

Cameco
Swift Fox Den Survey
2011



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Appendix D9
Supplemental Information

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Introduction

Power Resources, Incorporated (d.b.a. Cameco Resources (Cameco)) is proposing to continue development of their in-situ uranium extraction operation in Converse County, Wyoming. The Smith Ranch-Highland-Reynolds Ranch In-Situ Recovery Project will consist of combined Wyoming Department of Environmental Quality-Land Quality Division (WDEQ-LQD) permits #603 and #633. In order to comply with federal and state regulations, prior to continued development the Wyoming Game and Fish Department (WGFD) has requested that the following wildlife or habitat indicator surveys be conducted: Swift fox (*Vulpes velox*) den site surveys within the combined permit area. Cameco contracted Grouse Mountain Environmental Consultants (GMEC) to conduct the above mentioned surveys.

Project Area Description

The 39,870-acre Smith ranch-Highland-Reynolds Ranch Permit Area (Permit Area) of Power resources, Incorporated (Cameco) is located in the Highland Flats area of the southern Powder River Basin in Converse County, Wyoming. The Permit Area is located approximately 25 miles north-northwest of Douglas and 22 miles northeast of Glenrock, Wyoming (T37N:R74W, Sections 25,26,35,36; T37N:R73W, Sections 30-32; T36N:R74W, Sections 1, 2, 11-14, 22-27, 33-36; T36N:R73W, Sections 5-7, 10-31, 34-36; T36N:R72W, Sections 7, 16-22, 29, 30; T35N:R75W, Sections 13, 24; T35N:R74W, Sections 2-5, 8-11, 14-19, 21). Elevations across the Permit Area ranges from approximately 5,000 to 5,800 feet and is gently sloping sagebrush and grassland range with shallow drainages and rolling hills. This area has cold winters and hot summers. Average annual precipitation is about 12 inches per year, with most of the moisture coming in late spring and early summer. The Permit Area is located primarily on private land, but the area is a combination of federal, private, and state lands with federal and state lands occupying a small part of the total Permit Area. This area is a part of the Northwestern Great Plains and is classified as a mixed-grass prairie with a mix of species from both the short and tall grass prairies, additionally influences by the northern desert shrub system. The dominant vegetation types in the Permit Area are mixed sagebrush/grassland and grassland, with disturbed hay meadows, impoundments, cottonwood/willow, playas, shelterbelts, and reclaimed lands.




Swift Fox Den Site Survey


Den Site Description

Dens are usually located in short-grass and mixed-grass prairie, but have been found in cultivated dryland wheat fields or other human-made habitats. They are built on sloping plains, hilltops, or other well-drained sites. Swift foxes prefer sites with loamy soils, where dens are easily dug. Claylike soils are difficult to dig and are avoided by swift foxes. Swift foxes will excavate their own dens or enlarge burrows of ground squirrels, prairie dogs, badgers, or other animals. Dens can be located by looking for mounds of earth in front of each entrance. Entrances are circular or keyhole in shape, approximately 7 to 9 inches in diameter, and there may be more than one entrance to a given den. Pup-rearing dens have numerous entrances, whereas, dens used to escape from predators frequently have only one opening.

Methods



WGFD does not have a standard survey protocol for locating den sites, however, WGFD Non-game biologist Luarie Van Fleet recommended conducting a minimum of two spotlight surveys on consecutive nights before September 15th as the pups begin to disperse from the den sites around this time (personal communication). Due to the foxes mostly nocturnal behavior spotlight surveys were conducted between ½ hour after sunset until 3 AM. The surveys were conducted by slowly driving existing improved and existing two-track roads throughout the project area while shining a spotlight in order to locate eye shine of any foxes present. In addition to spotlight surveys GMEC conducted ground surveys in Cameco's proposed mine units (Figure 1) in order to concentrate searches for den sites within proposed future development areas. The ground surveys were conducted on foot during daylight hours in areas containing suitable habitat for swift fox den sites. A global positioning system (GPS) receiver, using North American Datum (1983) and Universal Trans Mercator (UTM) coordinates in Zone 13, and a digital camera will be used to record den locations or other relevant wildlife associated features discovered during the swift fox den surveys.




Results


During the two consecutive nights of spotlight surveys no swift fox or swift fox dens were located. Eighteen (18) proposed mine units searched on foot during daylight hours to search for swift fox den sites. During the searches several burrows/dens of suitable size and in suitable habitat were located. However, these locations lacked any diagnostic sign that would suggest the sites are currently being used or have been used by swift fox. During daylight den searches of proposed mine unit #3 (Figure 1) a dirt road was located that had a large amount of swift fox tracks indicating the area is being used by a swift fox. In addition to the fox tracks a suitable sized hole was located near the road that could potentially serve as a swift fox den (Appendix 1-Photos). Although the location demonstrates characteristics of a swift fox den and dirt had recently been removed from the hole no other sign was located near the burrow that would suggest it is currently being used by swift fox. Additionally, no swift fox were located in the area during two consecutive nights of spotlighting.



Conclusions

Swift foxes typically prefer short- or mixed-grass prairie with flat to gently rolling terrain and low-growing sparse vegetation that allows for good mobility and visibility. Habitats within the short-grass and mixed-grass prairie ecosystems are able to provide the essentials for swift fox survival. These essentials include a diverse prey base, topography that allows long viewing distances to detect predators, and firm, friable soils suitable for dens. Swift foxes tend to avoid areas of dense shrubs and tall vegetation, which, because of their small size, limit their vision and movements. The majority of the project area contains suitable habitat for swift fox life history requirements. No swift fox or swift fox dens were located during the nighttime spotlight searches within the project area including the proposed mine units. Eighteen proposed mine units totaling 1,960 acres were searched on foot during daylight hours in order to increase the chance to locate swift fox den sites in areas proposed for future development. Although all of the proposed mine units contained burrows and one of the proposed mine units had swift fox sign in it no sites were located that could conclusively be determined as swift fox den sites. Because the majority of the project area is suitable swift fox habitat and diagnostic sign was located in





one of the proposed mine units GMEC recommends that swift fox surveys be conducted on a yearly basis and before a mine unit is developed.



Literature Cited / References

Marks, Raissa. 2005. Swift Fox (*Vulpes velox*). Fish and Wildlife Habitat Management Leaflet Number 33.

Van Fleet, Luarie. Wyoming Game and Fish Non-game Biologist. Personal Communication. 2011

Qualifications

Zach Byram, Grouse Mountain Environmental Consultants, conducted field surveys and is the author of this report.

Zach Byram holds a B.S. in Wildlife and Fisheries Biology and Management (2001) from the University of Wyoming. He is currently a Wildlife Biologist with Grouse Mountain Environmental Consultants based in Buffalo, Wyoming. Mr. Byram has 10 years of combined professional experience with federal, state, and research agencies as well as the oil and gas industry. His direct work experience includes applied field work and research with federal and state agencies including the U.S. Forest Service, USDA National Wildlife Research Center, and Montana Fish, Wildlife, and Parks. Mr. Byram has a diverse biological survey background that includes avian, small mammal and fisheries surveys that focused on Peregrine falcon, Pileated Woodpecker, Northern Goshawk, American pine marten, Black-tailed Prairie Dog, and fluvial Arctic grayling. He has also performed vegetation sampling in compliance with state and federal regulations. In addition, his wildlife interests have allowed him to participate in Grey wolf trapping efforts and elk immobilization efforts to assist in the research of Chronic Wasting Disease.

Figure 1

Cameco Swift Fox Survey Map

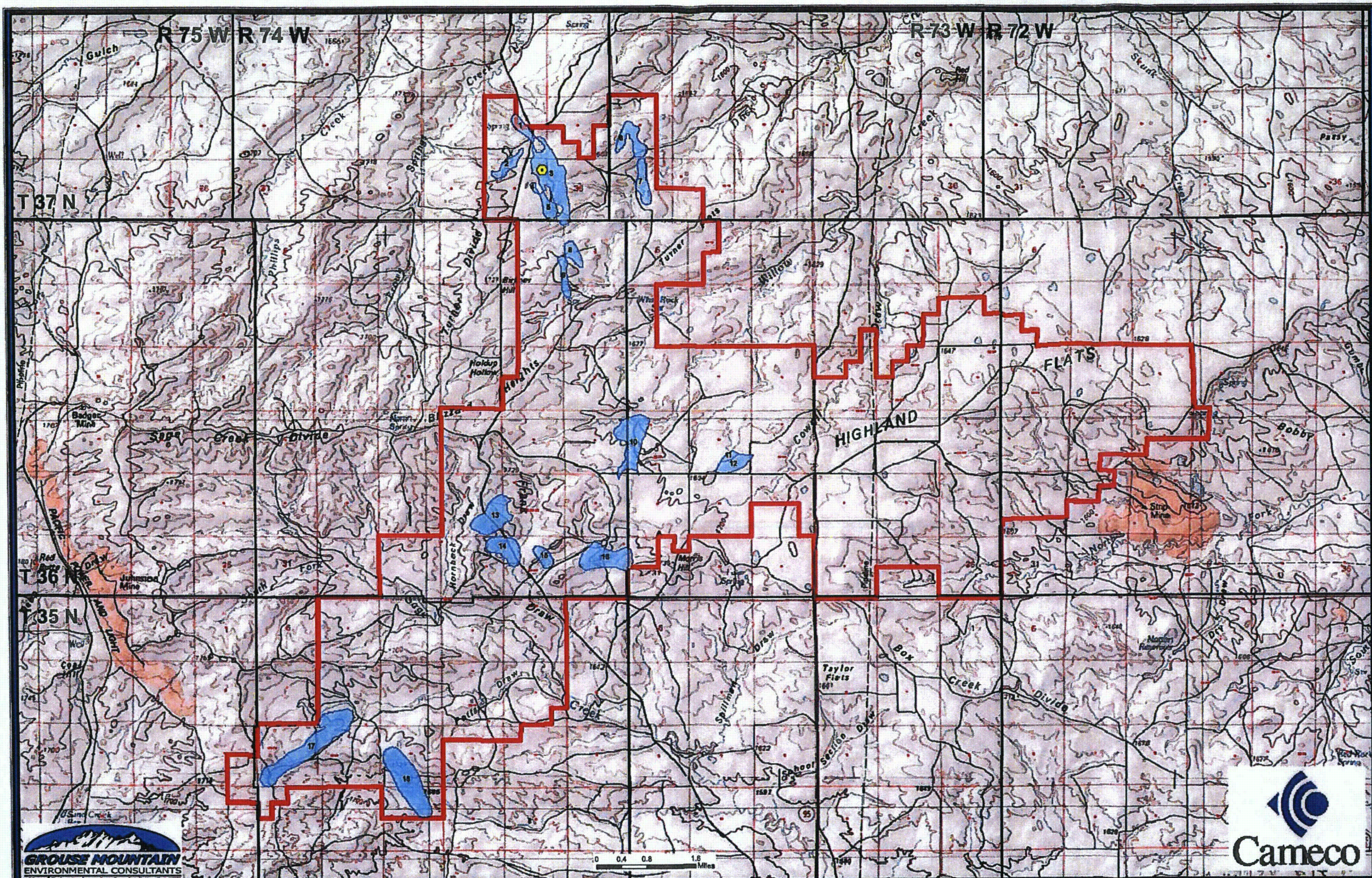


Figure 4. Smith Ranch-Highland-Reynolds Ranch In-Situ Uranium WDEQ-LDQ Permit #633: Swift Fox Surveys 2011

- Smith Ranch-Highland-Reynolds Ranch Project Boundary
- Proposed Mine Units
- Potential Swift Fox Den



Johnson

Coordinate System: UTM meters

Projection: NAD 83 Zone 13N

Scale: 1:65000

Created By: ZJB

Date: 05/01/11

Filename: 9110_Cameco_SwiftFox

USGS Quad ID

Campbell

Appendix 1

Photos

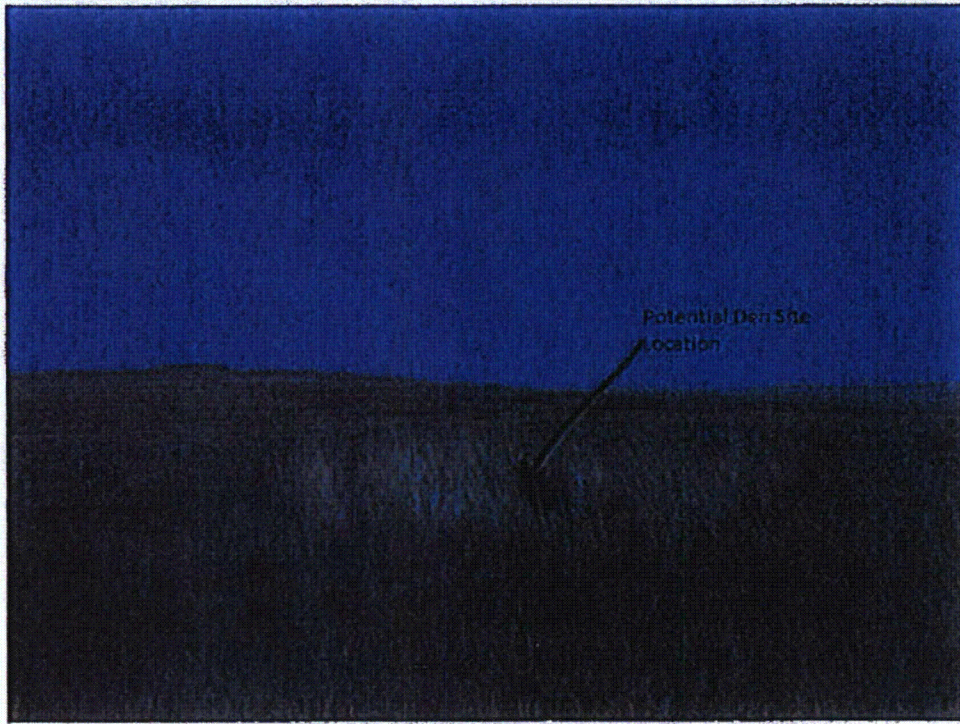




Potential Den Site Photo#1



Potential Den Site Photo#2



Potential Den Site Location

Smith Ranch-Highland/Reynolds Ranch In-Situ Uranium Recovery Project

2011 Wildlife Survey Report



Cameco

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**Appendix D9
Supplemental Information**

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FIGURES

FIGURE 1. Locations of sage-grouse leks, raptor nests and wetland/pond monitoring sites in and around the Smith Ranch-Highland/Reynolds Ranch Permit Area.

INTRODUCTION

Power Resources, Incorporated (d.b.a. Cameco Resources (Cameco)) is proposing to continue development of their in-situ uranium extraction operation in Converse County, Wyoming. The Smith Ranch-Highland/Reynolds Ranch In-Situ Recovery Project will consist of combined Wyoming Department of Environmental Quality-Land Quality Division (WDEQ-LQD) permits #603 and #633. In order to comply with federal and state regulations, prior to continued development, the US Fish and Wildlife Service (USFWS) and Wyoming Game and Fish Department (WGFD) have requested that the following wildlife surveys be conducted: two ground count surveys of greater sage-grouse (*Centrocercus urophasianus*) on the known leks and any new leks discovered, two ground surveys for raptor nests within one mile of the project area and black-tailed prairie dog (*Cynomys ludovicianus*) presence/activity surveys and mapping. In addition to these surveys, monthly wetland/pond monitoring will be conducted to monitor presence and use of wetland areas by wildlife, especially associated waterfowl and shorebirds. In addition to these surveys, Cameco will document any opportunistic observations of animals classified as "Target Species". The target species were identified using two lists. These are:

- 1) Species designated as Threatened or Endangered, Proposed Species, Candidate Species, or Species of High Federal Concern by the USFWS; and
- 2) Species designated as species of concern by the WGFD that area known to occur or are likely to occur within two miles of the combined Permit Area.

The target species are either known to occur or are likely to occur within 2-miles of the Permit Area. The target species for the Permit Area include; black-tailed prairie dog, swift fox (*Vulpes velox*), certain bat species, small rodents including Ord's kangaroo rat (*Dipodomys ordii*), thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*), olive-backed pocket mouse (*Perognathus fasciatus*), northern grasshopper mouse (*Onychomys leucogaster*), sagebrush vole (*Lemmyscus curtatus*), least chipmunk (*Neotamias minimus*), yellow-pine chipmunk (*Neotamias amoenus*), deer mouse (*Peromyscus maniculatus*), greater sage-grouse, mountain plover (*Charadrius montanus*), raptors including bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), burrowing owl (*Athene cunicularia*), merlin (*Falco columbarius*), short-eared owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), peregrine falcon (*Falco peregrinus*), and reptiles/amphibians.

PROJECT AREA

The 39,870-acre Smith Ranch Highland/Reynolds Permit Area of Cameco is located in the Highland Flats area of the southern Powder River Basin in Converse County, Wyoming. The combined Permit Area is located approximately 25 miles north-northwest of Douglas and 22 miles northeast of Glenrock, Wyoming (T37N:R74W, Sections 25, 26, 35, 36; T37N:R73W, Sections 30-32; T36N:R74W, Sections 1, 2, 11-14, 22-27, 33-36; T36N:R73W, Sections 5-7, 10-31, 34-36; T36N:R72W, Sections 7, 16-22, 29, 30; T35N:R75W, Sections 13, 24; T35N:R74W, Sections 2-5, 8-11, 14-19, 21). Elevation across the combined Permit Area ranges from approximately 5,000 to 5,800 feet and is gently sloping sagebrush and grassland range with shallow drainages and rolling hills. This area has characteristically cold winters and

correspondingly hot summers. Average annual precipitation is about 12 inches per year, with most of that coming in late spring to early summer. The combined Permit Area is located primarily on private land holdings, but the area is a combination of federal, private, and state lands with federal and state lands occupying less than 10 percent of the total acreage.

This area is a part of the Northwestern Great Plains and is classified as a mixed-grass prairie with a mix of species from both the short and tall grass prairies, additionally influenced by the northern desert shrub system. The dominant vegetation types in the combined Permit Area are mixed sagebrush/grassland and grassland, with disturbed land, hay meadows, impoundments, cottonwood/willow stands, playas, shelterbelts and reclaimed lands.

SURVEY METHODS

Wildlife data collected by Grouse Mountain Environmental Consulting (GMEC) and Hayden-wing Associates (HWA) along with WGFD database records were used to help perform surveys. Wildlife surveys were conducted following USFWS, BLM and WGFD survey protocols (USFWS 2011, BLM 2011, and WGFD 2007). Surveys were performed from 4x4 truck, ATV, or foot, depending on the species monitored. Data was collected using handheld Trimble® Juno SB facilitated with ArcPad® GIS software. Binoculars, spotting scope, topographic maps and varied field guides assisted in the observation and identification of wildlife in the area.

GREATER SAGE-GROUSE

Methods

Surveys were conducted in addition to one aerial survey and one ground count survey performed by GMEC for Cameco earlier in the survey season. Four documented leks occur within the 2 mile Permit Area buffer. Two ground count surveys were conducted at the Sand Creek 2 and Turner Divide leks to determine the maximum number of birds using the lek. The North 95 and North 95 East leks were unable to be surveyed due to land owner constraints. Surveys were conducted between 0600 and 0800 hours on April 28, and May 5, 2011. Leaks were observed with binoculars or spotting scopes from a truck for approximately 15 minutes. Data collected during surveys at each lek location included maximum number of birds, activity, and sex of observed birds. Leaks were classified as "active" if strutting males or sign (feathers, scat, or prints) were observed during any of the surveys.

Results

The Sand Creek 2 lek was confirmed to be active during the 2011 ground surveys as 6 males were observed strutting on April 28, and 7 males were observed strutting on May 5 (Table 1). The Turner Divide lek was documented as inactive during the 2011 ground surveys (Table 1). The coordinates for the Turner Divide lek place the lek location in typically unsuitable sage-grouse habitat and an unsuitable lek location. Additionally, notes made in 2008 indicate that the lek may not exist anymore.

RAPTORS

Methods

Ground surveys were performed in addition to an aerial survey conducted May 13, 2011 by GMEC. Surveys were conducted in and within one mile of the Permit Area. A ground survey was conducted June 3, 2011 to determine the productivity of early nesting raptors located during the aerial survey and to determine the activity of nests not located during the aerial survey. A second ground survey was conducted July 5, 2011 to determine the productivity of documented active nests. A third ground survey was conducted to determine the productivity of late nesting raptor species. The locations of raptor nests were recorded and located using GPS equipment and USGS topographic maps. The nest status, condition, substrate, and species of raptor using the nest were documented.

Nests were observed from a distance, using binoculars or spotting scopes to avoid disturbing nesting birds and to determine whether or not an adult bird was present on or in the vicinity of the nest. If an adult was present, the biologist remained at a distance and attempted to determine the age and number of young in the nest. If it was determined that no adult birds were present, the areas under, around, and if possible in, the nests were searched for signs of recent activity (fresh mute, regurgitated pellets, eggs, eggshell fragments, prey remains, etc.).

Fourteen species of raptor are reported to occur in the Permit area as well as four additional species that could potentially use the Permit Area. Eight of these are target species because they are on the WGFD species of concern list, are protected under the Bald and Golden Eagle Protection Act (16 U.S.C 668), or are protected under the Migratory Bird Treaty Act (16 U.S.C 703). The eight target species on the WGFD species of concern list are the bald eagle, golden eagle, ferruginous hawk, burrowing owl, merlin, short-eared owl, Swainson's hawk, and the peregrine falcon.

Results

There are 48 raptor nest sites documented in and within one mile of the Smith Ranch-Highland/Reynolds Ranch Permit Area (Table 2, Figure 1). These included four red-tailed hawk (*Buteo jamaicensis*) nests, two golden eagle nests, 11 ferruginous hawk nests, eight Swainson's hawk nests, and 7 nests of unknown raptor species. 16 nests had deteriorated beyond use and were confirmed gone.

10 nests were found to be active during ground surveys and 22 were found to be inactive. 6 nests produced young (5, 7, 11, 17, 57, and 60). 4 nests failed 9, 15, 27, and 39.

Failed nest #9 was observed with a Swainson's hawk in the incubating position during the survey on June 3. On the follow up survey on July 5, there were no adults present and no chicks observed. The nest is located approximately 60 yards away from the main entrance to the mine office. Opportunistic observations of the nest also showed continual harassment from nearby passerine birds. Failed nest #15 was observed with a Swainson's hawk in the incubating position

during the June 3, 2011 survey. On the follow up survey July 5, 2011 there were no adults present and no chicks observed, further investigation revealed 2 intact eggs in the nest. Lack of whitewash, prey remnants and feathers at the nest confirmed a nest failure. Failed nest #27 was observed with a Swainson's hawk in the incubating position during the June 3, survey. On the follow up survey July 5, 2011 there were no adults present and no chicks observed. Further investigation revealed the nest had been damaged by wind and much of the nesting material and egg shells were lying on the ground under the tree. Failed nest #39 was observed with a Swainson's hawk in the incubating position during the survey on June 3, 2011. On the follow up survey on July 5, 2011 two adults were nearby and showing defensive behavior but there was no activity at the nest and no chicks observed. Lack of whitewash, prey remnants and feathers at the nest suggest a possible nest failure. The surrounding area was searched for an alternative nest, but no nest was located. A follow up survey was conducted on August 8, 2011 and was confirmed failed due to no adult activity or chicks observed at or near the nest.

BLACK-TAILED PRAIRIE DOG

Methods

Previous wildlife survey reports and WGFD database inquiries were made in order to determine locations of black-tailed prairie dog colonies within the permit area. Prairie dog colonies were opportunistically searched for while performing other wildlife surveys. Also if landowner contacts were made, prairie dog colony presence and locations were discussed.

Results

No black-tailed prairie dog colonies were determined to be present in the permit area through a review of previous wildlife reports and WGFD records. Landowner contacts and opportunistic observations also determined there is no black-tailed prairie dog colonies present in the permit area.

WETLAND/POND MONITORING

Methods

The USFWS expressed concerns regarding selenium concentrations in wastewater produced during the in-situ uranium mining process. Mitigation efforts were set to monitor wildlife use of wastewater storage and disposal sites, more specifically waterfowl and shore bird use. A purge storage reservoir, pivot irrigation field and settling ponds were monitored for wildlife use. No specific standard protocol was utilized while conducting wetland and pond monitoring. Wildlife observations were conducted monthly during daylight hours using binoculars and spotting scopes. Observation points were chosen based on access and visibility. Each location was systematically scanned until the entire visible area was thoroughly searched and all wildlife observations were documented. If necessary, multiple observation points were used to ensure that the entire location was scanned. The amount of time spent at each location varied and was dictated by the size of the location and the number of species present.


Results

Three different locations within the permit area were monitored on seven occasions; Purge storage reservoir 2 (PSR-2) (wetland/pond monitoring site #1), PSR-2 pivot irrigation field (wetland/pond monitoring site #14) and two lined settling ponds (wetland/pond monitoring site #11). Locations of these sites can be found in Figure 1. A total of 15 aquatic bird species, 15 other avian species and 1 mammalian species were observed during surveys. Wildlife observed during wetland/pond monitoring surveys are listed in Table 3.

Site 1 is approximately 20 acres in size and was the only site where waterfowl and shore birds were observed. Waterfowl and shore birds were observed feeding on or near the bank and shallower portions of the reservoir. Although not a waterfowl or shorebird species, red-winged blackbirds (*Agelaius phoeniceus*) and barn swallows (*Hirundo rustica*) were observed frequently feeding and showing courtship displays during surveys. Other avian species were observed with little activity and quick intermittent visits. During the September survey six mule deer (*Odocoileus hemionus*) were observed feeding approximately 40 yards from the shore of the reservoir. During the December survey no wildlife observations were made partially due to the time of year and the reservoir was frozen.

Site 11 is approximately 0.8 acres and is fenced in and contains no aquatic vegetation. No waterfowl or shorebird species were observed at this site. Other avian species were observed feeding on insects around the edges and berms of the two ponds. The west pond contained little to no water in the majority of the surveys. No wildlife was observed in October, November and December surveys. The east pond was frozen during the December survey.

Site 14 is approximately 124 acres. No waterfowl or shorebird species were observed at this site. Other avian species were observed feeding on insects on two track roads. Two raptor species were observed; a northern harrier (*Circus cyaneus*) was observed flying low and hunting over the field and a rough-legged hawk (*Buteo lagopus*) was seen perched on the pivot irrigation piping. Mule deer were observed feeding during June, July and November Surveys. No wildlife observations were made during the October survey.



Literature Cited

Wyoming Game and Fish Department. 2007. Handbook of Biological Techniques Third Edition. Wyoming Game and Fish Department Cheyenne, WY. Chapters 12, 19.

U.S. Fish and Wildlife Service Wyoming Ecological Services. 2011. Species of Concern, Raptors in Wyoming.
http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html

Bureau of Land Management. 2011. Wildlife Survey Protocols. Wyoming High Plains District -- Newcastle Field Office. Newcastle, WY.
<http://www.blm.gov/pgdata/etc/medialib/blm/wy/field-offices/newcastle/wildlife/docs.Par.53483.File.dat/SurveyProtocols.pdf>

Table 1. Sage-grouse lek surveys conducted within 2 miles of the Smith Ranch-Highland/Reynolds Ranch Permit Area.

Sand Creek 2

Lek Status	Date	Survey Method	Time	Males	Females	QQ	Sec.	Twn	Rng	Easting	Northing
Active	4/28/2011	Ground	0600	6	1	SWSE	15	35	75	431649	4761132
	5/5/2011	Ground	0600	7	1						

Turner Divide

Lek Status	Date	Survey Method	Time	Males	Females	QQ	Sec.	Twn	Rng	Easting	Northing
Inactive	4/28/2011	Ground	0630	0	0	NESW	9	36	74	439500	4772900
	5/5/2011	Ground	0630	0	0						

Table 2. Raptor nest surveys conducted within one mile of the Smith Ranch-Highland/Reynolds Ranch Permit Area.

Nest Number (HWA ID)	Survey Dates	2011 Nest Status ¹	Species Code ²	Nest Structure ³	Nest Condition	Nest Productivity ⁴	Coordinates		Legal Location			
							UTM E	UTM N	QQ	S	T	R
5	6/3, 7/5, 8/8/2011	ACTI	SWHA	WIL	GOOD	2-Class II young	441931	4764563	NESE	3	34	74
6	6/3/2011	INAC	UNRA	CTL	GOOD		440722	4763194	NWSW	10	35	74
7	6/3, 7/5/2011	ACTI	RETA	CTL	EXCELLENT	2-Class III young	442624	4763494	NENW	11	35	74
8	6/3/2011	INAC	UNRA		GONE		443132	4763660	NWNE	11	35	74
9	6/3, 7/5/2011	ACTF	SWHA	BOX	FAIR	Abandoned	443982	4766958	NENW	36	36	74
10	6/3/2011	INAC	UNRA		GONE		444292	4766838	NENW	36	36	74
11	6/3, 7/5, 8/8/2011	ACTI	SWHA	ELM	GOOD	2-Class II young	446296	4768463	NWNE	30	36	73
12	6/3/2011	INAC	UNRA	ELM	FAIR		446439	4768523	NENE	30	36	73
13	6/3/2011	INAC	UNRA		GONE		449810	4768840	SESE	21	36	73
14	6/3/2011	INAC	UNRA		GONE		449961	4768930	SWSW	22	36	73
15	6/3, 7/5/2011	ACTF	SWHA	ELM	GOOD	Abandoned-2 eggs left in nest	449348	4769941	SWNE	21	36	73
16	6/3/2011	INAC	UNRA	ELM	FAIR		452752	4770555	SWSE	14	36	73
17	6/3, 7/5, 8/8/2011	ACTI	SWHA	ELM	GOOD	2-Class I young	452835	4770615	SESE	14	36	73
18	6/3/2011	INAC	UNRA	CTL	GOOD		455689	4770287	NENW	19	36	72
19	6/3/2011	INAC	UNRA	CTL	GONE		455578	4768533	NENW	30	36	72
20	6/3/2011	INAC	RETA	CTL	FAIR		456197	4768717	NENE	30	36	72
21	6/3/2011	INAC	UNRA		GONE		456289	4768634	NENE	30	36	72
22	6/3/2011	INAC	UNRA		GONE		440137	4767032	NENE	33	36	74
24	6/3/2011	INAC	RETA	CTL	FAIR		435798	4764644	NWSW	6	35	74
25	6/3/2011	INAC	UNRA		GONE		441377	4762658	SWSE	10	35	74
26	6/3/2011	INAC	UNRA		GONE		439739	4763016	NWSE	9	35	74
27	6/3, 7/5/2011	ACTF	SWHA	WIL	POOR	Nest damaged-egg shells on ground	440819	4759937	NESW	22	35	74
28	6/3/2011	INAC	UNRA	WIL	POOR		439585	4765881	SWSE	33	36	74
29	6/3/2011	INAC	UNRA		GONE		442500	4763441	SENW	11	35	74
30	6/3/2011	INAC	UNRA		GONE		449485	4769807	SWNE	21	36	73

Nest Number (HWA ID)	Survey Dates	2011 Nest Status ¹	Species Code ²	Nest Structure ³	Nest Condition	Nest Productivity ⁴	Coordinates		Legal Location			
							UTM E	UTM N	QQ	S	T	R
31	6/3/2011	INAC	UNRA		GONE		442827	4764125	SWSE	2	35	74
35	6/3/2011	INAC	RETA	CTL	FAIR		445006	4776561	NWNW	31	35	73
37	6/3/2011	INAC	UNRA	CTL	FAIR		442156	4779433	SENW	23	35	74
39	6/3, 7/5, 8/8/2011	ACTF	SWHA	ELM	FAIR	Unknown cause	441597	4777808	SWNW	28	35	74
40	6/3/2011	INAC	FEHA	ROK	EXCELLENT		443534	4776303	SWNW	36	35	74
41	6/3/2011	INAC	FEHA	ROP	POOR		443838	4775839	NESW	36	35	74
42	6/3/2011	INAC	GOEA	CTL	EXCELLENT		451674	4773731	SWSW	2	36	73
43	6/3/2011	INAC	FEHA	ROP	EXCELLENT		445705	4773083	SENW	7	36	73
44	6/3/2011	INAC	FEHA	ROP	GOOD		448576	4772112	SWSW	9	36	73
45	6/3/2011	INAC	FEHA	GHS	GOOD		446829	4771477	SWNE	17	36	73
46	6/3/2011	INAC	FEHA	GHS	FAIR		445305	4770289	NWNW	19	36	73
47	6/3/2011	INAC	UNRA	ELM	FAIR		448290	4770708	SESE	17	36	73
48	6/3/2011	INAC	UNRA		GONE		449865	4769610	SENE	21	36	73
49	6/3/2011	INAC	UNRA		GONE		443388	4774563	SENE	2	36	74
50	6/3/2011	INAC	FEHA	ROK	REMNANTS		443661	4773280	NWNW	12	36	74
51	6/3/2011	INAC	FEHA	ROK	FAIR		441171	4773014	SENW	10	36	74
56	6/3/2011	INAC	FEHA	ROK	FAIR		439863	4769515	NWSE	21	36	74
57	6/3, 7/5, 8/8/2011	ACTI	SWHA	WIL	EXCELLENT	1-Class I young	440809	4768334	SENW	27	36	74
58	6/3/2011	INAC	FEHA	GHS	GOOD		444524	4770283	NWNE	24	36	74
59	6/3/2011	INAC	UNRA		GONE		441305	4778716	SESE	22	35	74
60	6/3, 7/5/2011	ACTI	GOEA	CTL	EXCELLENT	1-Class III young	451800	4773049	SWNW	11	36	73
61	6/3/2011	INAC	UNRA		GONE		451038	4770280	NWNE	22	36	73
62	6/3/2011	INAC	FEHA	GHS	FAIR		446479	4773176	SESE	7	36	73

¹ ACTI = Active; INAC = Inactive; ACTF = Active nest failed to produce young to fledgling age

² FEHA = Ferruginous Hawk; GOEA = Golden Eagle; RETA = Red-tailed Hawk; SWHA = Swainson's Hawk; UNRA = Unknown Raptor

³ WIL = Willow; CTL = Cottonwood-Live; ELM = Elm; ROK = Rock Outcrop; ROP = Rock Pillar; GHS = Ground/Hill Side; BOX = Boxelder

⁴ Class I = All downey/no feathers; Class II = Feathers visible/downey patches on body or head; Class III = Completely feathered

Table 3. List of species observed using wetland/pond sites during seven monthly surveys within the Smith Ranch-Highland/Reynolds Ranch Permit Area.

Wetland/Pond Monitoring Site #1

Survey Date	Species Observed
6/27/2011	Red-winged Blackbird, Brewer's Blackbird, Killdeer, Common Nighthawk, Barn Swallow, Horned Lark, Wilson's Phalarope, Mourning Dove, Vesper Sparrow, Western Meadowlark
7/22/2011	Barn Swallow, Lark Bunting, Brewer's Blackbird, Killdeer, Western Meadowlark, Common Nighthawk, Eared Grebe, Eastern Kingbird, Red-winged Blackbird, Vesper Sparrow, Great Blue Heron
8/23/2011	Killdeer, Eared Grebe (7), Western Meadowlark, Lark Sparrow, Barn Swallow, Horned Lark
9/21/2011	American Coot (~40), Northern Shoveler (~15), Lesser Scaup (~10), Green-winged Teal (~30), Killdeer, Mule Deer (6), Great Blue Heron (2), Horned Grebe, Northern Harrier, Yellow-headed Blackbird
10/18/2011	Western Grebe (2), Ring-necked Duck (~12), Bufflehead (4), Blue-winged Teal (6), American Coot (6), American Wigeon (4), Eared Grebe (4)
11/15/2011	Mallard (10)
12/16/2011	No Observations

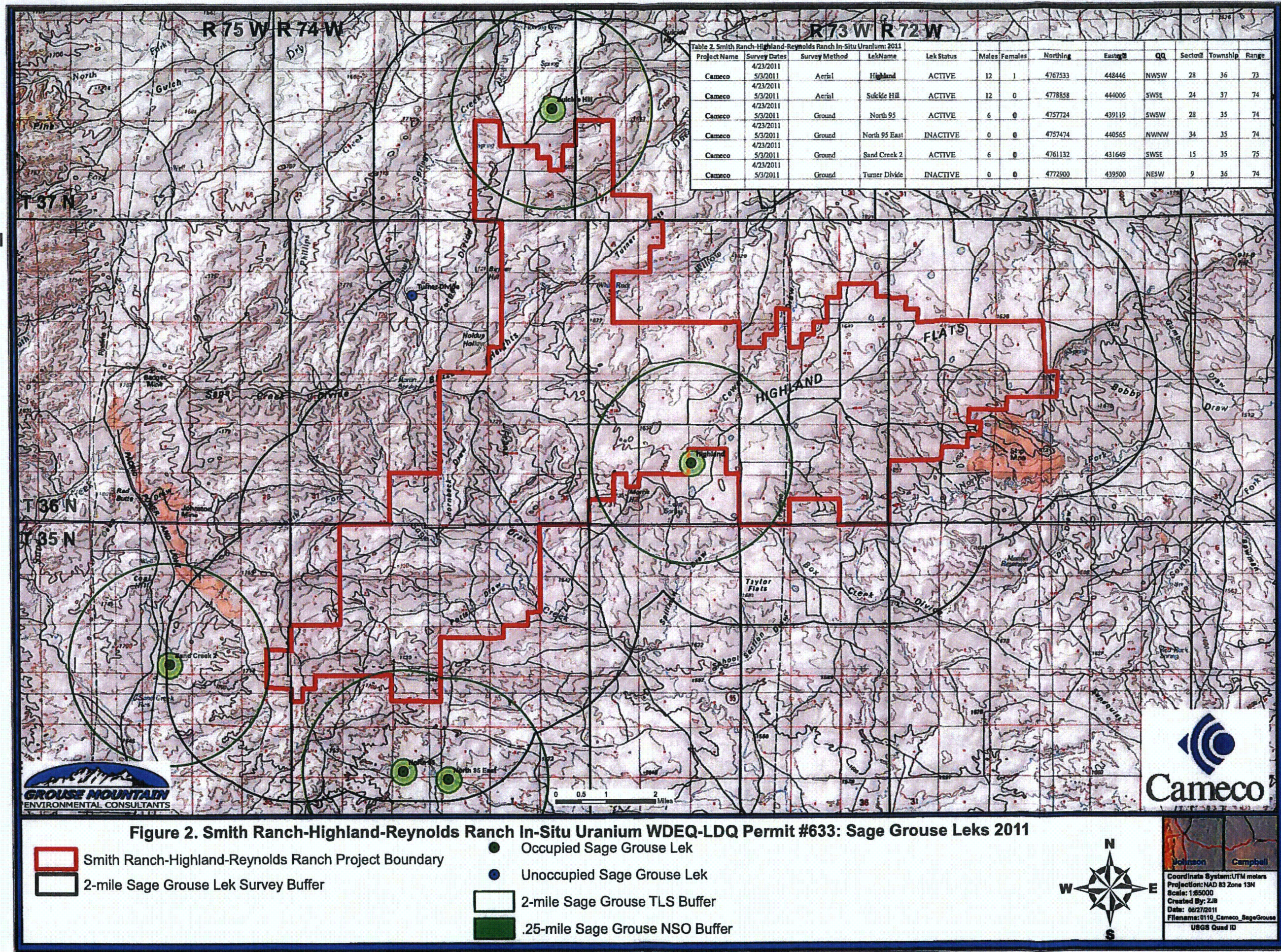
Wetland/Pond Monitoring Site #11

Survey Date	Species Observed
6/27/2011	Red-winged Blackbird, Barn Swallow
7/22/2011	Barn Swallow, Say's Phoebe, Brewer's Blackbird, Horned Lark
8/23/2011	Barn Swallow, Western Meadowlark, Vesper Sparrow
9/21/2011	Western Meadowlark, Horned Lark
10/18/2011	No Observations
11/15/2011	No Observations
12/16/2011	No Observations

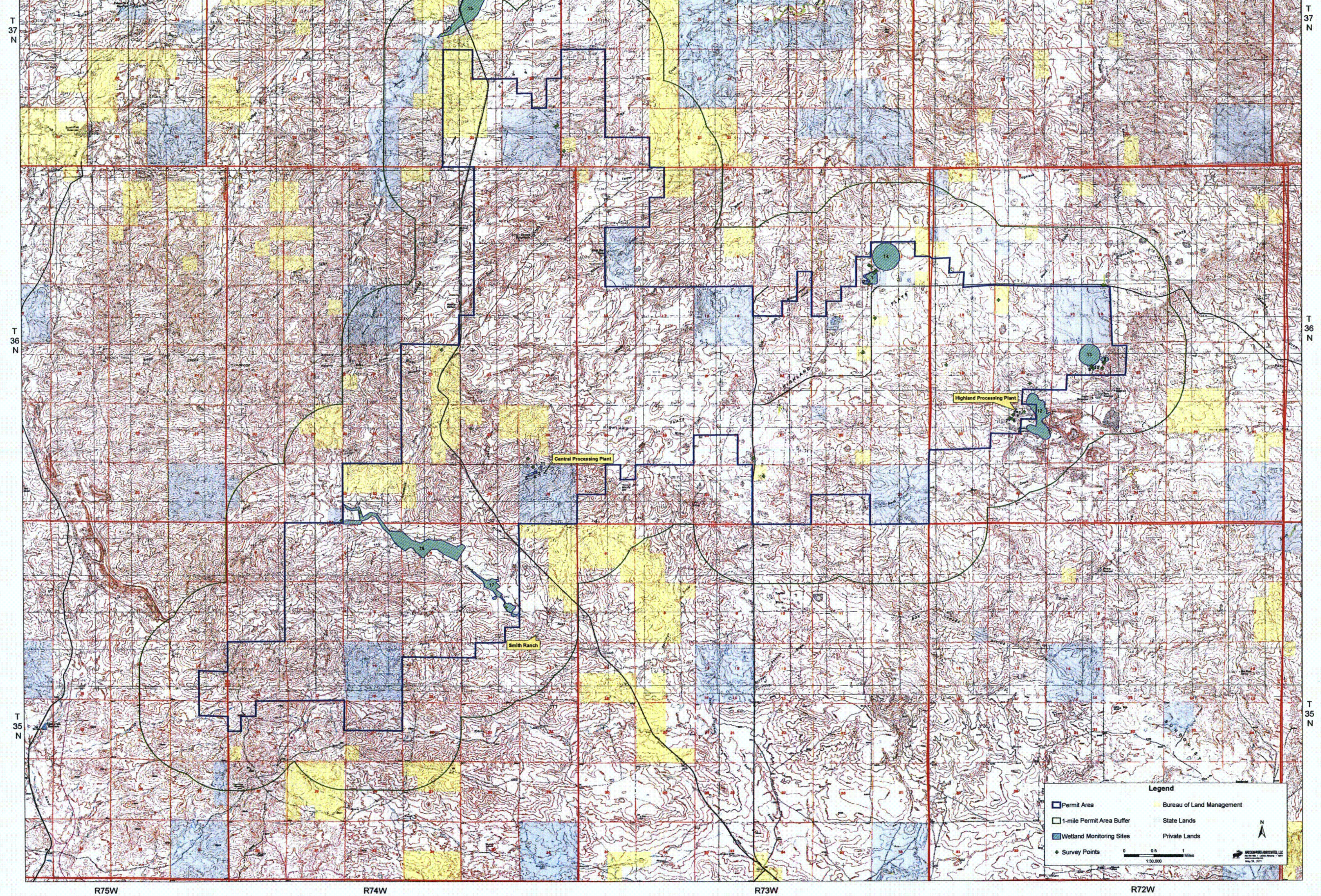
Table 3. Continued.

Wetland/Pond Monitoring Site #14

Survey Date	Species Observed
6/27/2011	Mule Deer (2), Horned Lark, Western Meadowlark, Lark Bunting
7/22/2011	Mule Deer (6), Common Nighthawk, Western Meadowlark, Lark Bunting, Brewer's Blackbird, Vesper Sparrow, Eastern Kingbird
8/23/2011	Lark Bunting, Western Meadowlark, Mule Deer (1), Vesper Sparrow, Barn Swallow
9/21/2011	Northern Harrier
10/18/2011	No Observations
11/15/2011	Mule Deer (2)
12/16/2011	Rough-legged Hawk



Map 1. Wetland Monitoring Sites
and Survey Points within the
Smith Ranch-Highland/
Reynolds Permit Area
during January - March, 2011.



Cameco Reclamation Summary 2011



Cameco

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September 12, 2011

Appendix D9
Supplemental Information Page 1

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Figure 5b. % Total Disturbance Acreage reclaimed: Mixed Grass Prairie/Big Sagebrush

Figure 6. Mixed Grass Prairie/ Big Sagebrush reclaimed Disturbance

Introduction

Power Resources, Incorporated (d.b.a. Cameco Resources (Cameco)) is proposing to continue development of their in-situ uranium extraction operation in Converse County, Wyoming. The Smith Ranch-Highland-Reynolds Ranch In-Situ Recovery Project will consist of combined Wyoming Department of Environmental Quality-Land Quality Division (WDEQ-LQD) permits #603 and #633. In order to monitor and track the effectiveness of their reclamation plan Cameco has contracted Grouse Mountain Environmental Consultants to review and summarize their reclamation efforts as they pertain to wildlife habitats during 2011.

Project Area Description

The 39,870-acre Smith ranch-Highland-Reynolds Ranch Permit Area (Permit Area) of Power Resources, Incorporated (Cameco) is located in the Highland Flats area of the southern Powder River Basin in Converse County, Wyoming. The Permit Area is located approximately 25 miles north-northwest of Douglas and 22 miles northeast of Glenrock, Wyoming (T37N:R74W, Sections 25,26,35,36; T37N:R73W, Sections 30-32; T36N:R74W, Sections 1, 2, 11-14, 22-27, 33-36; T36N:R73W, Sections 5-7, 10-31, 34-36; T36N:R72W, Sections 7, 16-22, 29, 30; T35N:R75W, Sections 13, 24; T35N:R74W, Sections 2-5, 8-11, 14-19, 21). Elevations across the Permit Area ranges from approximately 5,000 to 5,800 feet characterized by gently sloping sagebrush and grassland range with shallow drainages and rolling hills. This area has cold winters and hot summers. Average annual precipitation is about 12 inches per year, with most of the moisture coming in late spring and early summer. The Permit Area is located primarily on private land, but the area is a combination of federal, private, and state lands with federal and state lands occupying a small part of the total Permit Area. This area is a part of the Northwestern Great Plains and is classified as a mixed-grass prairie with a mix of species from both the short and tall grass prairies, additionally influences by the northern desert shrub system. The vegetation types in the Permit Area are mixed-grass prairie/Wyoming Big sagebrush, mixed-grass prairie/riparian dominated grassland, mixed-grass prairie/basin exposed rock and soil, and irrigated croplands. The mixed-grass/Wyoming Big sagebrush is the dominant vegetation type covering 36,106 acres of the permit area.

Disturbance

Disturbance Description

In order to evaluate and monitor mining disturbance within the permit boundary, two parameters were used to describe disturbance. Disturbances within the permit boundary were classified as: short-term and permanent/life of mine. Short-term disturbances will be those disturbances that are reclaimed within the same year which the disturbance occurred and could include well fields and well field construction activities. Permanent/life of mine will be areas such as roads, buildings, and other features that will remain throughout the life of the mine or longer. Long-term disturbances, those reclamation activities that last longer than one year, were not included because the start date of the reclamation activities was unknown. However, activities lasting longer than one year were still evaluated but were included in the short-term classification. Data pertaining to actual disturbed acreage within a mine unit (MU) were not available while evaluating and monitoring the reclamation efforts within the permit area. To accurately calculate, review and document the surface acreage of wildlife habitats disturbed by mining activities it was assumed that the entire area within a MU was disturbed.

Results

Following are a series of graphs used to describe and summarize mining disturbance in wildlife habitats (vegetation types). Each one of the graphs will be explained in detail below the figure.

Figure 1.

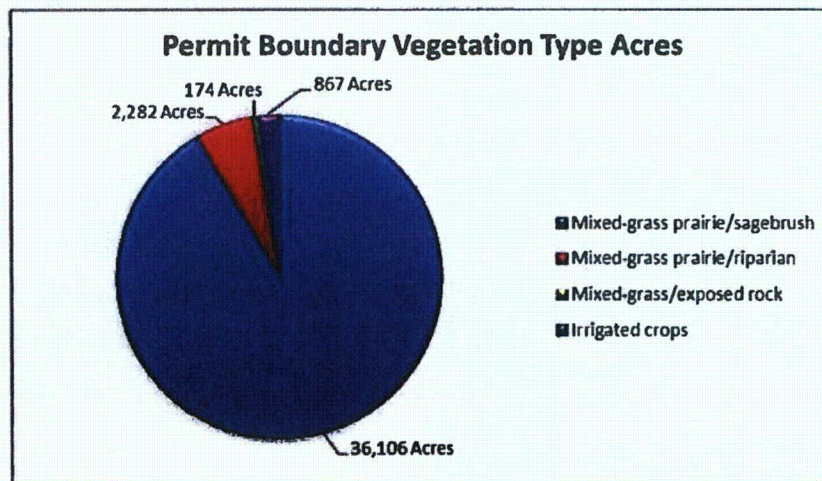


Figure 1 is a general graph summarizing the total acreage of wildlife habitat (vegetation types) types that exist within the boundary of the entire permit area. Approximately 90% of the permit area is comprised the Mixed-grass prairie/Wyoming Big sagebrush habitat type. This habitat type is described as grasses that include bluebunch wheatgrass, rhizomatous wheatgrasses, and blue grama. Grasses of secondary importance include little bluestem, prairie junegrass, and Sandberg bluegrass. Forbs, commonly found in this plant community, include Louisiana sagewort (cudweed), plains wallflower, hairy goldaster, slimflower scurfpea, and scarlet globemallow. Fringed sagewort, Plains pricklypear and winterfat can also occur. The overstory of big sagebrush and understory of grass and forbs provide a diverse plant community that can support domestic livestock and wildlife such as mule deer and antelope. The remaining habitat types are limited throughout the permit area. The mixed-grass prairie/riparian dominated grassland is the other habitat type that has experienced disturbance through mining activities. The mixed grass prairie/riparian dominated grassland habitat type is described as 80% grasses or grass-like plants, 15% forbs and 5% woody plants. The habitat type is dominated by cool season midgrasses. The major grasses include basin wildrye, rhizomatous wheatgrasses, and green needlegrass. Other grasses occurring on the state include Cusick and Sandberg bluegrass, Canada wildrye, needleleaf sedge, blue grama, and prairie junegrass.

Figure 2a.

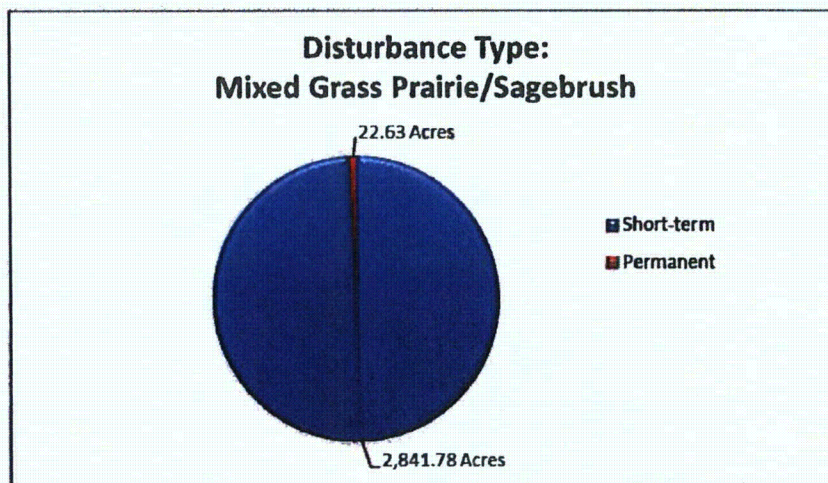


Figure 2b.

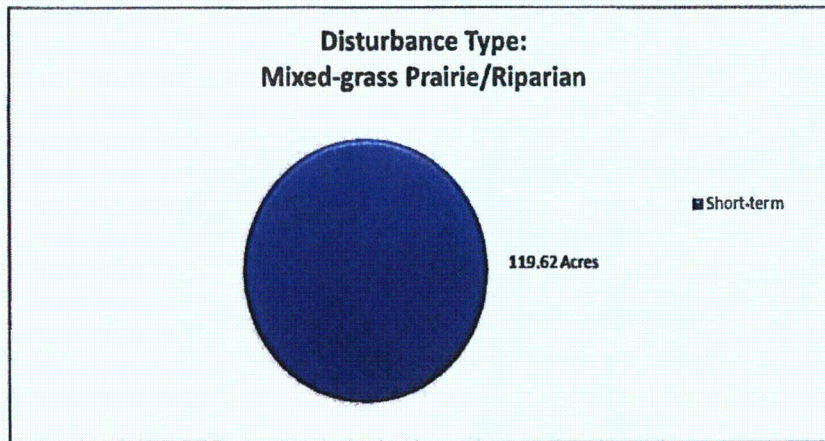


Figure 2a represents the amount of short-term and permanent disturbance within the dominant mixed-grass prairie/sagebrush vegetation type. As mentioned above, when calculating disturbance acres for monitoring mining disturbance and the effectiveness of the reclamation the entire MU was assumed to be disturbed. The assumption allows for accurate monitoring if additional mining/construction activities are conducted within the MU. Figure 2b represents the mixed-grass prairie/riparian grass dominated habitat type. There are currently no permanent disturbances within this habitat type allowing for all disturbance within this habitat type to be reclaimed.

Figure 3a.

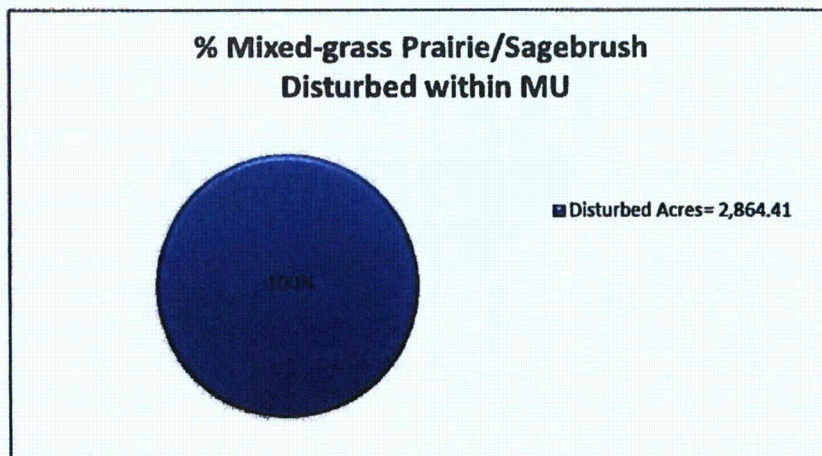
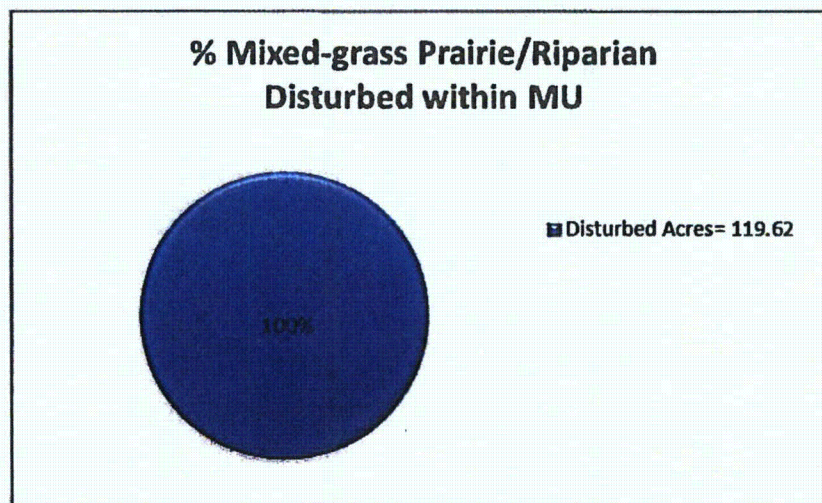


Figure 3b.



Figures 3a and 3b represent the percent of total acreage within each wildlife habitat type that has been disturbed. Again it is important to note that the entire area with a MU was assumed to be disturbed.

Figure 4.

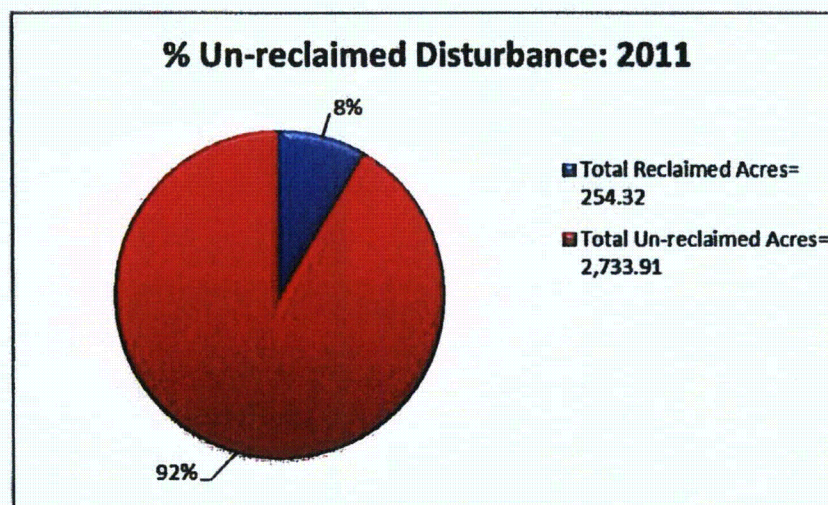


Figure 4 depicts the percentage of un-reclaimed disturbance for 2011.

Reclamation

Proper reclamation, from a wildlife perspective, involves not only stabilizing the soil and establishing ground cover, but fostering productive plant communities with a diversity of species and plant types including: grasses, woody plants, and broadleaf forbs, which will fully serve the nutritional needs of wildlife throughout the year. Successful reclamation facilitates native species to re-establish; allowing a site to regain its original level of productivity. In order to achieve successful reclamation, Cameco utilizes several seed mixes in their overall reclamation plan that have a diversity of both grasses and forbs that are beneficial to wildlife. Successful reclamation, both interim and final, in the permit area is providing better quality habitat including increasing the amount of seasonal forage for large ungulate species including mule deer and pronghorn antelope. In addition to increasing forage quantity and quality for larger animals, smaller wildlife species such as rabbit species, thirteen-lined ground squirrels, golden-mantel ground squirrels, and others can utilize the reclaimed areas not just for foraging but as hiding and escape cover from predators. Several bird species utilize reclaimed areas for both forage and hiding cover. Successful reclamation is beneficial to Greater sage-grouse by providing foraging resources as well as providing habitat for bug species that are utilized heavily by sage-grouse and sage-grouse chicks during the spring. Diverse seed mixes used in Cameco's permit area also provide beneficial hiding cover for sage-grouse chicks that can help to increase overall survival rate. Reclamation is a process and depending on many different variables may take years to reclaim a site to a community that achieves equivalent land capability. Reclaimed areas within the permit area that were seeded in 2010-2011 have yet to reach successful reclamation in terms of equivalent land capability compared to pre-disturbance, however disturbance that has been seeded has been considered as reclaimed for this summary. The following graphs demonstrate the amount of reclamation that has been completed in the two major vegetation types within the permit area during 2011.

Figure 5a.

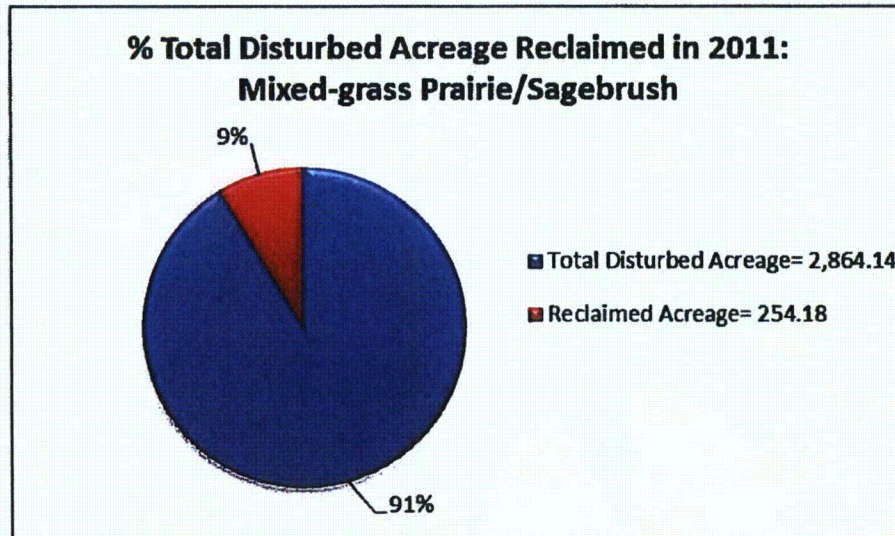


Figure 5b.

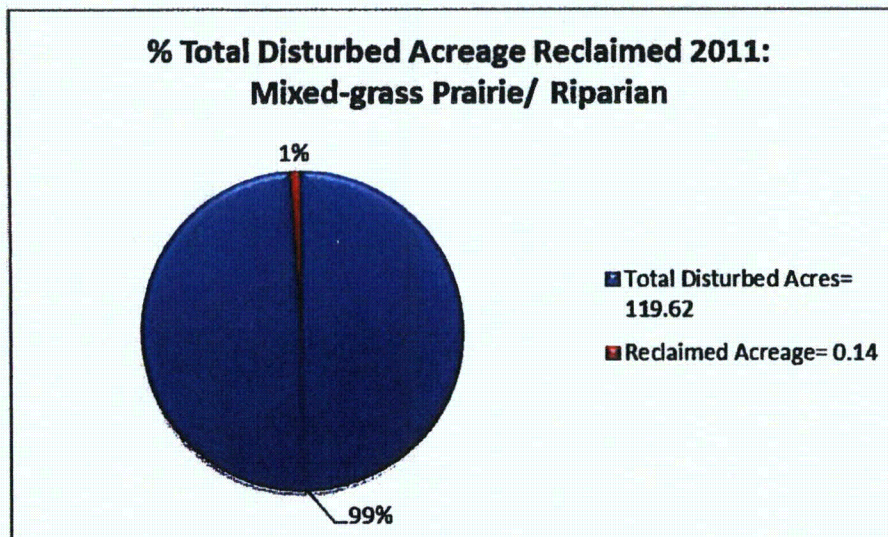
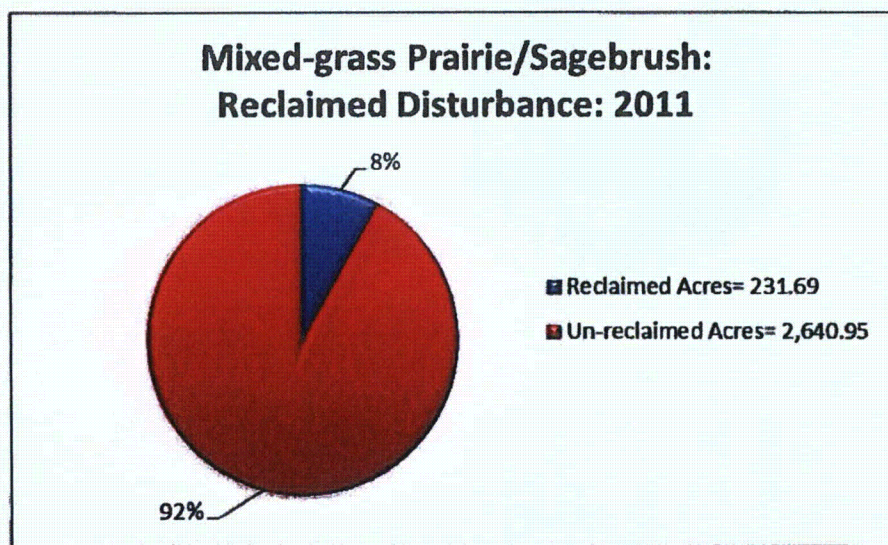


Figure 6.



The Smith Ranch-Highland-Reynolds Ranch In-Situ Recovery Project and associated permit area contain a homogenous landscape dominated by two vegetation types; mixed-grass prairie/Wyoming big sagebrush and mixed-grass prairie/riparian dominated grassland. Although the landscape and vegetation communities are homogenous the permit area contains a diverse wildlife community consisting of large ungulates, small mammals, and a multitude of avian species all of which can benefit from a comprehensive, successful reclamation program. In conjunction with wildlife surveys conducted during the spring and summer of 2011 wildlife use of reclaimed areas was observed and documented. Numerous wildlife species were noted to be utilizing all types of reclaimed areas in different disturbance types (short/long-term and permanent) throughout the entire permit area in all of the MU's. Mule deer and Pronghorn antelope were a conspicuous element of reclaimed areas and particularly in areas where the seeding had been recent presumably foraging on the new, more succulent grasses and forbs. Many avian species were observed using areas with more mature vegetation stands using these

stands for hiding/escape cover. Observations suggest that larger animals are utilizing the reclaimed areas in short/long-term disturbance types where younger, more palatable grass and forb species are available. Conversely, smaller animals such as rabbits and rodents as well as avian species take advantage of the older more mature vegetation communities for security more than for a foraging requirement. The vegetation type and the seed mix used for reclamation did not appear to be a determining factor when wildlife species were choosing where to utilize reclaimed areas however; the wildlife community does appear to use areas of short/long-term disturbances rather than those areas of permanent/life of mine disturbance.

An ocular reclamation assessment was conducted throughout the permit area in conjunction with other wildlife surveys. The species composition and rate of establishment were visually evaluated in the field based on soil structure and type, slope, aspect, erosional considerations, existing vegetative communities, grazing impacts, and site specific mitigation measures that may be needed. Based on the visual evaluation, the rate of establishment was categorized as Good, Fair, or Poor. This categorization was based on the assumption that the rate of establishment progresses at its current rate. Based on these assessments, it was determined that the disturbances within the permit area currently are experiencing a good establishment rate. In order to accurately quantify the rate of establishment and overall success of reclamation within the permit area it is recommended that vegetation transects be established. This approach provides a variety of pertinent information that will allow land managers to make informed reclamation and land use decisions regarding the property being administered.

The composition of vegetation that is becoming established has a diverse mix of grasses but appears to lack a diversified forb and shrub component. The grass species that are becoming established are well suited for the soil type as and the amount of precipitation that is available. The grass species including Canby Bluegrass (*Poa canbi*), Sheeps Fescue (*Festuca ovina*), Side-oats grama (*Bouteloua curtipendula*), Prairie sandreed (*Calamovilfa longifolia*), Blue grama (*Bouteloua gracilis*), and Perennial rye (*Lolium perenne*) are all palatable to both wildlife and livestock at different times of the year and all have sufficient nutritive values for wildlife as well. The only forb species in the seed mixes, Garnder's Saltbush (*Atriplex gardneri*) provides wildlife with highly nutritious forage. Due to its perennial leaves Gardner's saltbush is important winter

forage for wildlife species. It is recommend that additional forb species be included in seed mixes that will be used *for final reclamation*. The addition of forbs can be beneficial to all wildlife species especially in the spring when the forbs first begin to germinate and grow.

Qualifications

Zach Byram, Grouse Mountain Environmental Consultants, conducted field surveys and is the author of this report.

Zach Byram holds a B.S. in Wildlife and Fisheries Biology and Management (2001) from the University of Wyoming. He is currently a Wildlife Biologist with Grouse Mountain Environmental Consultants based in Buffalo, Wyoming. Mr. Byram has 10 years of combined professional experience with federal, state, and research agencies as well as the oil and gas industry. His direct work experience includes applied field work and research with federal and state agencies including the U.S. Forest Service, USDA National Wildlife Research Center, and Montana Fish, Wildlife, and Parks. Mr. Byram has a diverse biological survey background that includes avian, small mammal and fisheries surveys that focused on Peregrine falcon, Pileated Woodpecker, Northern Goshawk, American pine marten, Black-tailed Prairie Dog, and fluvial Arctic grayling. He has also performed vegetation sampling in compliance with state and federal regulations. In addition, his wildlife interests have allowed him to participate in Grey wolf trapping efforts and elk immobilization efforts to assist in the research of Chronic Wasting Disease.

