPH): 0-4; 5-10; 11-15; > 15;

Start: 0-5 End: 0-5

% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: > 75 End: > 75

Area Surveyed: N 4 E of Baker City - Finch Sage Grouse

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

12

Sage Grouse Observed: \_\_\_\_\_  
(non-lek)

UTM's

## Miscellaneous Wildlife Observations:

- 023 - 9483 - Nest in Aspen
- 024 - Hd BE in Tree 9493
- 025 - Nest in dead E. Fir 9495

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

SUNRISE 0602  
NAD 83

# DAILY FLIGHT LOG

Date: 4-18-11

Observer: Mike Schlegel  
Matt Cambria

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;

Wind (MPH): 0-4; 5-10; 11-15; > 15;

% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Time Flight Started: 0533 Time Survey Started: 0544  
Time Survey Ended: 0754 Time Flight Ended: 0801  
Total Flight Hours: 2.5

Start: 30-29 End: 30-39 (31)  
Start: 0-4 End: -7 AT Air Port - 10/15 in  
Start: 51-75 End: -26-50 Survey  
check

Area Surveyed: N, Baker City - SAGE GROUSE ONLY

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

~~XXXXXXXXXX~~ = (21)

Sage Grouse Observed: \_\_\_\_\_ Number  
(non-lek)

UTM's

No Sage Grouse

Winds 10-15 Last 20-30 min of survey - near Reservoir - Radio check - 7 mph at Airport

### Miscellaneous Wildlife Observations:

001 - Gwinny owl - 11T 0427834 / 4991456 - In Flight  
002 - " " - 11T 0427546 / 4991962 - In Flight

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_





SAIGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 4-19-11 Observer: <sup>Mike Schlegel</sup> Matt Cambren County/Mgmt Unit: Baker Co

Time Flying Started: 0542 Time Survey Started: 0549

Time Survey Ended: 0811 Time Flight Ended: 0817

SUNRISE - 0601

Lek Name: WP003

Time: 0552

UTM Coord.: 11T0436609 / 4981690

Sky Conditions: Clear

Ground Conditions: See Photo 263

Males: \_\_\_\_\_

Females: 1 - Flushed

Unclassified: \_\_\_\_\_

Total Birds: 1

Directions to closest road: ± 1/2 mi North

Description of General Location: Elevation is ± 3736  
See Photo 263

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 4-19-11 Observer: Mike Schlegel / Matt Campbell County/Mgmt Unit: Baker Co

Time Flying Started: 0542 Time Survey Started: 0549

Time Survey Ended: 0811 Time Flight Ended: 0817

Sun Rise - 0601

Lek Name WP004

Time 0607

UTM Coord. 11T 0442620 / 4975445

Sky Conditions Clear

Ground Conditions See Photo 272

Males 1 - Flushed

Females \_\_\_\_\_

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest WP near Stock Pond and there is  
road a road to the pond

Description of General Location Elevation ± 3453

SEE Photo 272



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 4-19-11 Observer: <sup>Mike Schlegel</sup> Matt Cambria County/Mgmt Unit: Baker Co

Time Flying Started: 0542 Time Survey Started: 0549

Time Survey Ended: 0811 Time Flight Ended: 0817

Sun Rise - 0601

Lek Name WP005

Time 0633

UTM Coord. 11T 0440182 / 49 75 921

Sky Conditions Clear

Ground Conditions See Photo 303

Males 11 - some strutting - 2/3 - Rest flushed

Females \_\_\_\_\_

Unclassified \_\_\_\_\_

Total Birds 11

Directions to closest road 1/4 mi South - windmill + round metal Tank -

Description of General Location Elev  $\pm$  3801

See Photo 303



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 4-19-11 Observer: Mike Schlegel / Matt Cambria County/Mgmt Unit: Baker Co

Time Flying Started: 0542 Time Survey Started: 0544

Time Survey Ended: 0811 Time Flight Ended: 0817

Sun Rise - 0601

Lek Name WP006

Time 0638

UTM Coord. 11T 0440758 / 4974881

Sky Conditions Clear

Ground Conditions See Photo 306

Males 3 - 1 strutting, 2 flushed

Females \_\_\_\_\_

Unclassified \_\_\_\_\_

Total Birds 3

Directions to closest road ± 200/400 yds South of Windmill and Round metal tank

Description of General Location Elevation ± 3672

See Photo 306



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 4-19-11 Observer: Mike Schlegel  
Matt Cambien County/Mgmt Unit: Baker Co

Time Flying Started: 0542 Time Survey Started: 0549

Time Survey Ended: 0811 Time Flight Ended: 0817

SUNRISE - 0601

Lek Name WP007

Time 0754

UTM Coord. 11T 0441671 / 4974526

Sky Conditions Clear

Ground Conditions See Photo 334

Males 1 - Flushed 1st

Females 1 - Flushed 2nd

Unclassified \_\_\_\_\_

Total Birds 2

Directions to closest road 1/4 mile SW - road to Stock Pond

Description of General Location Elevation  $\pm$  3585  
See Photo 334

1/4 mile NE of historic Lek

San Res 0600

# DAILY FLIGHT LOG

Date: 4-20-2011  
Observer: Mike Schlegel  
Matt Cambien

Time Flight Started: 0533 Time Survey Started: 0550  
Time Survey Ended: 0801 Time Flight Ended: 0819  
Total Flight Hours: 2.8

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 20-29 End: 30-39  
Start: 0-4 End: 0-4  
Start: 775 End: 775

Area Surveyed: South Baker City, to Huntington → Thin -

Coyotes Observed: \_\_\_\_\_  
Elk Observed: \_\_\_\_\_  
Deer Observed: \_\_\_\_\_

III = (3)

Sage Grouse Observed:	Number	UTM's
WP008 - 0533 - Flashed ♀ SG - Ridge Line/Knob - Photo	336	
WP010 0651 " " " "	337	
WP011 0720 " " " "	338 - West of 84-	

### Miscellaneous Wildlife Observations:

WP009 - owl, short eared - 0644 has - 11T 0471954/4933677  
Elevation ± 4231'

---

WP012 - 7 Horses + 6 ± 1/4 mi SW + 1 horse - 14 Total  
0756 has - 11T 0474550/4922748 - Elevation ± 3041'

WP013 - 13 Horses  
- Not sure they are wild horses - w/cattle  
Near unfenced grass field

0759 has - 11T 0475962/4923048 - Elevation ± 3526'

Fuel Truck Miles: \_\_\_\_\_ Fuel Truck Driver Hours: \_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date 4-20-11 Observer: Mike Schlegel  
Matt Cambien County/Mgmt Unit: Baker Co

Time Flying Started: 0533 Time Survey Started: 0550

Time Survey Ended: 0801 Time Flight Ended: 0819

SUNRISE = 0600

Lek Name WP008

Time 0553

UTM Coord. 11T 0468815 / 4939920

Sky Conditions >75% cloud cover - Thin Layer

Ground Conditions See Photo 336

Males \_\_\_\_\_

Females 1 - Flushed

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest \_\_\_\_\_

road \_\_\_\_\_

Description of General Location See Photo 336

- on knob on Ridge Line

- sage brush / grass



**SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM**

Date: 4-20-11 Observer: Mike Schloegel / Matt Cambria County/Mgmt Unit: Baker Co

Time Flying Started: 0533 Time Survey Started: 0550

Time Survey Ended: 0801 Time Flight Ended: 0819

Sun Rise = 0600

Lek Name WP 010

Time 0651

UTM Coord. 11T 0473272 / 4932754

Sky Conditions > 75% Cloud Cover. Thin Layer

Ground Conditions See Photo 337

Males \_\_\_\_\_

Females 1 - Flushed

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest \_\_\_\_\_

road \_\_\_\_\_

Description of General Location Elevation ± 4392'

Sagebrush Ridge Line

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

Date: 4-20-11 Observer: Mike Schlegel Matt Cambier County/Mgmt Unit: Baker Co

Time Flying Started: 0533 Time Survey Started: 0550

Time Survey Ended: 0801 Time Flight Ended: 0819

SUNRISE = 0600

Lek Name WP011

Time 0720

UTM Coord. 11T 0469709 / 4925260

Sky Conditions > 75% Cloud cover - thin layer

Ground Conditions See Photo 338

Males \_\_\_\_\_

Females 1 - Flushed

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest road \_\_\_\_\_

Description of General Location Elevation ± 4850  
West of Inter State 84

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sun Rise - 0558

**DAILY FLIGHT LOG**

*No Flights - Weather*

Date: 4-21-2011

Observer: Mike Schlegel  
Matt Cambier

Time Flight Started: \_\_\_\_\_  
Time Survey Ended: \_\_\_\_\_

Time Survey Started: \_\_\_\_\_  
Time Flight Ended: \_\_\_\_\_  
Total Flight Hours: \_\_\_\_\_

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: \_\_\_\_\_ End: \_\_\_\_\_  
Start: \_\_\_\_\_ End: \_\_\_\_\_  
Start: \_\_\_\_\_ End: \_\_\_\_\_

Area Surveyed: So Baker City to Huntington

Coyotes Observed: \_\_\_\_\_  
Elk Observed: \_\_\_\_\_  
Deer Observed: \_\_\_\_\_

Sage Grouse Observed: \_\_\_\_\_  
(non-lek)

UTM's

Miscellaneous Wildlife Observations:

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

# DAILY FLIGHT LOG

Date: 4-22-11

Observer: Mike Schlegel  
Matt Cambier

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Area Surveyed: So Baker City to Huntington

Time Flight Started: 0603  
Time Survey Ended: 0701

Sunrise - 0556  
- Helicopter would not start  
Time Survey Started: 0621  
Time Flight Ended: 0751  
Total Flight Hours: 1.8

(25°F)  
Start: 20-29 End:  
Start: 0-4 End:  
Start: 0-4 End:

Ferry to  
Ontario = 1.8  

---

Total = 2.6

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

|||| = (4)

Sage Grouse Observed: \_\_\_\_\_  
(non-lek)

UTM's

No Sage Grouse

## Miscellaneous Wildlife Observations:

014 - 12 horses - 0626 - 11T0474646/4920992  
015 - 2 " 0632 - 11T0478148/4921361  
016 - 12 " 0638 - 1/2 colts  
017 - 24 " 0647 - 11T0476603  
4917766  

---

52 horses  
11T0476776  
4914926

End Survey: 0701 -  
Ferry to additional areas  
WDFW wants checked -  
West of 84 - WPL's we  
Found 50 hantavirus  
- END Survey - 0717

Ferry 0701-0707 = 6min = .1  
Survey = 0707-0717 = 10min = .2

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

11 - Rd on Ridge Line  
12 - 1/4 mi East on Ridge  
8 - Rd on Ridge to East

# DAILY FLIGHT LOG *SUNRISE - 0653 MDT*

Date: 4-23-2011

Observer: Mike Schlegel  
Matt Cambien

Time Flight Started: 0619-1 Time Survey Started: 0641  
Time Survey Ended: 0850 Time Flight Ended: 0906  
Total Flight Hours: 2.8

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 30-39 End: > 40  
Start: 0-4 End: 0-4  
Start: 0-4 End: 0-4

Area Surveyed:

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

~~|||||~~ ~~|||||~~ ~~|||||~~ = (19)

Sage Grouse Observed: Number  
(non-lek)

UTM's

WP 451 - Flashed 1 ♀ SG; 0836  
WP 454 " " " " 0843  
WP 018 - 11T 0459174 48911334 6 BIRDS - Flashed 0844 - 403 photo  
WP 452 - " 10 BIRDS - 4/50 0848 - 406 photo  
Elk 2997  
100 yds E-RQ

Miscellaneous Wildlife Observations:

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_



**SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM**

MDT - Sunrise - 0653

Date: 4-23-2011 Observer: Mike Schlegel  
Matt Cambien County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0619 Time Survey Started: 0641

Time Survey Ended: 0850 Time Flight Ended: 0906

Lek Name original 451 - Raptor vup

Time 0836 MDT

UTM Coord. 11T @ 459100 / 4889486

Sky Conditions Clear

Ground Conditions Bare - sage

Males \_\_\_\_\_

Females 1 - Flushed

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest \_\_\_\_\_  
road \_\_\_\_\_

Description of General Location Will Photograph on 4-24-11

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

MDT-Sunrise = 0653

Date 4-23-11 Observer: Mike Schilder  
Matt Cambria County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0619 Time Survey Started: 0641

Time Survey Ended: 0850 Time Flight Ended: 0906

Lek Name Original 454- Raptor wp

Time 0843 - MDT

UTM Coord. 11T 0459069 / 4892004

Sky Conditions Clean

Ground Conditions Base

Males \_\_\_\_\_

Females 1 - flushed

Unclassified \_\_\_\_\_

Total Birds 1

Directions to closest \_\_\_\_\_  
road \_\_\_\_\_

Description of General Location with photo on 4-24-11

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

MDT - Sunrise = 0653

Date 4-23-11 Observer: Mike Saiter Matt Cambrek County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0619 Time Survey Started: 0641

Time Survey Ended: 0852 Time Flight Ended: 0906

Lek Name New - WP 018

Time 0844

UTM Coord. 11T 0459174 / 4891334

Sky Conditions Clear

Ground Conditions Bare - See Photo 403

Males 6 - Flushed

Females \_\_\_\_\_

Unclassified \_\_\_\_\_

Total Birds 6

Directions to closest road 100 yds East on west side N/S Fence line

Description of General Location See Photo 403

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



SAGE GROUSE LEK SURVEY: AERIAL OBSERVER DATA FORM

MDT-Sunrise = 0653

Date 4-23-11 Observer: Mike Schlegel  
Matt Cambier County/Mgmt Unit: \_\_\_\_\_

Time Flying Started: 0619 Time Survey Started: 0641

Time Survey Ended: 0852 Time Flight Ended: 0906

Lek Name Original SG WP 452

Time 0848

UTM Coord. 11T 0459132 / 4889488

Sky Conditions Clear

Ground Conditions See Photo 406

Males 5

Females 1 } Flushed

Unclassified 5

Total Birds 10

Directions to closest road see original notes

Description of General Location See Photo 406

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# DAILY FLIGHT LOG

M DT - SUN RISE = 0651

Date: 4-24-2011  
 Observer: Mike Schlegel  
Matt Cambick

Time Flight Started: 0620 Time Survey Started: 0632  
 Time Survey Ended: 0850 Time Flight Ended: 0908  
 Total Flight Hours: 2.8

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
 Wind (MPH): 0-4; 5-10; 11-15; > 15;  
 % Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 30-39 End: > 40  
 Start: 0-4 End: 0-4  
 Start: 26-50 End: 26-50 - Thin

Area Surveyed:

Coyotes Observed: ||||| 19  
 Elk Observed: \_\_\_\_\_  
 Deer Observed: \_\_\_\_\_

Sage Grouse Observed: Number UTM's  
 (non-lek)  
 WP 484 - Flashed SG - 0729 - 3 Birds + 4300'

Miscellaneous Wildlife Observations:  
 WP 219 - owl - Burrowing - 0639 - 11T0463639/4886217  
 WP 020 " " - 0649 - 11T0461679/4889500  
 WP 482/021 - Burrowing owl - 2 - 0758 - 11T0460592/4882431  
 WP 022 - Short Eared owl - 0832 11T0463369/4885197

Fuel Truck Miles: #15 from 4-23-11 Fuel Truck Driver Hours: \_\_\_\_\_

451 - Flashed 1R - need photo  
 454 - " " - Need photo  
 452 - " 10 Birds - 448 - photo  
 018 - " 6 Birds

] Birds strutting in open area pasture area East of WP

# DAILY FLIGHT LOG *SUNRISE-0649-MOT*

Date: 4-26-2011  
Observer: *Mike Schlegel*  
*matt Cambien*

Time Flight Started: 0641 Time Survey Started: 0636  
Time Survey Ended: 0843 Time Flight Ended: 0902  
Total Flight Hours: 2.7

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 30-39 End: > 40  
Start: 5-10 End: 5-10  
Start: > 75 End: 51-75

Area Surveyed:

*more: Ontario to  
Caldwell  
add .4 hr  
Ferry*

Coyotes Observed: \_\_\_\_\_  
Elk Observed: \_\_\_\_\_  
Deer Observed: \_\_\_\_\_

*11-7*

Sage Grouse Observed: \_\_\_\_\_ Number \_\_\_\_\_ UTM's \_\_\_\_\_  
(non-lek)

*No Sage Grouse  
Very marginal + broken habitat*

## Miscellaneous Wildlife Observations:

- 0654-023 - Bald Eagle - In Flight - Ad ♂ HT 0464117/4874841*
- 0702-024 - 2 Ferruginous - HT 0462558/4870839*
- 0727-025 - Dead Golden Eagle HT 0459127/4872331*
- 0739-026 - Ferr. Hawk - Flush HT 0457811/4873215*

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

DAILY FLIGHT LOG

SUN RISE - 0646 MDT

Date: 4-27-2011

Time Flight Started: 0622 Time Survey Started: 0638  
Time Survey Ended: 0852 Time Flight Ended: 0907  
Total Flight Hours: \_\_\_\_\_

Observer: Mike Schwegel  
Matt Cambien

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 30-29 End: 740 2.8  
Start: 0-4 End: 0-4  
Start: 5-05 End: 26-50

Area Surveyed:

Coyotes Observed: \_\_\_\_\_

~~XXXXXXXXXX~~ = 16

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed: Number  
(non-lek)

UTM's

No Grouse -

END SURVEY

Miscellaneous Wildlife Observations:

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

**APPENDIX B**  
**2011 SAGE-GROUSES SURVEY**  
**WAYPOINT PHOTOGRAPHS**

### 2011 Sage-grouse Survey Waypoint Photo Log

Waypoint	Date	Photo #	Known Lek	NAD83-UTM-E	NAD83-UTM-N
1	3/22/11	1	Willow Creek Bench	0453729	4907156
2	3/22/11	2	No	0449613	4904259
3	3/22/11	3	No	0455553	4890448
4	3/22/11	4	No	0459132	4889488
4	3/28/11	5	No	0459132	4889488
4	4/23/11	6	No	0459132	4889488
4	4/24/11	7	No	0459132	4889488
5	5/23/11	8	No	0457433	4878331
6	3/26/11	9	No (2-miles to Grouse Springs)	0457474	4881881
6	3/28/11	10	No (2-miles to Grouse Springs)	0457474	4881881
7	3/27/11	11	No	0472056	4934788
8	3/29/11	No Photo	No	0445090	4968602
9	3/29/11	12	No	0440723	4969201
10	3/29/11	13	No	0440712	4974712
11	3/29/11	14	No	0438999	4975721
12	3/30/11	15	No	0436286	4983326
13	3/30/11	No Photo	No	0436962	4977210
14	4/19/11	16	No	0436609	4981690
15	4/19/11	17	No	0442620	4975445
16	4/19/11	18	No	0440182	4975921
17	4/19/11	19	Yes	0440758	4974881
18	4/19/11	20	Yes	0441871	4974526
19	4/20/11	21	No	0468815	4939920
20	4/20/11	22	No	0473272	4932754
21	4/20/11	23	No	0469709	4925260
22	4/23/11	No Photo	No	0459100	4889486
23	4/23/11	No Photo	No	0459069	4892004
24	4/23/11	24	No	0459174	4891334

**Photograph #1.**

**Waypoint 1, March 22, 2011**



**Photograph #2**

**Waypoint 2, March 22, 2011**



**Photograph #3**

**Waypoint 3, March 22, 2011**



**Photograph #4**

**Waypoint 4, March 22, 2011**



**Photograph #5**

**Waypoint 4, March 28, 2011**



**Photograph #6**

**Waypoint 4, April 23, 2011**



**Photograph #7**

**Waypoint 4, April 24, 2011**



**Photograph #8**

**Waypoint 5, March 23, 2011**



**Photograph #9**

**Waypoint 6, March 23, 2011**



**Photograph #10**

**Waypoint 6, March 28, 2011**



**Photograph #11**

**Waypoint 7, March 27, 2011**



**Waypoint 8, March 29, 2011**

No photograph was taken.

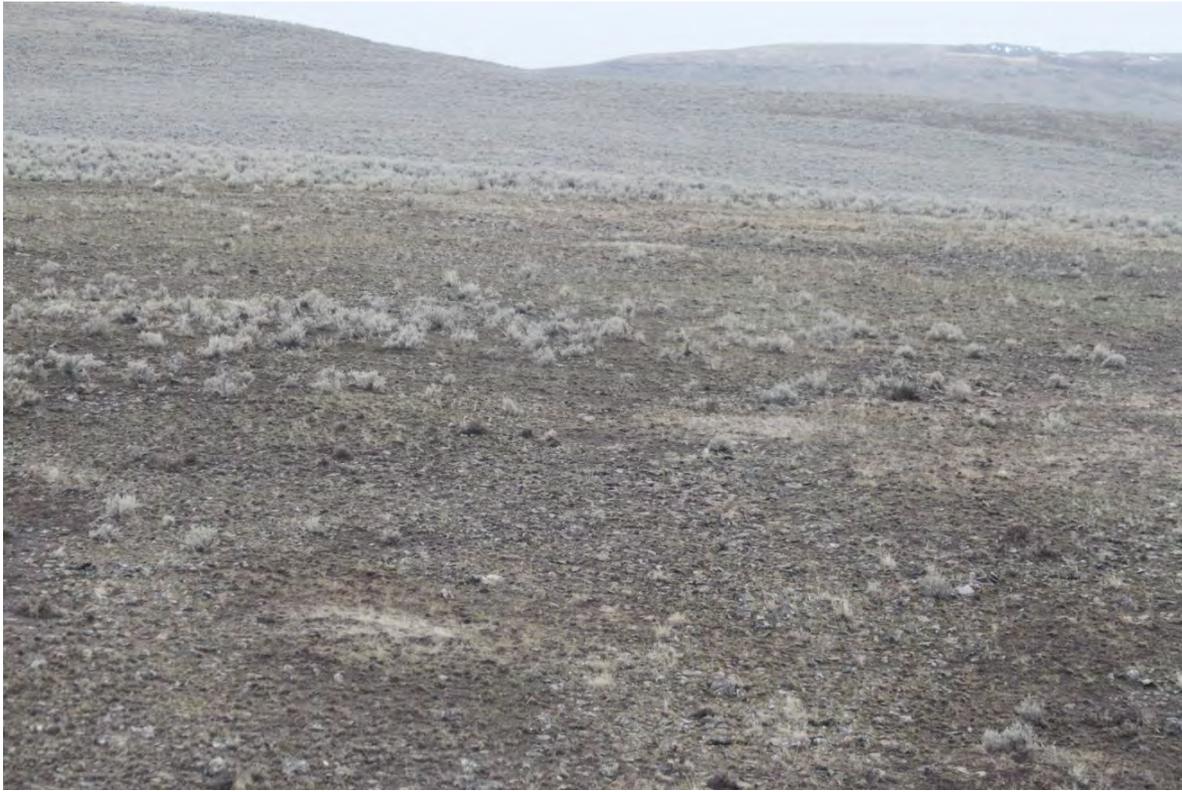
**Photograph #12**

**Waypoint 9, March 29, 2011**



**Photograph #13**

**Waypoint 10, March 29, 2011**



**Photograph #14**

**Waypoint 11, March 29, 2011**



**Photograph #15**

**Waypoint 12, March 30, 2011**



**Waypoint 13, March 30, 2011**

No photograph was taken

**Photograph #16**

**Waypoint 14, April 19, 2011**



**Photograph #17**

**Waypoint 15, April 19, 2011**



**Photograph #18**

**Waypoint 16, April 19, 2011**



**Photograph #19**

**Waypoint 17, April 19, 2011**



**Photograph #20**

**Waypoint 18, April 19, 2011**



**Photograph #21**

**Waypoint 19, April 20, 2011**



**Photograph #22**

**Waypoint 20, April 20, 2011**



**Photograph #23**

**Waypoint 21, April 20, 2011**



**Photograph #24**

**Waypoint 24, April 23, 2011.**



**All photos by Matt Cambier, 2011.**

## **2012 Report**



**TETRA TECH**

## **Boardman to Hemingway Transmission Line Project**

### **2012 Greater Sage-grouse Aerial Surveys**



**4342RPT.DOC  
October 2012**

# **Boardman to Hemingway Transmission Line Project**

## **2012 Greater Sage-grouse Aerial Surveys**

*Prepared for:*



1211 West Idaho Street  
Boise, ID 83702

*Prepared by:*

### **Tetra Tech**

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Tetra Tech Project No. 8540146.107.005.04

October 2012

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## 1.0 INTRODUCTION

Idaho Power Company (Idaho Power) is proposing to construct and operate a new, approximately 300-mile-long, single-circuit 500 kilovolt (kV) electric transmission line between northeast Oregon and southwest Idaho (hereinafter the B2H Project or Project). The overhead 500 kV transmission line will carry energy bi-directionally between a Portland General Electric planned substation (Grassland Substation) adjacent to the Boardman Generating Plant, near Boardman in Morrow County, Oregon, and Idaho Power's existing Hemingway Substation, located in Owyhee County, Idaho (**Figure 1**). The Project will traverse Federal, state, and private lands in 6 counties in Oregon and Idaho.

The Project would result in disturbances related to the construction of permanent facilities such as transmission tower pads, substations, regeneration stations, and permanent access roads, as well as temporary disturbances related to fly yards, lay down areas, tensioning sites, and temporary access roads. To help determine the degree of impact that could occur due to the construction and operation of these Project components, the occurrence of greater sage-grouse (*Centrocercus urophasianus*) along the Project needs to be determined. Of particular interest are the locations of sage-grouse breeding grounds (leks) in relation to proposed Project components.

The Project, as proposed, would cross both public and private lands. Public lands that would be crossed are managed, in part, with the intent of conserving and improving wildlife populations, and public land managers have gathered data on lands they manage over the years. Data for private lands, with the exception of some statewide data gathered by state wildlife management agencies, are largely unavailable. This means that existing databases could not always be used to determine the locations of sage-grouse leks that could be impacted by the Project consistently across jurisdictions. Therefore, sage-grouse lek surveys were implemented to supplement existing data.

## 2.0 SURVEY AREA

The approach to delineating survey areas began by identifying where the proposed route and alternatives for the transmission line intersected sage-grouse habitat. This was initially completed using known species distribution and vegetation data. A 3-mile buffer on each side of the proposed route and alternatives was incorporated to satisfy the Oregon Department of Fish and Wildlife (ODFW) recommendation of siting transmission lines at least 2 miles from occupied leks (ODFW 2009), with an additional mile to allow Idaho Power flexibility in making siting adjustments if needed. Meetings with both state and Federal biologists prior to the 2010 survey effort further refined the survey area based on the biologist's familiarity with the species and the quality of habitats within their management districts. Both the 2011 and 2012 survey areas were also reviewed by ODFW biologists.

The Idaho Power sage-grouse surveys were designed to be completed during the permitting process to inform the design and siting of the Project. The 2010 survey (URS 2010) area included sections of the proposed route that are adjacent to known occupied leks where identification of a new lek(s) would not allow for siting the transmission line outside of the 2-mile avoidance buffer. The 2011 survey (Tetra Tech 2011a) area included the remainder of potential sage-grouse habitat not surveyed in 2010 and covered areas with lower known occupied lek densities. The 2012 survey effort occurred along the recently developed Willow Creek and Malheur S alternatives as well as changes in the proposed route that had not yet been surveyed (March 1, 2012 layout). Survey areas by year are shown in **Figure 2**.

### 3.0 METHODS

Survey methods utilized for this study come from the lek search procedures described in the 2005 ODFW *Greater Sage-grouse Conservation Assessment and Strategy for Oregon* (Hagen 2005) and were adapted for this Project and included in the 2011 Biological Survey Work Plan (Tetra Tech 2011b). In general, the survey areas were flown by helicopter in transects spaced between 0.25 and 0.5 mile apart. The helicopter flies 20 – 50 feet above the ground at speeds ranging from 30 – 50 mph. Surveys typically began 15 – 20 minutes before sunrise and continued for 2 hours after sunrise. The survey area was flown twice between April 3<sup>rd</sup> and April 16<sup>th</sup>, 2012 in 2 separate survey periods.

The survey crew used GPS technology for data collection activities. The survey area was uploaded to the on-board aeronautical AvMap GPS unit so the pilot could easily navigate the survey area and accurately space the survey transects. Sage-grouse observations were marked using Garmin hand-held GPS units. Corresponding notes were written on ODFW paper flight logs and observation forms (**Appendix A**). Pictures were taken at each observation site (**Appendix B**).

Aerial lek searches were performed using a Bell 206 Jet Ranger operated by JL Aviation out of Boring, Oregon. The lead observer was Mike Schlegel, a retired regional wildlife biologist with Idaho Department of Fish and Game. Both JL Aviation and Mr. Schlegel have several years of experience flying sage-grouse and other wildlife surveys for ODFW. Matt Cambier with Tetra Tech from Boise, Idaho coordinated survey efforts and served as the second observer. This team has performed all 3 seasons of sage-grouse surveys for the Project.

### 4.0 RESULTS

A total of 26 observations were recorded during the 2012 sage-grouse surveys. An observation can include 1 to dozens of sage-grouse being counted; and correlates to a waypoint recorded at the location where the bird(s) are observed. Grouse were observed at 23 unique locations, with 3 of those locations having grouse observed during both survey periods. A total of 88 sage-grouse were recorded during 2012. The results are presented chronologically by survey period.

#### Survey Period 1

The first survey period occurred over 3 days between April 3<sup>rd</sup> and April 7<sup>th</sup>, 2012. Surveys began adjacent to the Malheur S alternative and moved west and north towards the Willow Creek alternative (**Figure 2**). On April 3<sup>rd</sup> the Malheur S alternative was flown from milepost 20 to milepost 11. Inclement weather on April 4<sup>th</sup> prevented surveys from being performed. On April 5<sup>th</sup>, the remainder of the survey area adjacent to the Malheur S alternative was flown from milepost 11 to milepost 2, as well as a portion of the survey area adjacent to the proposed route from milepost 227 to 221. On April 6<sup>th</sup> the remainder of the survey area adjacent to the proposed route was flown from milepost 221 to 217. Also on April 6<sup>th</sup>, the survey area adjacent to the Willow Creek alternative was flown from milepost 16 to milepost 10. The first survey period ended on April 7<sup>th</sup> when the remainder of the 2012 sage-grouse survey area was flown from milepost 10 to milepost 3.5 of the Willow Creek alternative. Results of Survey Period 1 are displayed in **Table 1** and **Figures 3 & 4**.

**Table 1. 2012 Sage-grouse Survey Results for Survey Period 1**

Date	Data Sheet GPS ID	Waypoint	Milepost	M <sup>1</sup>	F <sup>2</sup>	U <sup>3</sup>	Total	Strutting	Known Lek
4/5	974	1	225 Proposed	0	1	0	1	No	No
4/5	975	2	224 Proposed	0	1	0	1	No	No
4/5	976	3	224 Proposed	0	1	0	1	No	No
4/6	1	4	219 Proposed	3	0	0	3	Yes	Thorn Creek Beulah Lek within 0.5 mile
4/6	2	5	219 Proposed	2	0	0	2	No	No
4/6	3	6	219 Proposed	0	1	0	1	No	No
4/6	4	7	219 Proposed	0	1	0	1	No	No
4/6	5	8	219 Proposed	0	1	0	1	No	No
4/6	6	9	12 Willow Creek	0	1	0	1	No	No
4/6	7	10	11 Willow Creek	6	0	5	11	No	No
4/7	9	11	10 Willow Creek	3	1	1	5	No	No
4/7	10	12	9 Willow Creek	0	1	0	1	No	No
4/7	11	13	9 Willow Creek	0	1	0	1	No	No

<sup>1</sup> M = Number of male sage-grouse observed.

<sup>2</sup> F = Number of female sage-grouse observed.

<sup>3</sup> U = Number of unknown sex sage-grouse observed.

Sage-grouse were observed on April 5<sup>th</sup>, 6<sup>th</sup>, and 7<sup>th</sup> within the survey area from milepost 219 to milepost 225 of the proposed route (**Figure 3**) and milepost 9 to milepost 12 of the Willow Creek alternative (**Figure 4**). A total of 13 observations were recorded within these 3 days.

Waypoints 1, 2, 3, 6, 7, 8, 9, 12, and 13 were each sightings of a single female grouse.

At Waypoint 4 (**Figure 3**), 3 male sage-grouse were observed and mating displays (strutting) were verified. This location is approximately 2.5 miles west of the proposed route near milepost 219. It is approximately 0.5 mile northeast of the Thorn Creek Beulah lek, which is currently listed as occupied pending by ODFW (ODFW 2011). The birds were on a flat bench area near a livestock corral. Strutting was observed in a wet, spring-fed pasture area below the corral.

At Waypoint 5 (**Figure 3**), 2 male sage-grouse were flushed. The location is approximately 1.25 miles west of the proposed route near milepost 219. No strutting was observed. The birds flushed from a flat and rocky sagebrush dwarf-shrub-steppe system.

At Waypoint 10 (**Figure 4**), a total of 11 birds were flushed from a single location. Of these, 6 were identified as male and 5 were unclassified. The location is approximately 1.4 miles north of the Willow Creek alternative near milepost 11. The birds flushed from a relatively open rocky knob of a hill in a big sagebrush area co-dominated by annual grasslands.

At Waypoint 11 (**Figure 4**), a total of 5 sage-grouse were flushed. There were 3 male, 1 female, and 1 unclassified bird. The location is approximately 1.5 miles north of the Willow Creek alternative near milepost 10. Grouse flushed from a sagebrush steppe area.

## Survey Period 2

The second Survey Period occurred over 4 days from April 13<sup>th</sup> to April 16<sup>th</sup>, 2012. Surveys began near Huntington, Oregon along the Willow Creek alternative and moved south towards the Malheur S alternative south of Vale, Oregon. On April 13<sup>th</sup> the Willow Creek alternative was flown from milepost 3.5 to milepost 11.5. On April 14<sup>th</sup> the remainder of the survey area adjacent to the Willow Creek alternative was flown from milepost 16 to milepost 11.5, as well as a small portion of the survey area adjacent to the proposed route from milepost 219 to 222. High winds on April 14<sup>th</sup> ended the sage-grouse survey early. On April 15<sup>th</sup> the remainder of the survey area adjacent to the proposed route was flown from milepost 217 to 227 as well as some of the survey area adjacent to the Malheur S alternative from milepost 6 to milepost 9.5. The second survey period ended on April 16<sup>th</sup> when the remainder of the 2012 sage-grouse survey area was flown from milepost 9.5 to milepost 21 of the Malheur S alternative. In addition, observations of sage-grouse on April 12<sup>th</sup> and June 7<sup>th</sup> occurred during the 2012 raptor nest survey. Results of Survey Period 2 are displayed in **Table 2** and **Figures 5 & 6**.

**Table 2. 2012 Sage-grouse Survey Results for Survey Period 2**

Date	Data Sheet GPS ID	Waypoint	Milepost	M <sup>1</sup>	F <sup>2</sup>	U <sup>3</sup>	Total	Strutting	Known Lek
4/12	55	14	2 Willow Creek	0	1	0	1	No	No
4/12	63	15	2 Willow Creek	1	0	0	1	No	No
4/13	304	16	6 Willow Creek	10	0	0	10	No	No
4/13	305	17	6 Willow Creek	1	0	0	1	No	No
4/13	306	18	9 Willow Creek	0	1	0	1	No	No
4/13	308	19	7 Willow Creek	0	1	0	1	No	No
4/13	309	20	10 Willow Creek	0	1	0	1	No	No
4/13	7	10	11 Willow Creek	1	0	12	13	Yes	No
4/15	3	6	219 Proposed	0	1	0	1	No	No
4/15	390	21	223 Proposed	0	1	0	1	No	No
4/15	391	22	224 Proposed	0	1	0	1	No	No
4/15	1	4	219 Proposed	3	0	3	6	Yes	Thorn Creek Beulah Lek within 0.5 mile
6/7	904	23	202 Proposed	0	0	20	20	No	North Birch Creek #1 / #2 within 1 mile

<sup>1</sup> M = Number of male sage-grouse observed.

<sup>2</sup> F = Number of female sage-grouse observed.

<sup>3</sup> U = Number of unknown sex sage-grouse observed.

Sage-grouse were observed on April 12<sup>th</sup>, 13<sup>th</sup>, and 15<sup>th</sup> within the survey area from milepost 2 to milepost 11 of the Willow Creek alternative (**Figure 5**) and milepost 202 to milepost 224 of the proposed route (**Figure 6**). A total of 12 observations were recorded within these 3 days. An additional observation was recorded outside the sage-grouse breeding season on June 7<sup>th</sup> during raptor nest surveys.

Waypoints 14, 18, 19, 20, 6, 21, and 22 were each sightings of a single female grouse. Of interest is Waypoint 6, where a female sage-grouse was flushed during both survey periods.

At Waypoint 15 (**Figure 5**), a single male sage-grouse was flushed. This location is approximately 0.5 mile north and east of the Willow Creek alternative near milepost 2.

At Waypoint 16 (**Figure 5**), 10 male sage-grouse were flushed from a single location. This location is approximately 1.7 miles east of the Willow Creek alternative near milepost 6. The birds were flushed from an area dominated by annual grasslands on a bench above Birch Creek.

At Waypoint 17 (**Figure 5**), a single male sage-grouse was flushed. It is likely that this bird was part of the group flushed at Waypoint 16. The area is sagebrush and annual grassland and adjacent to an irrigation canal.

At Waypoint 10 (**Figure 5**), a total of 13 birds were flushed. Of these, 1 was identified as male and the rest were unclassified. The male sage-grouse was seen strutting. This waypoint had several sage-grouse observed during both survey periods. Of the 13 grouse recorded, 8 grouse (including a strutting male) were flushed from Waypoint 10 and 5 others were flushed approximately 0.3 mile to the north and northwest along the same topographic feature. They were combined into a single observation.

At Waypoint 4 (**Figure 6**), 3 male sage-grouse were observed strutting and 3 other unclassified grouse were flushed from the same location as 3 grouse were observed during survey period 1. This location is approximately 2.5 miles west of the proposed route near milepost 219. It is approximately 0.5 mile northeast of the Thorn Creek Beulah lek, which is currently listed as occupied pending by ODFW (ODFW 2011).

At waypoint 23 (**Figure 5**), a total of approximately 20 sage-grouse were flushed on June 7<sup>th</sup> during the 2012 raptor nest surveys. This location is approximately 1.7 miles southeast of the proposed route near milepost 202. The North Birch Creek #1 and North Birch Creek #2 leks, both identified as occupied pending by ODFW (ODFW 2011), are less than 1 mile to the south.

## 5.0 DISCUSSION

The official designation of lek status in Oregon is the responsibility of ODFW. Lek status is described by ODFW by both an annual status and a conservation status. An annual lek status is given to leks based on their activity level during the breeding season in a year in which surveys are performed. The annual status can be active, inactive, or unknown. The conservation status is a more long-term designation and is used for conservation and project mitigation actions. The different categories of conservation status depend on the level of survey effort and the annual status of a site over several years. More detailed information on lek status can be found in the *Greater Sage-grouse Conservation Assessment and Strategy for Oregon* (Hagen 2011). To assist Idaho Power in the siting of the Project and to inform the permitting process, this discussion identifies observations that were given a lek status designation from ODFW.

ODFW defines an active lek as a site attended by 1 or more male sage-grouse during the breeding season (Hagen 2011). Of the 26 observations recorded, 2 of them meet the criteria defined by ODFW that indicates an active lek. These 2 observations documented the presence of 1 or more male sage-grouse at the same location during both survey periods. Waypoint 4 and

Waypoint 10 both show activity that would indicate they are being used by sage-grouse during the breeding season for mating display purposes. Waypoint 4 and Waypoint 10 will be given an annual lek status of active and a conservation status of occupied pending by ODFW.

At Waypoint 4 during the first survey period, a single male was seen strutting and 2 other male sage-grouse flushed from the site. During the second survey period, 3 strutting males were observed and an additional 3 unclassified grouse flushed from the location (**Figure 7**). In addition to strutting male sage-grouse at Waypoint 4, a female sage-grouse was identified at Waypoint 6 during both survey periods. Waypoint 6 is approximately 1 mile from Waypoint 4 and located on the same topographic feature (Thorn Flat). The site fidelity that the female showed to Waypoint 6 could indicate a nest site. ODFW considers this an active lek site and it will receive a conservation status of occupied pending.

Surveyors recorded 11 sage-grouse during the first survey period and 13 sage-grouse during the second survey period at Waypoint 10. However, mating displays were only observed during the second survey period and only 1 male was observed strutting. Given the number of grouse recorded at Waypoint 10 during both survey periods, this location is considered an active lek by ODFW considers this an active lek site and it will receive a conservation status of occupied pending. Also of interest is that this location is in proximity to a new lek identified in the 2010 report (URS 2010) as Observation 52 that ODFW has given a conservation status of occupied pending. The lek in the 2010 report is within 2 miles of Waypoint 10 and located further up the same ridgeline (**Figure 7**).

Waypoint 5 had 2 male sage-grouse recorded at that location during the first survey period. However, during the second survey period no activity was recorded. Given the proximity of Waypoint 5 to Waypoint 4, it is possible that the 2 sage-grouse identified at Waypoint 5 during the first survey period are associated with the breeding behaviors occurring at Waypoint 4 and could be indicative of a lek complex in the area. Waypoint 5 is given an annual lek status of unknown by ODFW. Waypoint 5 has been recommended for follow-up surveys next breeding season to better understand the activity level at the site and to attribute a conservation status if warranted.

Waypoint 11 had 5 sage-grouse at that location during the first survey period. However, during the second survey period this location did not show any activity. Considering the proximity of Waypoint 11 to Waypoint 10, it is possible that the grouse identified at Waypoint 11 during the first survey period are associated with the breeding behaviors occurring at Waypoint 10 and could be indicative of a lek complex in the area. Waypoint 11 is given an annual lek status of unknown by ODFW. Waypoint 11 has been recommended for follow-up surveys next breeding season to better understand the activity level at the site and to attribute a conservation status if warranted.

During the second survey period, 10 male sage-grouse were flushed from Waypoint 16. Waypoint 11 is given an annual lek status of unknown by ODFW. Considering the location of this observation and the potential impact it could have on the siting of the Willow Creek alternative, Waypoint 11 has been recommended for follow-up surveys next breeding season to better understand the activity level at the site and to attribute a conservation status if warranted.

The group of sage-grouse flushed in the Little Valley on June 7<sup>th</sup> during the raptor nest survey is likely associated with the North Birch Creek #1, North Birch Creek #2, or Chicken Table leks to the south. Given the time of year, this location would not indicate breeding activities and more likely identifies an area of post-breeding use; whether nesting/brood rearing, summer habitat, or a migration route between breeding and summer habitats.

Aerial surveys for sage-grouse leks were conducted from April 3<sup>rd</sup> through April 16<sup>th</sup>, 2012. The goal of this survey was to identify sage-grouse leks that were previously unknown to ODFW and

Idaho Power. Surveys identified 2 previously undocumented active lek sites at Waypoint 4 and Waypoint 10 that are given a conservation status of occupied pending. An additional 3 observations (Waypoints 5, 11, and 16) are considered unknown status leks at this time with a conservation status designation pending follow-up surveys.

*Prepared by:*

*Reviewed by:*



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Matt Cambier  
Wildlife Biologist, Tetra Tech



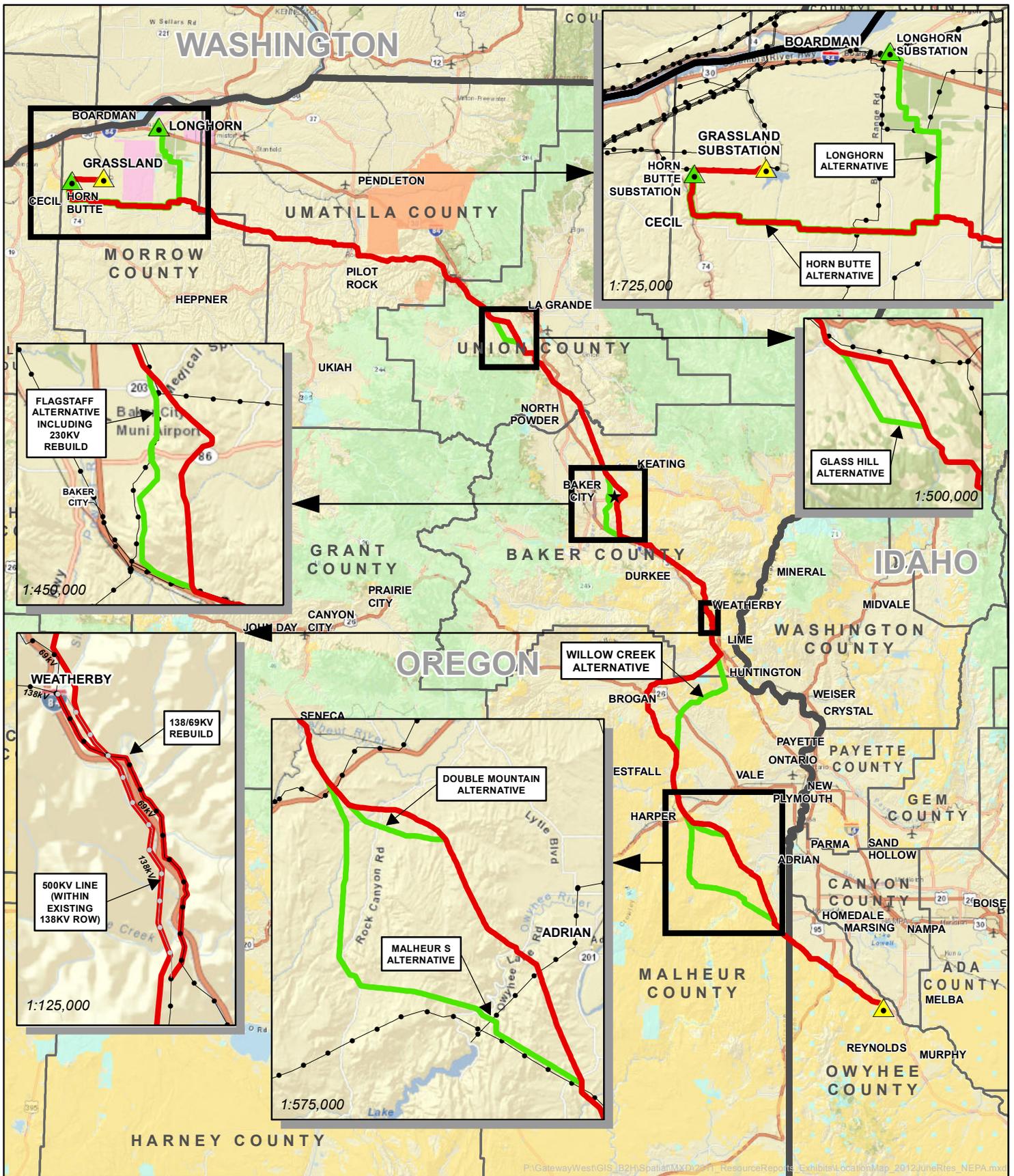
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Aaron English  
Supervising Scientist, Tetra Tech

## 6.0 REFERENCES

- Hagen, C. A. 2011. *Greater Sage-Grouse Conservation Assessment and Strategy for Oregon: A Plan to Maintain and Enhance Populations and Habitat*. ODFW, Salem, OR.
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- ODFW. 2011. Public Records Request #5205. Current greater sage-grouse lek data for the entire state of Oregon. GIS Data. Received September 2011 from Christian Hagen.
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- URS Corporation. 2010. *Technical Report 2010 Greater Sage-grouse Aerial Surveys for the Boardman to Hemingway Transmission Line Project*. Prepared for Idaho Power Company. Boise, ID.

## **FIGURES**



**FIGURE 1**  
**PROJECT OVERVIEW**  
**2012 GREATER SAGE-GROUSE SURVEY**  
**TECHNICAL REPORT**

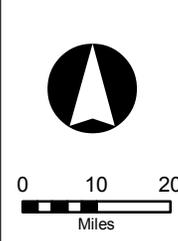
BOARDMAN TO HEMINGWAY  
 500KV TRANSMISSION LINE PROJECT  
 OREGON-IDAHO

OCTOBER 2012



- ★ National Historic Oregon Trail Interpretive Center
- ▲ Proposed Substation
- ▲ Alternate Substation
- Proposed Route 20120301
- IPC Alternative 20120301
- Proposed Rebuild 20120301

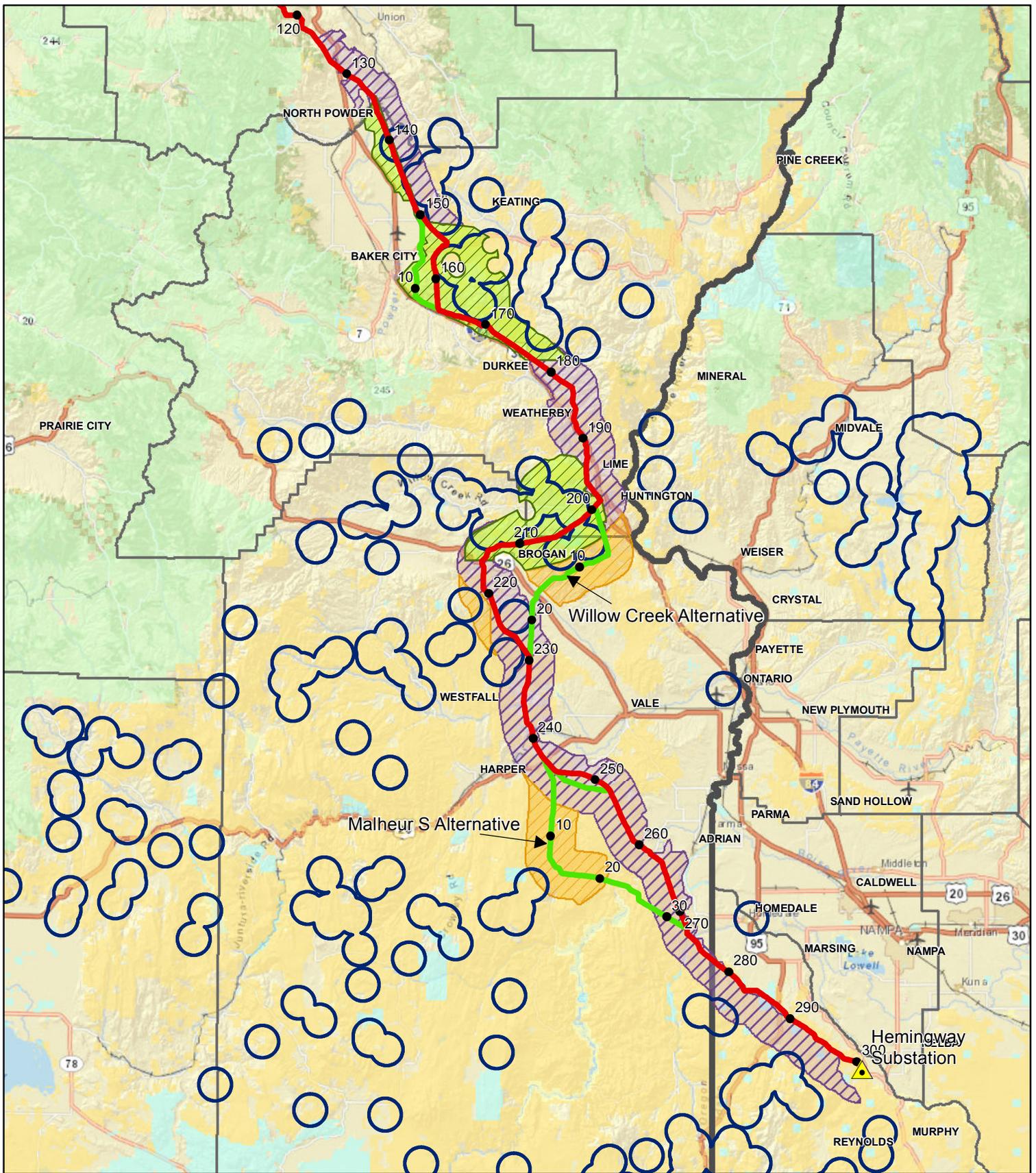
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- ▭ County Boundary
- ▭ Bureau of Land Management
- ▭ Bureau of Reclamation
- ▭ Department of Defense
- ▭ Forest Service
- ▭ Indian Reservation
- ▭ Private
- ▭ State



**LOCATION MAP**



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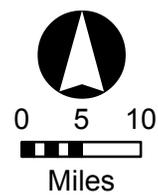


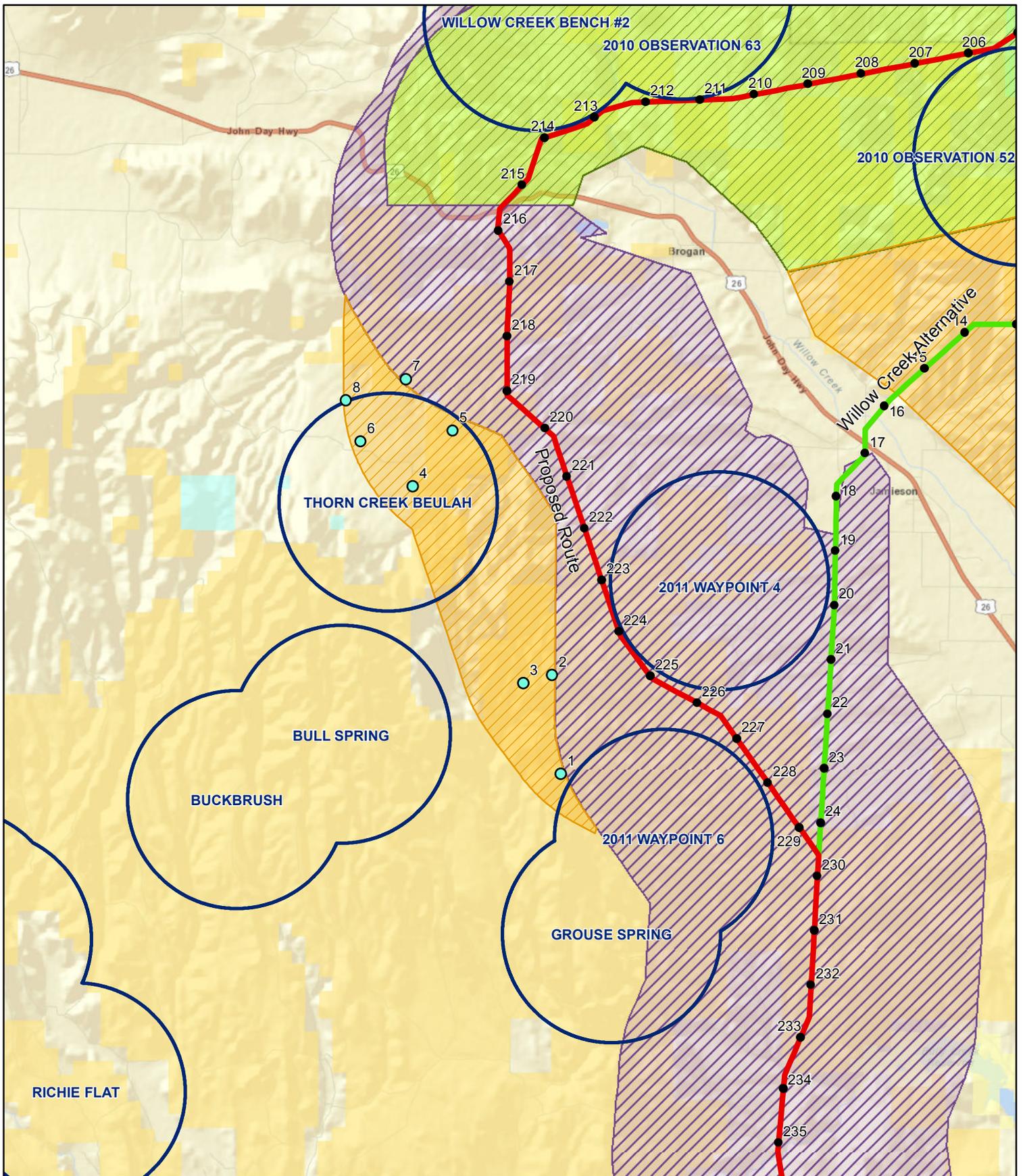
**FIGURE 2**  
**SAGE-GROUSE SURVEY AREAS**  
**2012 GREATER SAGE-GROUSE SURVEY**  
**TECHNICAL REPORT**

BOARDMAN TO HEMINGWAY  
 500kV TRANSMISSION LINE PROJECT  
 OREGON-IDAHO  
 OCTOBER 2012



- |  |                              |  |                           |
|--|------------------------------|--|---------------------------|
|  | 2010 Sage-grouse Survey Area |  | State Boundary            |
|  | 2011 Sage-grouse Survey Area |  | County Boundary           |
|  | 2012 Sage-grouse Survey Area |  | Bureau of Land Management |
|  | 2-mile Lek Buffer            |  | Bureau of Reclamation     |
|  | Proposed Substation          |  | Department of Defense     |
|  | Alternate Substation         |  | Forest Service            |
|  | Proposed Route 20120301      |  | Indian Reservation        |
|  | IPC Alternative 20120301     |  | Private                   |
|  | Milepost (10-mile)           |  | State                     |



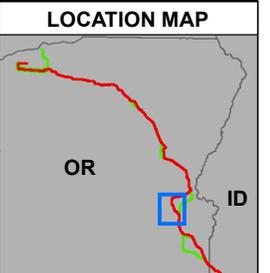
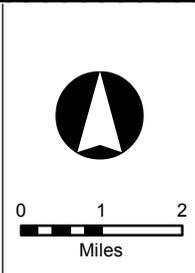


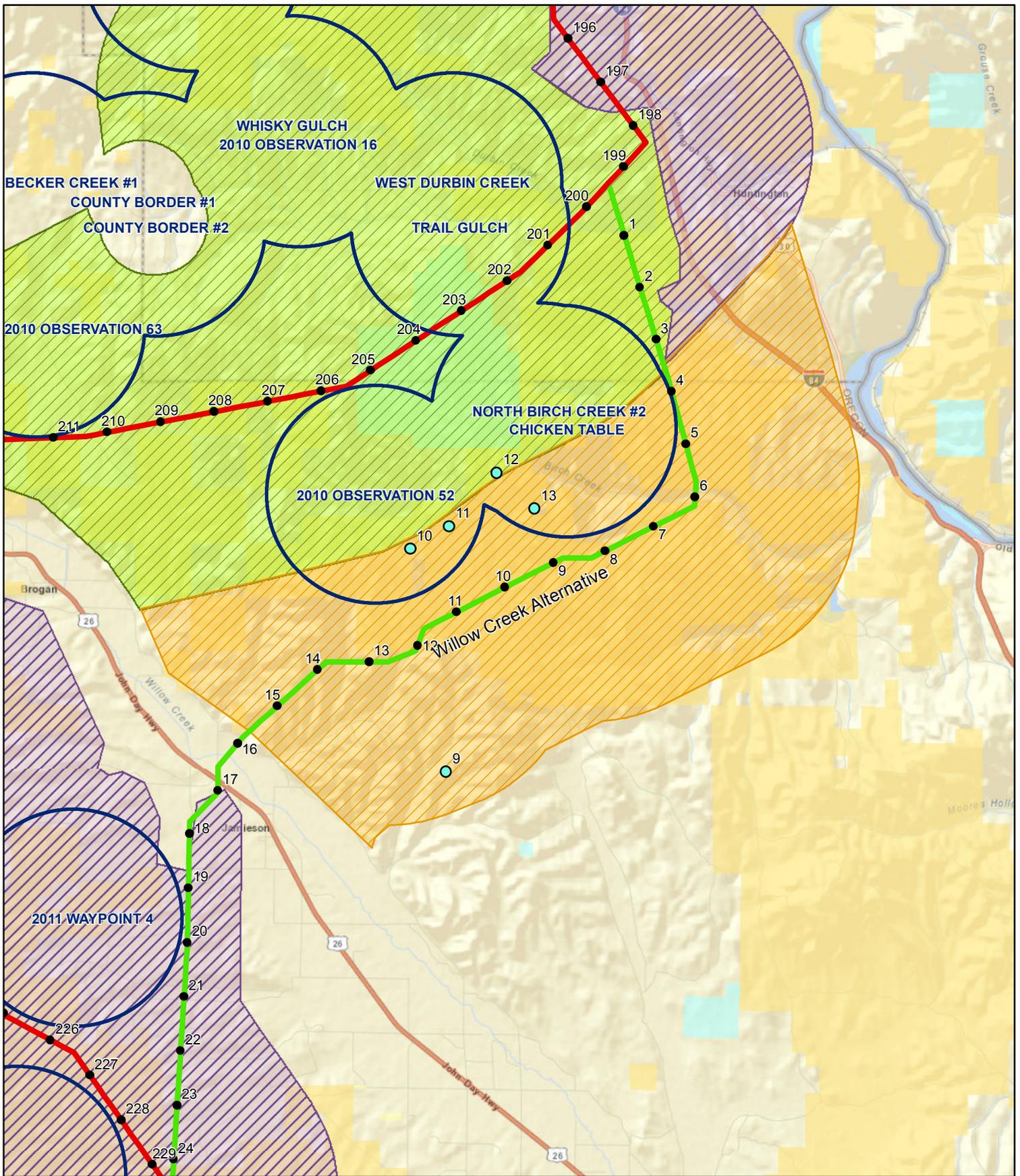
**FIGURE 3**  
**SURVEY PERIOD 1 SURVEY RESULTS**  
**PROPOSED ROUTE**  
**2012 GREATER SAGE-GROUSE SURVEY**  
**TECHNICAL REPORT**

BOARDMAN TO HEMINGWAY  
 500KV TRANSMISSION LINE PROJECT  
 OREGON-IDAHO  
 OCTOBER 2012



- |  |                           |
|--|---------------------------|
| Waypoint   | Indian Reservation        |
| 2012 Survey Area                                 | Bureau of Land Management |
| 2011 Survey Area                                 | Bureau of Reclamation     |
| 2010 Survey Area                                 | Department of Defense     |
| Proposed Route 20120301                          | Private                   |
| IPC Alternative 20120301                         | State                     |
| Milepost   | U.S. Forest Service       |
| Oregon Occupied or Occupied Pending Status Leaks |                           |





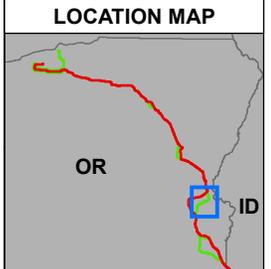
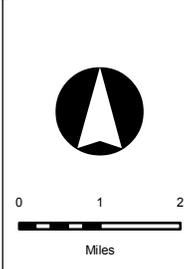
**FIGURE 4**  
**SURVEY PERIOD 1 SURVEY RESULTS**  
**WILLOW CREEK ALTERNATIVE**  
**2012 GREATER SAGE-GROUSE SURVEY**  
**TECHNICAL REPORT**

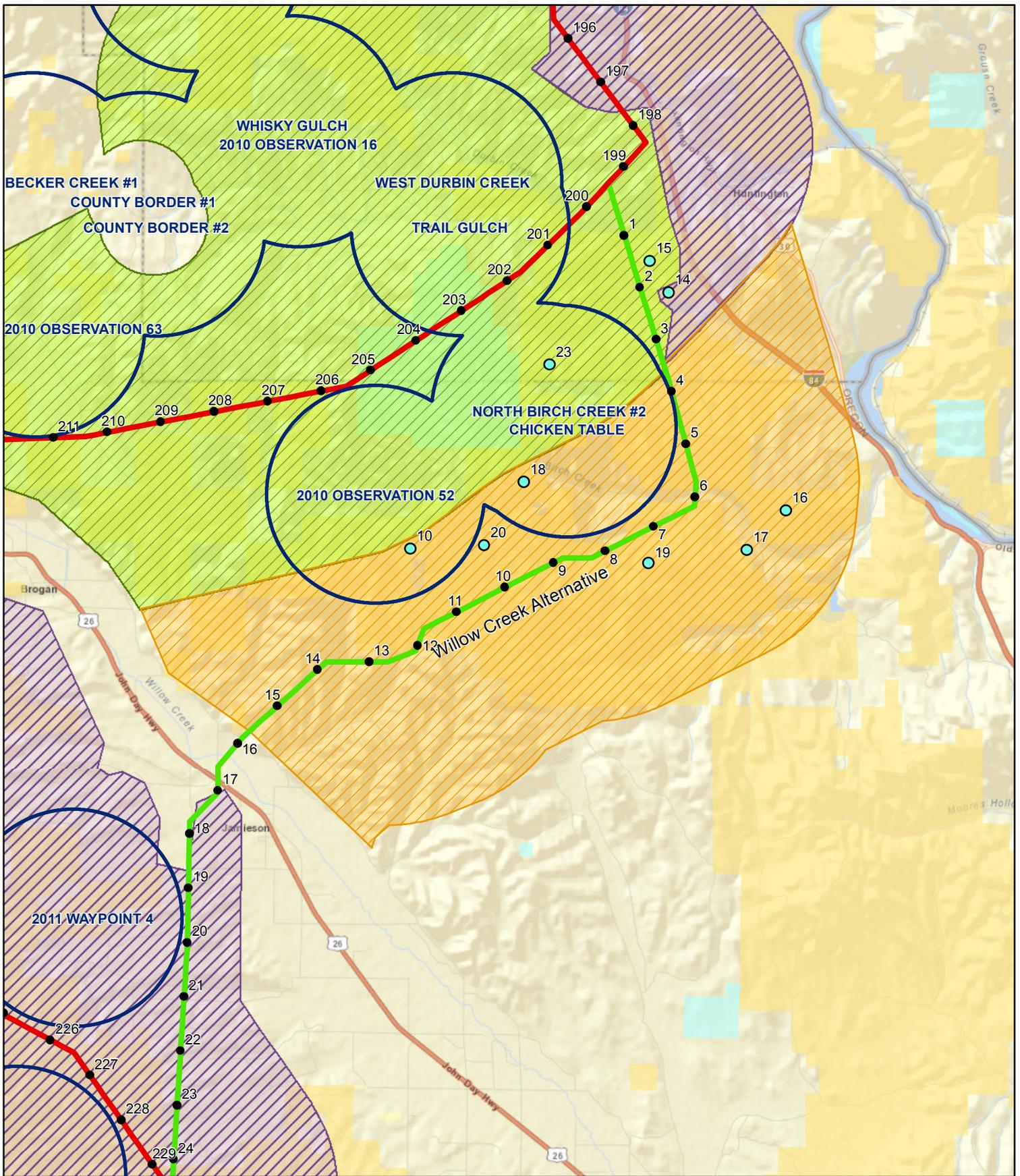
BOARDMAN TO HEMINGWAY  
 500kV TRANSMISSION LINE PROJECT  
 OREGON-IDAHO

OCTOBER 2012



- |  |                           |
|--|---------------------------|
| Waypoint   | Indian Reservation        |
| 2012 Survey Area                                 | Bureau of Land Management |
| 2011 Survey Area                                 | Bureau of Reclamation     |
| 2010 Survey Area                                 | Department of Defense     |
| Proposed Route 20120301                          | Private                   |
| IPC Alternative 20120301                         | State                     |
| Milepost   | U.S. Forest Service       |
| Oregon Occupied or Occupied Pending Status Leaks |                           |





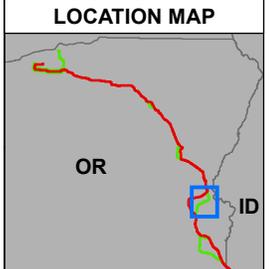
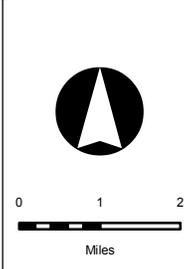
**FIGURE 5**  
**SURVEY PERIOD 2 SURVEY RESULTS**  
**WILLOW CREEK ALTERNATIVE**  
**2012 GREATER SAGE-GROUSE SURVEY**  
**TECHNICAL REPORT**

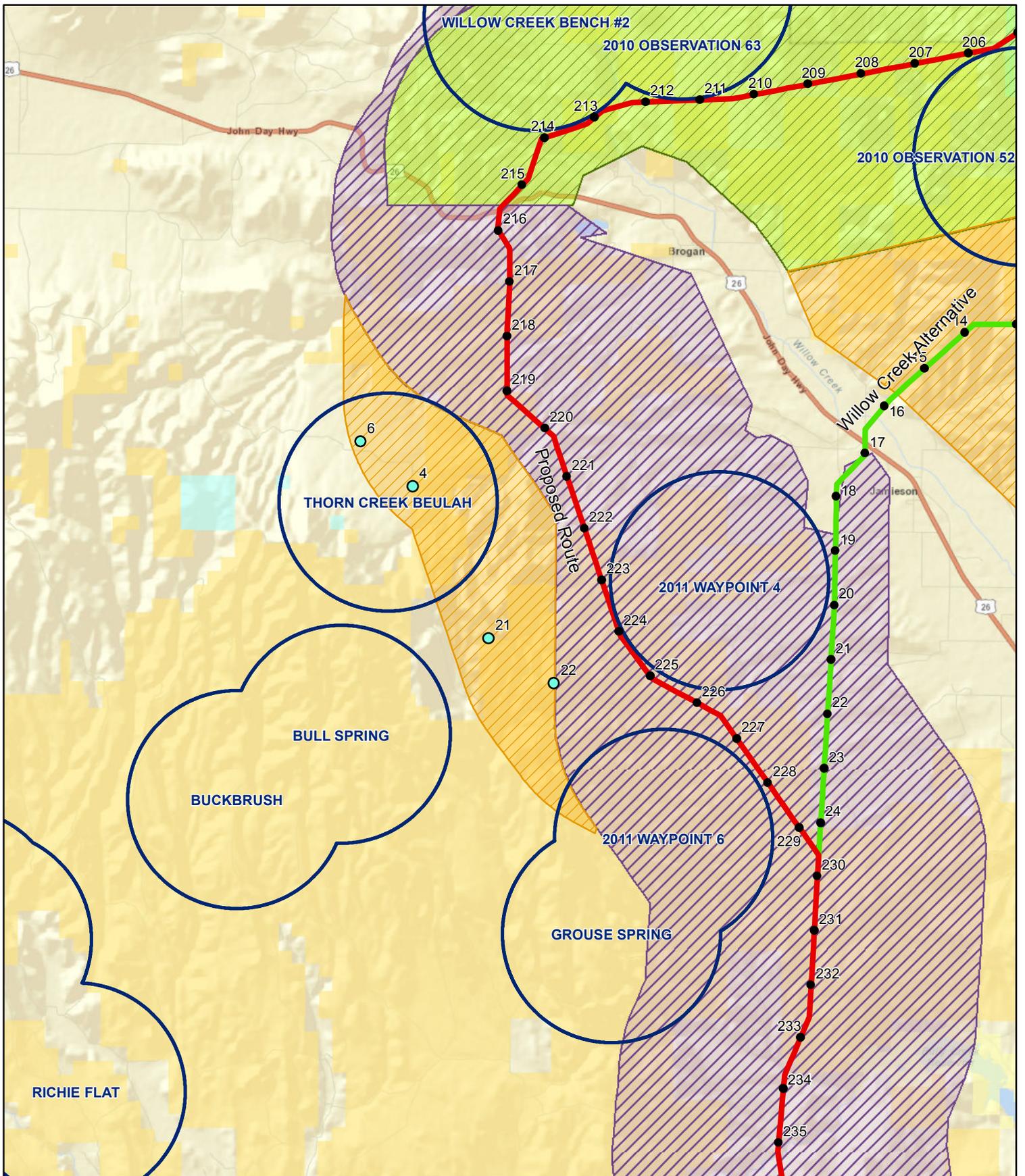
BOARDMAN TO HEMINGWAY  
 500kV TRANSMISSION LINE PROJECT  
 OREGON-IDAHO

OCTOBER 2012



- Waypoint
- 2012 Survey Area
- 2011 Survey Area
- 2010 Survey Area
- Proposed Route 20120301
- IPC Alternative 20120301
- Milepost
- Oregon Occupied or Occupied Pending Status Leaks
- Indian Reservation
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Private
- State
- U.S. Forest Service



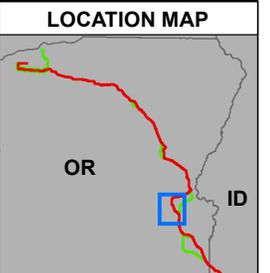
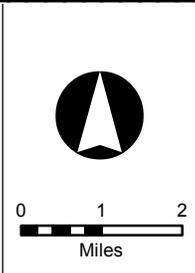


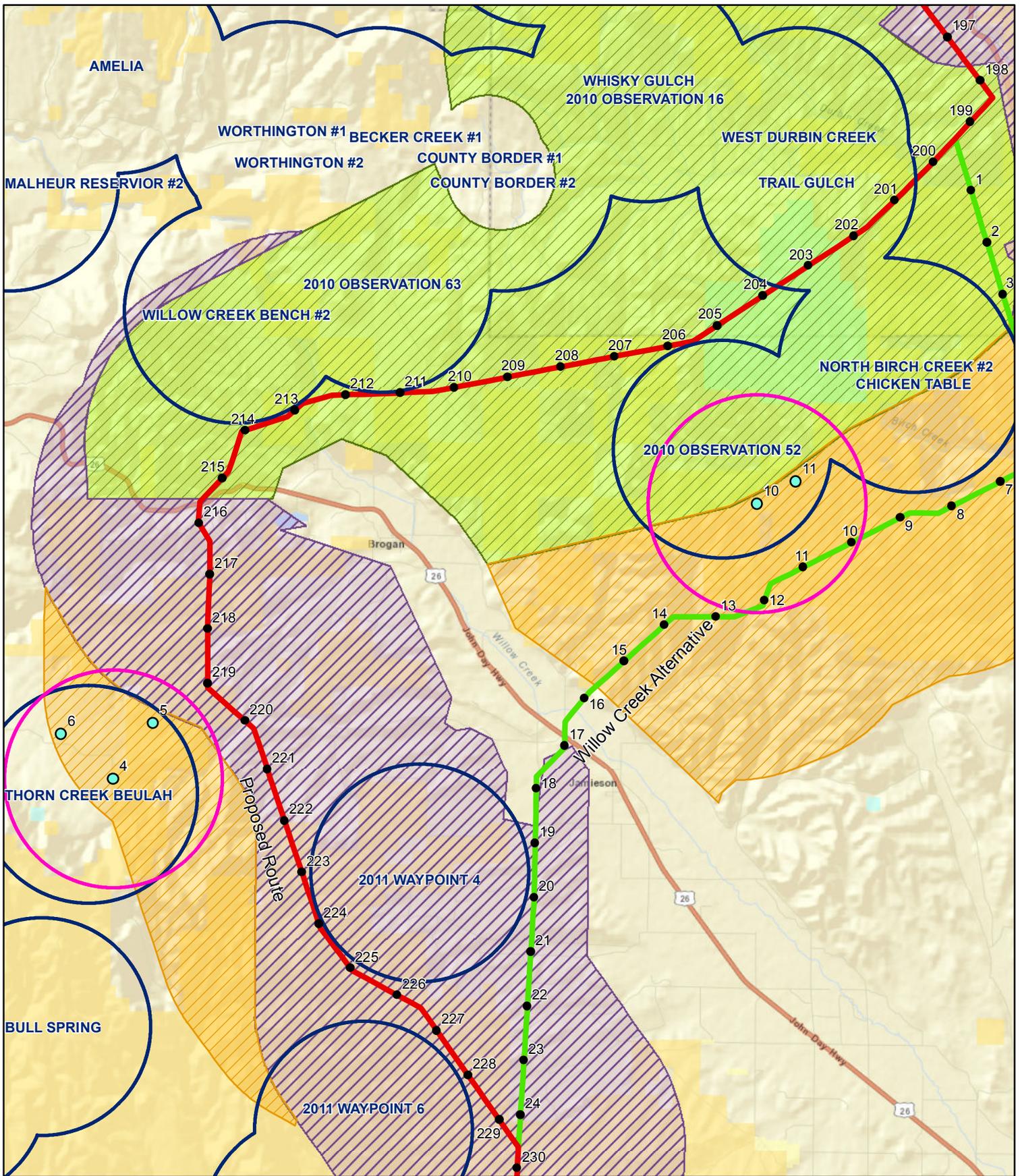
**FIGURE 6**  
**SURVEY PERIOD 2 SURVEY RESULTS**  
**PROPOSED ROUTE**  
**2012 GREATER SAGE-GROUSE SURVEY**  
**TECHNICAL REPORT**

BOARDMAN TO HEMINGWAY  
 500KV TRANSMISSION LINE PROJECT  
 OREGON-IDAHO  
 OCTOBER 2012



- |  |                           |
|--|---------------------------|
| Waypoint   | Indian Reservation        |
| 2012 Survey Area                                 | Bureau of Land Management |
| 2011 Survey Area                                 | Bureau of Reclamation     |
| 2010 Survey Area                                 | Department of Defense     |
| Proposed Route 20120301                          | Private                   |
| IPC Alternative 20120301                         | State                     |
| Milepost   | U.S. Forest Service       |
| Oregon Occupied or Occupied Pending Status Leaks |                           |



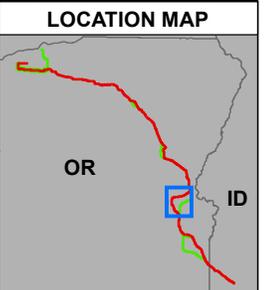
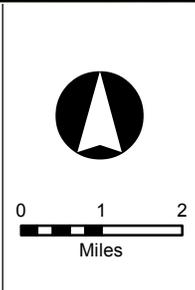


**FIGURE 7  
OCCUPIED PENDING LEKS 2012**  
**2012 GREATER SAGE-GROUSE SURVEY  
TECHNICAL REPORT**

BOARDMAN TO HEMINGWAY  
500KV TRANSMISSION LINE PROJECT  
OREGON-IDAHO  
OCTOBER 2012



- |   |                           |
|---|---------------------------|
| Waypoint  | Indian Reservation        |
| 2012 Survey Area                                | Bureau of Land Management |
| 2011 Survey Area                                | Bureau of Reclamation     |
| 2010 Survey Area                                | Department of Defense     |
| Proposed Route 20120301                         | Private                   |
| IPC Alternative 20120301                        | State                     |
| Milepost  | U.S. Forest Service       |
| New Occupied Pending Lek                        |                           |
| Oregon Occupied or Occupied Pending Status Leks |                           |



**APPENDIX A**  
**2012 SAGE-GROUSE SURVEY**  
**FLIGHT LOGS AND DATA SHEETS**

**2012 Sage-grouse Field Datasheet Summary Table.**

Date	Waypoint	GPS_ID	Male	Female	Unkn	Total	NAD83_UTM_E	NAD83_UTM_N	Photo_ID	Comments
4/5/2012	1	974	0	1	0	1	454446	4883774	1	1 female flushed
4/5/2012	2	975	0	1	0	1	454193	4886698	2	1 female flushed
4/5/2012	3	976	0	1	0	1	453348	4886454	3	1 female flushed
4/6/2012	4	1	3	0	0	3	450081	4892264	4	1 male strutting, flushed other 2 from same area
4/6/2012	5	2	2	0	0	2	451259	4893912	5	2 males flushed from same area
4/6/2012	6	3	0	1	0	1	448540	4893595	6	1 female flushed
4/6/2012	7	4	0	1	0	1	449874	4895436	7	1 female flushed
4/6/2012	8	5	0	1	0	1	448112	4894809	8	1 female flushed
4/6/2012	9	6	0	1	0	1	470164	4893808	9	1 female flushed
4/6/2012	10	7	6	0	5	11	469109	4900402	10	Flushed several grouse in area, count is a minimum
4/7/2012	11	9	3	1	1	5	470255	4901058	None	Likely associated with group flushed on 4/6 Obs_ID 10
4/7/2012	12	10	0	1	0	1	471662	4902647	None	1 female flushed
4/7/2012	13	11	0	1	0	1	472785	4901585	None	1 female flushed
4/12/2012	14	55	0	1	0	1	476744	4907981	None	1 female flushed during raptor surveys
4/12/2012	15	63	1	0	0	1	476186	4908910	None	1 male flushed during raptor surveys
4/13/2012	16	304	10	0	0	10	480207	4901520	11	Flushed 8-10 male grouse
4/13/2012	17	305	1	0	0	1	479056	4900364	12	Flushed 1 male
4/13/2012	18	306	0	1	0	1	472465	4902374	13	1 female flushed
4/13/2012	19	308	0	1	0	1	476142	4899981	None	1 female flushed
4/13/2012	20	309	0	1	0	1	471296	4900497	None	1 female flushed
4/13/2012	10	7	1	0	12	13	469109	4900402	10	1 male strutting, 7 other birds flushed from location, 5 additional birds flushed 0.3 miles to the north

**2012 Sage-grouse Field Datasheet Summary Table.**

Date	Waypoint	GPS_ID	Male	Female	Unkn	Total	NAD83_UTM_E	NAD83_UTM_N	Photo_ID	Comments
4/15/2012	6	3	0	1	0	1	448540	4893595	6	1 female flushed
4/15/2012	21	390	0	1	0	1	452322	4887777	14	1 female flushed
4/15/2012	22	391	0	1	0	1	454251	4886458	15	1 female flushed
4/15/2012	4	1	3	0	3	6	450081	4892264	4	3 strutting males, flushed 3 additional unclassified birds
6/7/2012	23	904	0	0	20	20	473222	4905843	None	Flushed large group of sage-grouse during raptor nest surveys

END Tach: 3252.9  
Begin Tach: 3250.3  
2.6

# DAILY FLIGHT LOG

Sunrise - 0724

Date: 4-3-12

Time Flight Started: 0708 Time Survey Started: 0731  
Time Survey Ended: 0737 Time Flight Ended: 0946  
Total Flight Hours: \_\_\_\_\_

Observer: Mike Schlegel  
Matt Cambien

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Start: 20/89 End: 40 1st Survey Area  
Start: 0-4 End: 5-10 0737 4A  
Start: 5-25 End: 26-50 0731  
2nd Survey Area  
Begin - 0741 4B  
END 0928

Area Surveyed: Begin map 4 - small Area  
4A - 107 Loops - 10 MD [4 MD - ±15 MD - 3 MD - ±30 MD  
4B - 6 Loops } 15 9 MD  
± 31 MD

Coyotes Observed: \_\_\_\_\_

Elk Observed: \_\_\_\_\_

Deer Observed: Total deer = 71 - 16 Antelope - 2 coyotes

Sage Grouse Observed: \_\_\_\_\_ Number  
(non-lek)

UTM's

Total Ferry = 45 min = .75  
Total Survey = 113 min = 1.88  
Total Time = 158 min = 2.63  
HAS

No Sage-grouse seen

Miscellaneous Wildlife Observations:

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

SUNRISE 00722

END Tach 55.7  
Begin Tach 52.9  
2.8

### DAILY FLIGHT LOG

Date: 4-5-12

Observer: Mike Schlegel  
Matt Cambria

Temperature (F): < 10; 10-19; 20-29; 30-39; > 40;  
Wind (MPH): 0-4; 5-10; 11-15; > 15;  
% Cloud Cover: 0-4; 5-25; 26-50; 51-75; > 75;

Time Flight Started: 0654  
Time Survey Started: 0712 (0830)  
Time Flight Ended: 0943  
Time Survey Ended: 0819 (0927)  
Total Flight Hours: 2.6

Start: 28, End: 30-39  
Start: 5-10, End: 5-10  
Start: 5-25, End: 5-25

Area Surveyed: Finish 4B - end 0819  
Area 2 - End 0927

Area 4B = 6 coyotes, 10 Deer  
Area 2 = 5 coyotes, 5 Deer

Coyotes Observed:

Elk Observed:

Deer Observed:

HTT (1,1,3)

9, 1 (6, 1, 1, 5, 12, 3, 10, 20)

Sage Grouse Observed: Number (non-lek)

UTM's

Photo 113

" 114 - Rd 1/2 mi W

" 119 Rd 1/4 mi E

all Area 2  
WP994 - Flushed 1 ♀  
Rd at site  
WP975 - Flushed 1 ♀  
976 " 1 ♀

#### Miscellaneous Wildlife Observations:

1 curlew - near pond.

1 "

1 GE - near stock pond.

2 curlew

1 GE - Area 2

1 "

Area 2

1 PP - area 2

Ferry Time = 45 min  
Survey Time = 124 min  
Total Time = 169 min  
2.82 hrs

Fuel Truck Miles: \_\_\_\_\_

Fuel Truck Driver Hours: \_\_\_\_\_

# DAILY FLIGHT LOG

Date: 4/6/2012

Time Flight Started: 0655

Time Survey Started:

Observers: MC  
JL'

Time Survey Ended: 0922

Time Flight Ended: 0937

Total Flight Hours: 2.8

Temperature (F): <10; 10-19; 20-29; 30-39; >40; Start: 29 End: 38

Wind (MPH): 0-4; 5-10; 11-15; >15; Start: 5-10 End: 11-15

% Cloud Cover: 0-5; 5-25; 25-50; 51-75; >75; Start: 0-5 End: 0-5

**Area Surveyed:**

Coyotes Observed: IIII	IIII
Elk Observed: _____	_____
Deer Observed: (13) (9) (3)	(2) (2) (1)

**Sage Grouse Observed (non-lek):** Number

UTM/GPS ID

1 F	2746 (3)
1 F	2750 (4)
1 F	2753 (5)
1 F	2848 (6)

**Miscellaneous Wildlife Observations:**

6 prairie-chicken

1

1 Burrowing Owl (2)

Date: 4/6 Observer: County/Mgmt Unit:

Time Flying Started: Time Survey Started:

Time Survey Ended: Time Flight Ended:

Lek Name ①

Time 7:25

UTM Coord. ①

Sky Conditions clear

Ground Conditions pasture in sage

Males 3 (1) admt

Females -

Unclassified

Total Birds 3

Directions to closest road Right next to observation. Road comes in from the north. Follows Game Creek up to then flat to corral.

Description of General Location Grass/pasture area near cattle corral.



Date: 4/6 Observer: County/Mgmt Unit:

Time Flying Started: Time Survey Started:

Time Survey Ended: Time Flight Ended:

Lek Name 2

Time 735

UTM Coord. (2)

Sky Conditions Clear

Ground Conditions low sage - rocky

Males 2

Females

Unclassified

Total Birds 2

Directions to closest road 1/4 to 1/2 mile SE - Road crosses Gun Clk on the way up to Thom Flak

Description of General Location



Date: 4/6 Observer: County/Mgmt Unit:

Time Flying Started: Time Survey Started:

Time Survey Ended: Time Flight Ended:

Lek Name 3

Time 0855

UTM Coord. (07)

Sky Conditions clear

Ground Conditions low sage / rocky

Males 6

Females

Unclassified 5

Total Birds 11

Directions to closest road - 2-track to east + south

- could be accessed via Lockett Rd from Simpson

Description of General Location

knob of hill in sage

wea's rocky

# DAILY FLIGHT LOG

Date: 4/7

Time Flight Started: 0658

Time Survey Started:

Observers: MC  
PF

Time Survey Ended: 0823

Time Flight Ended: 0835

Total Flight Hours: 1.6

Temperature (F): <10; 10-19; 20-29; 30-39; >40; Start: 12-19 End: 30-39

Wind (MPH): 0-4; 5-10; 11-15; >15; Start: 0-4 End: 5-10

% Cloud Cover: 0-5; 5-25; 25-50; 51-75; >75; Start: 0-5 End: 0-5

Area Surveyed:

Coyotes Observed: (1)(1)(2)(2)

Elk Observed:

Deer Observed: (3)(8)(0)(23)(6)

Sage Grouse Observed (non-lek): Number

UTM/GPS ID

1 F

010

1 F

011

Miscellaneous Wildlife Observations:

4 pronghorn

3 p

15 p



# DAILY FLIGHT LOG

SUN Rise - 0708 (MST)

Date: 4-13-12-1 Time Flight Started:

Time Survey Started: 0644

Observers: Mike Schlegel  
Matt Cambian Time Survey Ended:

Time Flight Ended: 0922

Total Flight Hours: 2.6

Temperature (F): <10; 10-19; 20-29; 30-39; >40; Start: 20/09 End: >40

Ferris Survey  
0644-0659 0659-0910

Wind (MPH): 0-4; 5-10; 11-15; >15;

Start: 0-4 End: 0-4

% Cloud Cover: 0-5; 5-25; 25-50; 51-75; >75;

Start: 05/00 End: 25/50

Area Surveyed: W of Huntington

Coyotes Observed: 9

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed (non-lek): Number UTM/GPS ID

Flushed - 8-10 - all ♂	304 - 7523	5/6
" 1 ♂	305 - 7524	5/6
" 1 ♀	306 - 7526	"
" 1 ♀	308 - 7528	"

Miscellaneous Wildlife Observations:

Coyote - 4 still, 1/1 (9)  
303 - curlew - IF - 5/6  
" 1 ♀ → 309 7529 - 6/5  
From previous [007 - flushed 8 birds - 1 strutting  
" 5 " To North

# DAILY FLIGHT LOG

SUN RISE - 0706

Date: 4-14-12-1

Time Flight Started: 0636 MOT

Time Survey Started: 0655 / 0809

Observers:

Mike Schlegel  
Matt Cambick

Time Survey Ended: 0758 / 0821

Time Flight Ended: 0838

Total Flight Hours: 2.0

Temperature (F): <10; 10-19; 20-29; 30-39; >40; Start: 50°F End: 55

Fenz      Survey  
0636-0655    0655-0758  
0758-0809    0809-0821

Wind (MPH): 0-4; 5-10; 11-15; >15;

Start: 11-15 End: >15

% Cloud Cover: 0-5; 5-25; 25-50; 51-75; >75;

Start: >75 End: >75

- 2.0 hr

Grouse

Area Surveyed: SAGE GROUSE

NE Huntington -  
NE Brogren

Coyotes Observed: 1, 1, 1, 1 = 5

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed (non-lek): Number

UTM/GPS ID

_____	_____
_____	_____
_____	_____
_____	_____

## Miscellaneous Wildlife Observations:

RT Juv 346-  
" " 347  
" " 348  
GE 349  
" 350

IF-5/G  
" "  
" "  
" "  
" "

- 0821 - called Sage G.  
Survey - Too windy -  
25-30 MPH

# DAILY FLIGHT LOG

SUNRISE - 0707 MDT

Date: 4-15-12

Time Flight Started: 0639

Time Survey Started: 0701 (0811)

Observers:

Milica Schlegel  
Matt Cambien

Time Survey Ended: 0801 (909)

Time Flight Ended: 0925

Total Flight Hours: 2.8

Temperature (F): <10; 10-19; 20-29; 30-39; >40; Start: 45°F End: 52°F

Wind (MPH): 0-4; 5-10; 11-15; >15;

Start: 10 End: 11-15

% Cloud Cover: 0-5; 5-25; 25-50; 51-75; >75;

Start: 5-75 End: 25-50

GROUSE  
2

Area Surveyed:

WP 4025 W - End Point  
WP 403 E " "

Coyotes Observed: 12 = 3

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

Sage Grouse Observed (non-lek): Number

UTM/GPS ID

1♀ Flushed 389 - (003 previous)

1♀ Flushed 390 - photo = 7640

1♀ " 391 " 7641

Miscellaneous Wildlife Observations:

388 - RT. JU IF - 5 off

NH - 392 - IF - 5 off / 6

" 393 - " " "

Fer 394 - Patch - FP - G/S

RT 395 - IF G/S

GE 396 - Flushed - 5

leu 397 - IF - 5/6

RT-Juv - 398 - Arch - R.

Nest-Fey. 399 - 7642

GE-2 - 400 - IF/Flush

GE-Juv 401 " S

Date: 4/15/12 Observer: County/Mgmt Unit:

Time Flying Started: Time Survey Started:

Time Survey Ended: Time Flight Ended:

Lek Name 001

Time 0729

UTM Coord.

Sky Conditions 50-75% cloud

Ground Conditions meadow

Males 3 strag

Females

Unclassified 3 unc. Flushes

Total Birds 6

Directions to closest road at site

Description of General Location see photo 7639

[Empty lines for additional notes]

Began at WP 402/403

# DAILY FLIGHT LOG

Sun Park - 0703 MDT

Date: 4-16-12

Time Flight Started: 0641

Time Survey Started: 0657 (092)

Observers:

Mike Schlegel  
Matt Cambria

Time Survey Ended: 0914 (092)

Time Flight Ended: 0942

Total Flight Hours: 3.0 hrs

2

Temperature (F): <10; 10-19; 20-29; 30-39; >40; Start: 40°F End: ±40°F

Wind (MPH): 0-4; 5-10; 11-15; >15; Start: 0-4 End: 5-10

% Cloud Cover: 0-5; 5-25; 25-50; 51-75; >75; Start: >75 End: >75

Area Surveyed:

Coyotes Observed: 1,1

Elk Observed: \_\_\_\_\_

Deer Observed: \_\_\_\_\_

*No Sage Grouse*

Sage Grouse Observed (non-lek): Number

UTM/GPS ID

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Miscellaneous Wildlife Observations:

**APPENDIX B**  
**2012 SAGE-GROUSE SURVEY**  
**WAYPOINT PHOTOGRAPHS**

### 2012 Sage-grouse Survey Waypoint Photo Log

Waypoint	Date	Photo #	NAD83-UTM-E	NAD83-UTM-N
1	4/5/2012	1	454446	4883774
2	4/5/2012	2	454193	4886698
3	4/5/2012	3	453348	4886454
4	4/6/2012	4	450081	4892264
5	4/6/2012	5	451259	4893912
6	4/6/2012	6	448540	4893595
7	4/6/2012	7	449874	4895436
8	4/6/2012	8	448112	4894809
9	4/6/2012	9	470164	4893808
10	4/6/2012	10	469109	4900402
11	4/7/2012	None	470255	4901058
12	4/7/2012	None	471662	4902647
13	4/7/2012	None	472785	4901585
14	4/12/2012	None	476744	4907981
15	4/12/2012	None	476186	4908910
16	4/13/2012	11	480207	4901520
17	4/13/2012	12	479056	4900364
18	4/13/2012	13	472465	4902374
19	4/13/2012	None	476142	4899981
20	4/13/2012	None	471296	4900497
10	4/13/2012	10	469109	4900402
6	4/15/2012	6	448540	4893595
21	4/15/2012	14	452322	4887777
22	4/15/2012	15	454251	4886458
4	4/15/2012	4	450081	4892264
23	6/7/2012	None	473222	4905843



Waypoint 1, April 5<sup>th</sup>.



Waypoint 2, April 5<sup>th</sup>.



Waypoint 3, April 5<sup>th</sup>.



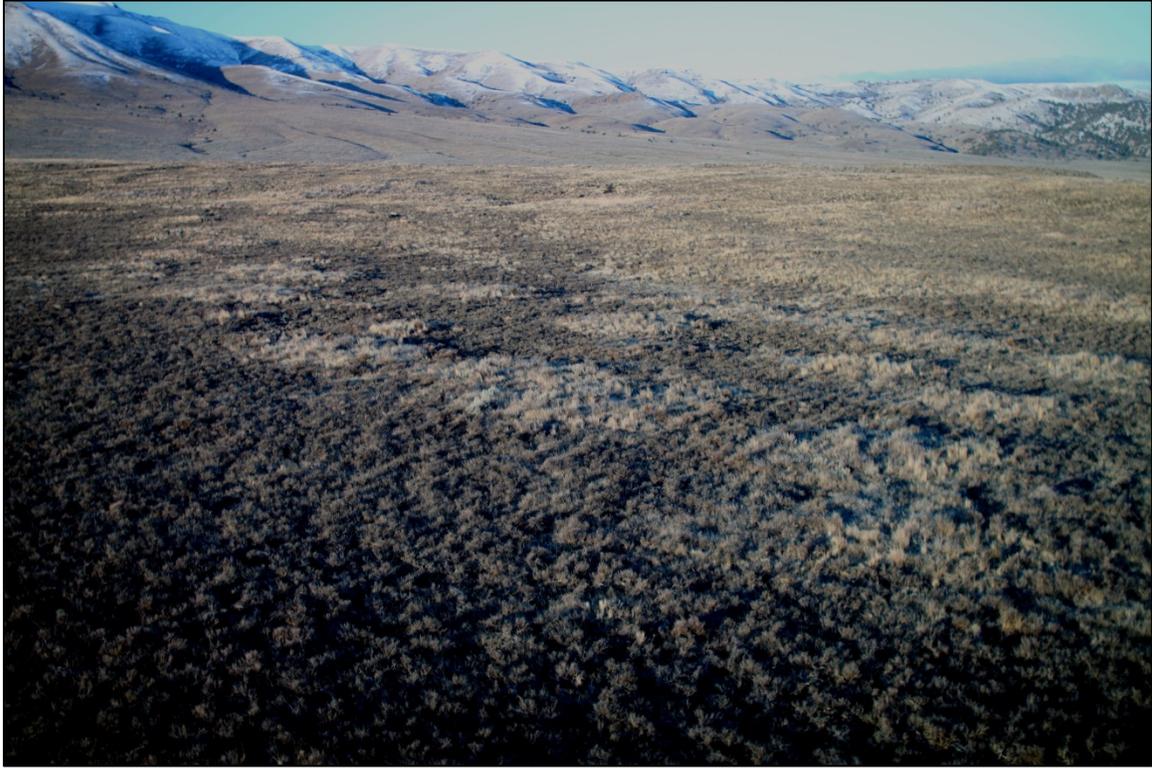
Waypoint 4, April 6<sup>th</sup> and April 15<sup>th</sup>.



Waypoint 5, April 6<sup>th</sup>.



Waypoint 6, April 6<sup>th</sup> and April 15<sup>th</sup>.



Waypoint 7, April 6<sup>th</sup>.



Waypoint 8, April 6<sup>th</sup>.



Waypoint 9, April 6<sup>th</sup>.



Waypoint 10, April 6<sup>th</sup> and April 13<sup>th</sup>.

No picture available.

Waypoint 11, Waypoint 12, and Waypoint 13, April 7<sup>th</sup>.

No picture available.

Waypoint 14 and Waypoint 15, April 12<sup>th</sup>.



Waypoint 16, April 13<sup>th</sup>.



Waypoint 17, April 13<sup>th</sup>.



Waypoint 18, April 13<sup>th</sup>.

No picture available.

Waypoint 19 and Waypoint 20, April 13<sup>th</sup>.



Waypoint 21, April 15<sup>th</sup>.



Waypoint 22, April 15<sup>th</sup>.

Waypoint 23, June 7<sup>th</sup>.

No picture available.