

Chokecherry and Sierra Madre Wind Energy Project Wildlife Survey Report

Phase I Wind Turbine Development

Prepared for



**555 Seventeenth Street
Suite 2400
Denver, CO 80202**

Prepared by



**295 Interlocken Blvd., Suite 300
Broomfield, CO 80021
(303) 487-1183 / Fax (303) 487-1245
www.swca.com**

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- Attachment A: Phase I Wind Turbine Development Survey Tables and Maps
- Attachment B: Pocket Gopher Occupancy Model

1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the “checkerboard”. The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final Environmental Impact Statement (EIS) concerning the CCSM Project (BLM 2012a) was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre (Figures 1 and 2). The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Included in the ROD is the Wildlife Monitoring and Protection Plan for the CCSM Project that identifies measures to be completed for each site-specific plan of development, including wildlife field reviews (BLM 2012b: Appendix G). Field reviews are intended to reduce impacts by identifying specific locations where impacts might occur and providing opportunities to avoid, minimize, or mitigate impacts. In accordance with the Wildlife Monitoring and Protection Plan, SWCA Environmental Consultants (SWCA) conducted wildlife surveys for the Phase I Wind Turbine Development Site of the CCSM Project in 2013 and 2014. Wildlife surveys focused on the potential occurrence of BLM sensitive species and habitat assessments for species identified in the Wildlife Monitoring and Protection Plan.

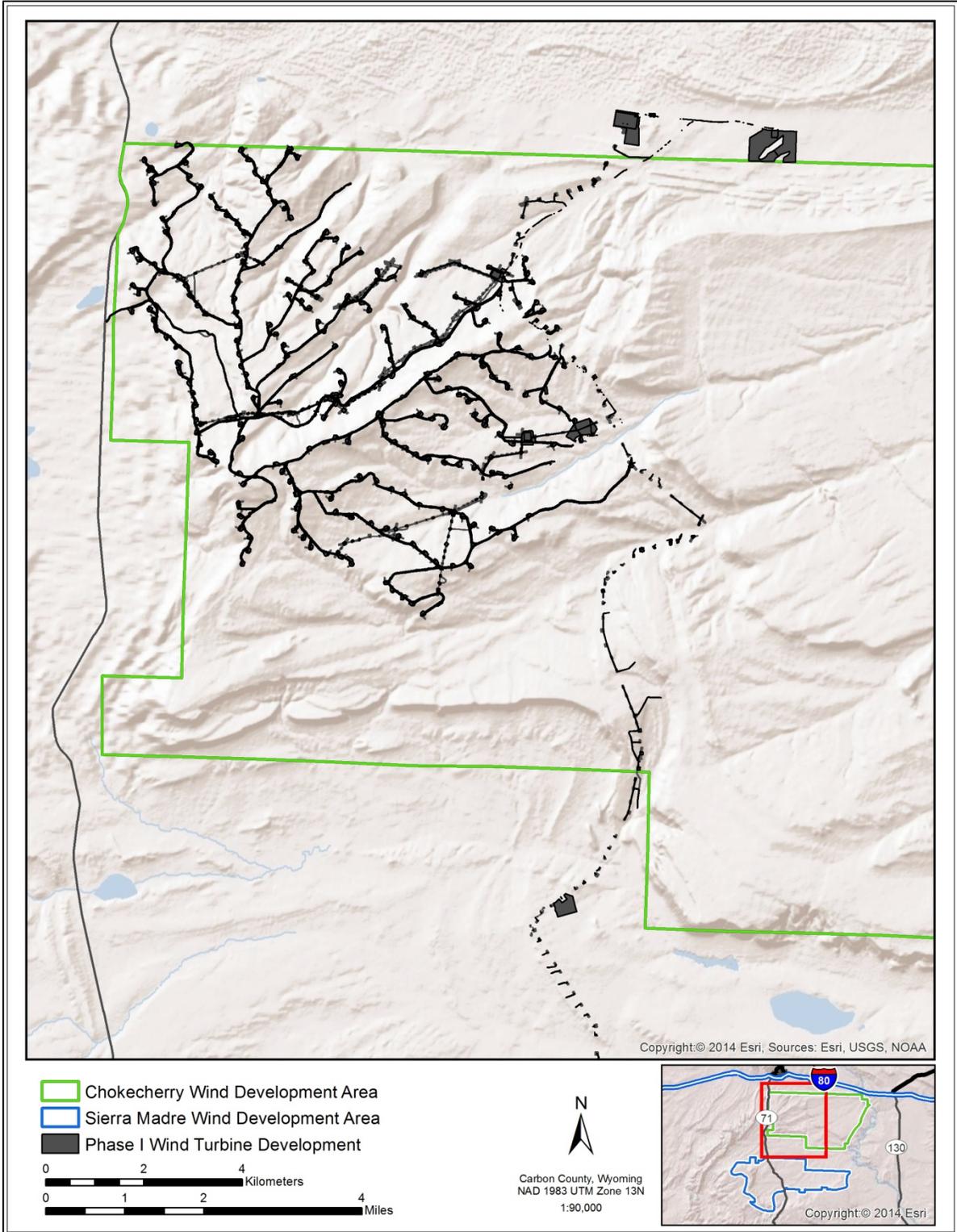


Figure 1. Phase I Wind Turbine Development Survey Area within the Chokecherry Wind Development Area

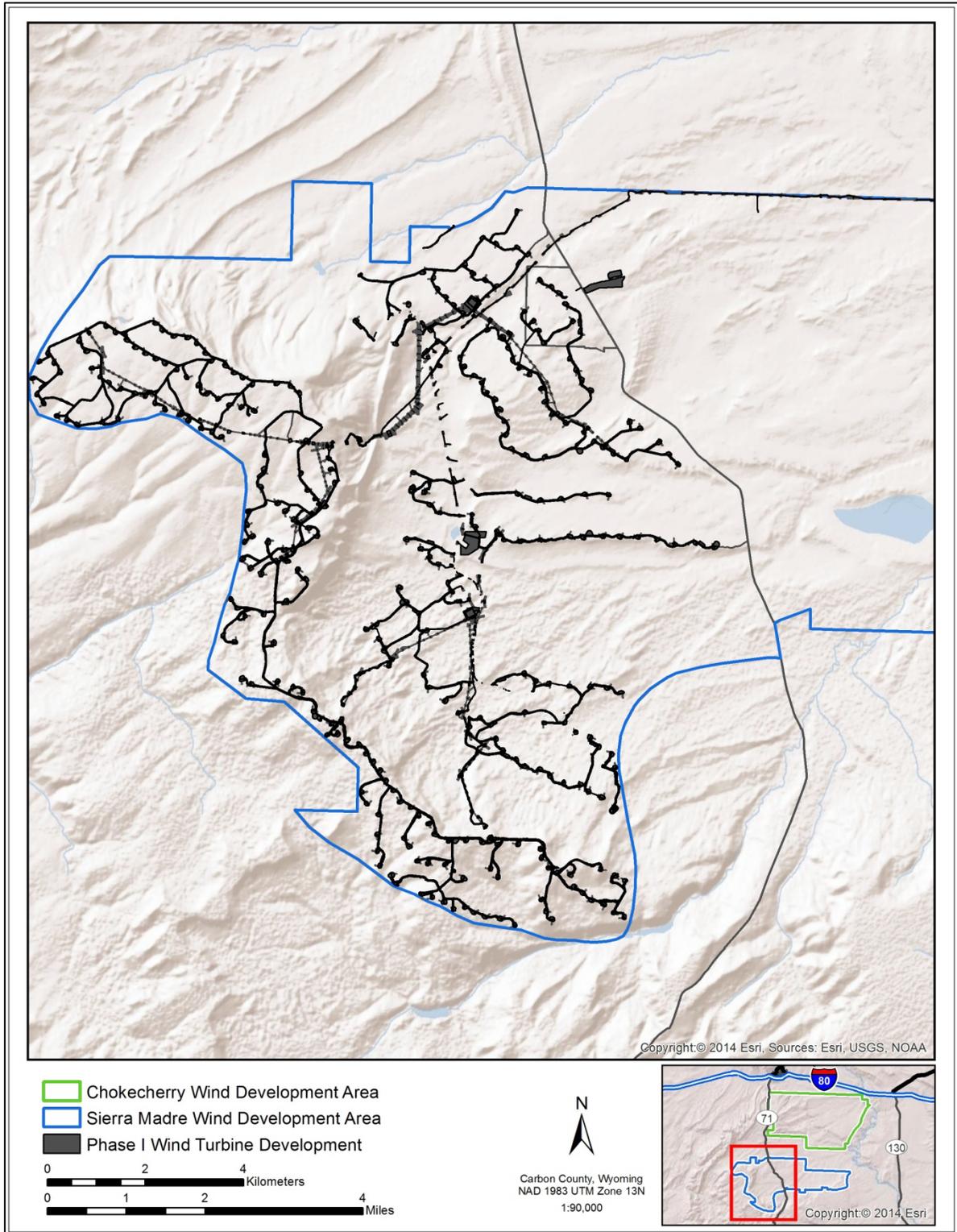


Figure 2. Sierra Madre Wind Development Area of the Phase I Wind Turbine Development Survey Area

2.0 BACKGROUND AND METHODS

Wildlife survey protocols were identified for each wildlife species in the ROD (BLM 2012b). The goal of monitoring efforts is to develop mitigation strategies to avoid and or minimize adverse impacts to wildlife present on the CCSM Project Site. Wildlife field reviews are required for special status species (SSS), including threatened, endangered, candidate, and sensitive species. Surveys for SSS include:

- Raptor, other avian species, and bats
- White-tailed prairie dogs (*Cynomys leucurus*)
- Pygmy rabbit (*Brachylagus idahoensis*)
- Wyoming pocket gopher (*Thomomys clusius*)
- Mountain plover (*Charadrius montanus*)
- Greater sage-grouse (*Centrocercus urophasianus*)
- Western burrowing owl (*Athene cunicularia hypugaea*)
- Amphibians
- Reptiles
- Fish

The list of wildlife species above for which specific field surveys were conducted was developed based on management agency input and public concern identified during the National Environmental Policy Act (NEPA) review process for the CCSM Project (BLM 2012a; 2012b) and the presence of potentially suitable habitat for these species.

SWCA biologists conducted surveys within the Phase I Wind Turbine Development Site, as well as a minimum 100 foot buffer around all limits of disturbance and activity areas. All avian SSS are addressed in the “Avian Resources Report” for the Phase I Wind Turbine Development.

2.1 RAPTORS, OTHER AVIAN SPECIES, AND BATS

PCW has collected detailed data on avian and bat use of the CCSM Project Site through diurnal point count surveys, nesting and breeding bird surveys, raptor long-watch surveys, raptor nest inventories, and other monitoring protocols. Bat data were collected in 2008 and are described in the final environmental impact statement (FEIS) (BLM 2012a). The results of the avian surveys as they relate to Phase I Wind Turbine Development are included in the “Avian Resources Report” for the Phase I Wind Turbine Development.

2.2 WHITE-TAILED PRAIRIE DOG

The state of Wyoming contains approximately 71% of the current national range of white-tailed prairie dog, a fossorial (burrowing) mammal that typically inhabits shrub-steppe and grassland assemblages in cool intermountain basins (Keinath 2004). Prairie dogs are known to provide habitat and forage for many other wildlife species including other BLM sensitive species, such as mountain plover (*Charadrius montanus*), western burrowing owl (*Athene cunicularia hypugaea*), swift fox (*Vulpes velox*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), and black-footed ferret (*Mustela nigripes*). The white-tailed prairie dog is a large ground squirrel (Family *Sciuridae*) that ranges in length between 33-38 centimeters (cm) (13-15 inches [in]) and generally weighs 0.8-1.5 kilograms (kg) (1.8-3.3 pounds [lbs]). Habitat includes mid-elevation (approximately 1,150-3,050 meters above mean sea level) grasslands and shrublands with moderate slope (less than 20%). White-tailed prairie dogs inhabit higher elevation grasslands and shrub-steppe with more abundant shrub cover than its close relative, the black-tailed prairie dog (*C. ludovicianus*) (Campbell and Clark 1981). White-tailed prairie dogs are colonial, forming “towns” averaging 3.2 prairie dogs per hectare (Clark 1973). Unlike black-tailed prairie dogs that form tight colonies with clearly defined boundaries, white-tailed prairie dogs form diffuse colonies of burrows comprised of amorphous fingers and clusters (Seglund et al. 2004).

White-tailed prairie dogs have experienced population declines in recent years and current occupancy estimates are commonly inflated because occupancy is generally based on historic data and pre-plague burrow distributions that are not indicative of current occupation (Keinath 2004, Seglund et al. 2004, Pauli et al. 2006). In 2010, the U.S. Fish and Wildlife Service (USFWS) determined that the white-tailed prairie dog does not warrant protection as a threatened or endangered species under the Endangered Species Act (ESA) of 1973 because its overall distribution has not substantially changed and large acreages of occupied habitat exist across its range, particularly in Wyoming (USFWS 2010). In Wyoming, however, the white-tailed prairie dog remains listed as a BLM sensitive species.

Much of south-central Wyoming contains overlapping populations of several common fossorial mammal species which may potentially create challenges when attempting to delineate white-tailed prairie dog towns. Other burrowing mammals that create burrows similar to white-tailed prairie dogs include Wyoming ground squirrel (*Urocitellus elegans*), American badger (*Taxidea taxus*), and pocket gophers (*Thomomys* spp.).

Numerous mapping and survey efforts for white-tailed prairie dogs have occurred in the vicinity of the CCSM Project Site (Western EcoSystems Technologies, Inc. [WEST] 2008, Smith Environmental and Engineering [SMITH] 2010, SWCA 2012) and white-tailed prairie dog occurrences have been documented (Attachment A – Maps). In 2012 and 2013, SWCA conducted white-tailed prairie dog surveys throughout the CCSM Project site and documented burrow density and activity within colonies. Survey protocols were consistent with McDonald et al. (2011) and Biggins et al. (1993). Survey data from the 2013 white-tailed prairie dog surveys were used to assess white-tailed prairie dog occurrence and activity within Phase I Wind Turbine Development survey area.

2.3 PYGMY RABBIT

The pygmy rabbit is the smallest North American rabbit, with adult weights ranging from 245–544 grams (g) (0.54 to 1.20 lbs) and lengths ranging from 23.1–30.7 cm (9.1 to 12.1 in). The species can be distinguished from other rabbits by its small size, gray color, short rounded ears, small hind legs, and the absence of white on the tail (USFWS 2005). Pygmy rabbits typically occur in areas of tall, dense big sagebrush (*Artemisia* spp.) cover growing on deep, loamy soils. The rabbits are highly dependent on sagebrush to provide both food and shelter throughout the year. The winter diet of pygmy rabbits is comprised of up to 99% sagebrush, which is unique among rabbits.

Pygmy rabbit burrows are typically found in relatively deep, loose soils of wind-borne or water-borne (e.g., alluvial fan) origin. The burrows frequently have multiple entrances, some of which are concealed at the base of larger sagebrush plants. Burrows are relatively simple and shallow, often no more than 6.6 feet (2.0 meters) in length and usually less than 3.3 feet (1.0 meter) deep with no distinct chambers. Burrows are typically dug into gentle slopes or mound/inter-mound areas of more level or dissected topography. In general, the number of active burrows in a colony increases over the summer as the number of juveniles increases. However, the number of active burrows may not be directly related to the number of individuals in a given area because some individual pygmy rabbits appear to maintain multiple burrows, while some individual burrows are used by multiple individuals (USFWS 2005).

Pygmy rabbits occasionally make use of burrows abandoned by other species, such as the badger (*Taxida taxus*). As a result, they may occur in areas of shallower or more compact soils that support sufficient shrub cover. Natural cavities (such as holes in volcanic rock), rock piles, stone walls, and areas around abandoned buildings may also be used. During winter months, pygmy rabbits make extensive use of snow burrows as travel corridors among their underground burrows, for protection from predators, use as thermal cover, and/or access to sagebrush forage (USFWS 2005).

The pygmy rabbit's current geographic range, excluding the Columbia Basin Distinct Population Segment, includes most of the Great Basin and some of the adjacent intermountain areas of the western United States, including southwestern Wyoming. The pygmy rabbit is thought to have a patchy distribution across its range associated with tall, dense stands of big sagebrush where soils are sufficiently deep and loose to allow burrowing (Keinath and McGee 2004). However, pygmy rabbit use has been recorded in low sagebrush habitats as well (BLM 2012a).

A predictive model prepared by the Wyoming Natural Diversity Database (WYNDD) indicates possible occurrence of potential habitat throughout the CCSM Project Site (BLM 2012a). Potential impacts to pygmy rabbits from the CCSM Project include 1) direct loss of habitat; 2) indirect loss of habitat, including displacement due to increased traffic on roads and human activity; and 3) inadvertent mortalities due to increased traffic on roads and human activity (BLM 2012a).

Pygmy rabbit surveys were completed between September and November 2012 and between May and October 2013. As required by mitigation measure SSS-1 in the CCSM Project ROD (BLM 2012b), pygmy rabbit surveys were conducted in areas within 0.25- mile of the Phase I Wind Turbine Development Site that showed characteristics of pygmy rabbit habitat. Survey protocols were consistent with Ulmschneider (2004). Survey routes were adjusted to investigate areas that appeared to provide potential pygmy rabbit habitat. Protocols required that each identified pygmy rabbit burrow system (not individual openings), pygmy rabbit sighting, or pygmy rabbit pellet pile be recorded as a point feature with a global positioning system (GPS) and that photographs be taken of the diagnostic evidence used to identify pygmy rabbit use.

2.4 WYOMING POCKET GOPHER

Pocket gophers are small, vole-like mammals that are adapted to fossorial living (i.e., subterranean), with small ears, small eyes, fur-lined cheek pouches used to carry food, and very strong front limbs with long nails used for digging. There are several species of pocket gophers in the western United States that look very similar, making it difficult to identify species. The Wyoming pocket gopher is smaller and paler than other pocket gophers, with a distinctive yellow cast to its fur (Beauvais and Dark-Smiley 2005). The known range of Wyoming pocket gopher is south-central Wyoming, almost entirely south of Interstate 80 in Carbon and Sweetwater Counties; however, it is possible populations may extend into northern Colorado (Beauvais and Dark-Smiley 2005).

Characterization of habitat components for Wyoming pocket gopher continues to be refined. In the past, Wyoming pocket gopher habitat has been described as well-drained, gravelly soiled ridge tops and edges of deeply eroded washes, as well as a stronger association with greasewood (*Sarcobatus vermiculatus*) than sagebrush habitats (Clark and Stromberg 1987; Beauvais and Dark-Smiley 2005). Trapping efforts in 2008 found the presence of Wyoming pocket gophers away from ridge tops, although all sites appear to be at least moderately sloped (Keinath and Griscom 2008, 2009). The 2008 capture site data further suggest that soil type may be of limited importance, except that the species is rarely found in soils that are greater than 60% clay (Keinath and Griscom 2009). Low-statured shrubs and forbs dominate the vegetative component of known Wyoming pocket gopher sites, while sagebrush abundance is often limited. The 2008 trapping efforts did not find Wyoming pocket gophers in areas of moderate to high dominance of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), sand dunes, or in such low-lying areas as valley bottoms and flats dominated by greasewood. Additional trapping in 2009 found that the Wyoming pocket gopher occurs on sites with 50% to 80% bare ground, little to no grass or littercover, where Gardner's saltbush and winterfat (*Krascheninnikovia lanata*) are present and big sagebrush is absent or subdominant (Griscom et al. 2010). Significant habitat differences exist between unoccupied habitat, Wyoming pocket gopher habitat, and northern pocket gopher habitat (*Thomomys talpoides*) (Table 1).

Table 1. Habitat preferences of northern pocket gopher, Wyoming pocket gopher, and unoccupied habitat

Habitat Component	Habitat Characteristics		
	Unoccupied	Northern Pocket Gopher	Wyoming Pocket Gopher
Dominant Shrub Cover (%)			
Gardner's saltbush	4	5	62
Big sagebrush	60	76	10
Winterfat	0	0	14
Slope	NS	Steeper slopes	Flatter slopes
Tunnel width	NS	Wider tunnels	Narrower tunnels
Litter cover class	More litter cover	More litter cover	Less litter cover
Rock cover class	More rock cover	More rock cover	Less rock cover
Bare soil cover class	Less bare soil	Less bare soil	More bare soil
Perennial grass cover class	NS	More grass cover	Less grass cover

Modified from Griscom et al. 2010.

NS = not significantly different from Wyoming pocket gopher

Burrow systems associated with Wyoming pocket gophers range from approximately 6 to 12 inches (15 to 30 cm) below the surface, typically consisting of a network of feeding tunnels connected to a smaller and deeper system of chambers that are used for nesting and food storage (Beauvais and Dark-Smiley 2005). Although pocket gopher activity is easy to identify in the field by locating mounds, it is difficult to know which species occupies a particular site; however, tunnel diameter has been used as an indicator to distinguish Wyoming pocket gopher from other species (Griscom and Keinath 2010). Tunnel diameter in combination with percent bare ground and Gardner's saltbush (*Atriplex gardneri*) cover has higher predictive capability (Griscom and Keinath 2010).

Potential habitat for Wyoming pocket gophers has been modeled within the CCSM Project site (Keinath and Griscom 2008; WYNDD 2010a). The potential impacts to Wyoming pocket gopher from the CCSM Project include 1) direct loss of habitat; 2) indirect loss of habitat; and 3) increased traffic on roads and human activity resulting in Wyoming pocket gopher fatalities (BLM 2012a).

Pocket gopher mound surveys were completed between May and November 2013 and followed WYNDD protocols (WYNDD 2010b). As stipulated by the CCSM Project ROD (BLM 2012b), analysis for pocket gopher habitat included a 75-meter buffer around Phase I Wind Turbine Development Site. Pocket gopher mounds and/or complexes were recorded when fresh mounds were located. Pocket gophers create mounds by pushing soil out from

their tunnel systems. These mounds are round and approximately 8 to 18 inches (20 to 45 cm) in diameter, and often do not have external holes. Fresh mounds look moist and fluffy and are relatively untouched by wind and rain. If less than five fresh mounds were found, the location was recorded as a point feature with the GPS unit. When a complex contained more than five fresh mounds, the entire complex (fresh and old mounds) was recorded with the GPS unit as a polygon feature. In general, a “complex” was defined as mounds occurring within approximately 20 meters of adjacent mounds.

Griscom and Keinath (2010) developed a diagnostic tool to determine pocket gopher species occupancy using easily measurable field variables. This model predicts if mounds are more likely occupied by Wyoming pocket gopher or the more common northern pocket gopher. Input variables for the model were based on a number of significant differences between mound characteristics and cover variables (e.g., burrow diameter, percent bare ground, percent sagebrush cover, etc.) recorded at Wyoming pocket gopher trapping locations, northern pocket gopher trapping locations, and unoccupied control sites (Table 1).

Data recorded at each pocket gopher site during 2013 surveys included the number of fresh mounds, number of old mounds, vegetation type, percent bare ground, percent litter, and burrow diameter. Burrow diameter, in combination with percent bare ground and percent sagebrush cover, is used to determine the probability that the occurrence was likely Wyoming pocket gopher as opposed to northern pocket gopher.

2.5 MOUNTAIN PLOVER

Mountain plover are discussed in the “Avian Resources Report” for the Phase I Wind Turbine Development.

2.6 GREATER SAGE-GROUSE

Greater sage-grouse are discussed in the “Avian Resources Report” for the Phase I Wind Turbine Development.

2.7 WESTERN BURROWING OWL

Western burrowing owls are discussed in the “Avian Resources Report” for the Phase I Wind Turbine Development.

2.8 AMPHIBIANS AND REPTILES

Two BLM sensitive amphibian species potentially occur in CCSM Project site: northern leopard frog (*Rana [Lithobates] pipiens*) and Great Basin spadefoot toad (*Spea intermontana*). A review of WYNDD occurrence records concluded that the northern leopard frog has been located within the CCSM Project Site; however, the most current record was 1995. A review of WYNDD occurrence records did not indicate an account of Great Basin spadefoot toad in the CCSM Project Site. Per the Wildlife Monitoring and Protection Plan (Appendix G of the CCSM Project ROD (BLM 2012b)), amphibian and reptile monitoring was accomplished through opportunistic observations while performing other wildlife surveys.

2.9 FISH

The Phase I Wind Turbine Development Site is located within the North Platte River and Yampa-White River basins and does not contain habitat for any special status fish species. A watershed monitoring plan was prepared to avoid and or minimize adverse impacts to watershed resources present on the CCSM Project Site. The monitoring and mitigation measures presented in the watershed monitoring plan will benefit fisheries. Fish population monitoring within the CCSM Project Site will be conducted by the WGFD in coordination with the BLM.

3.0 RESULTS AND DISCUSSION

3.1 EXPLANATION OF RESULTS

Results are reported below as broken out by the different types of disturbance within the Phase I Wind Turbine Development Site. The disturbance types are: Activity, Initial, and Long-term.

- Activity areas are defined by locations of casual use, i.e. no ground clearing activities.
- Initial disturbance is defined as the total area that will be disturbed during construction.
- Long term disturbance is the area that will remain disturbed during CCSM Project operations.

3.2 WHITE-TAILED PRAIRIE DOGS

White-tailed prairie dog activity was identified at 62 colonies (44 active, 18 inactive) in the Phase I Wind Turbine Development survey area (Attachment A- Maps A.1-A.22).

Chokecherry WDA

In the Chokecherry WDA portion of the survey area, 4 colonies (3 active, 1 historic) were identified. All colonies were located north of the Chokecherry WDA near the interconnect substation and a construction laydown yard (Attachment A-Maps A.1-A.22). Sites in the Chokecherry WDA ranged from 0.04 to 28.9 acres, totaling 46.2 acres with 64.4% of those acres occurring within the initial disturbances associated with the Phase I Wind Turbine Development.

Area between the WDAs

Three active colonies were identified in the corridor between the two WDAs (Attachment A-Maps A1-A.22). Colonies ranged in size from 1.42 to 203.3 acres and totaled 226.8 acres of which 0.4% occurs within the initial disturbance area associated with the Phase I Wind Turbine Development. One additional colony slightly overlaps the activity areas associated with the Phase I Wind Turbine Development.

Sierra Madre WDA

Within the Sierra Madre WDA portion of the survey area, 55 colonies (38 active, 17 inactive) were identified (Attachment A – Maps A.1-A.22). Colonies ranged from 0.002 to 346 acres, totaling 1,373 acres of which 7.9% occurs within the initial disturbances associated with the Phase I Wind Turbine Development. Two additional colonies totaling less than 1 acre overlap with the activity areas associated with the Phase I Wind Turbine Development.

3.3 PYGMY RABBIT

Pygmy rabbit locations within the Phase I Wind Turbine Development Site occurred in dense, tall patches of big sagebrush (*Artemisia tridentata* sp.) or black sagebrush (*Artemisia nova*) and big sagebrush (Figures 3-5). Thirty-five pygmy rabbit locations were identified during survey efforts, 21 active and 14 inactive (Attachment A-Maps A.1-A.22). No locations occur within the long-term disturbance area. Four locations (2 active, 2 inactive) occur within the initial disturbance area. The remaining 31 locations occur outside the initial and long-term limits of disturbance.

Chokecherry WDA

The survey area in the Chokecherry WDA contained 16 sites (8 active, 8 inactive) (Attachment A- Maps A.1-A.12). All of the sites were located outside of the long-term limits of disturbance although two inactive locations were located within the initial disturbance area. One active location was located within the activity areas associated with the Phase I Wind Turbine Development.

Area between the WDAs

The area between the WDAs contained no pygmy rabbit sites (Attachment A-Maps A.11-A.13).

Sierra Madre WDA

In the Sierra Madre WDA, 19 pygmy rabbit sites (13 active and 6 inactive) were identified in Lower Miller Hill and no sites were identified in Upper Miller Hill (Attachment A- Maps A.14-A.22). All of the sites are located outside of the Phase I Wind Turbine Development Site. Two active sites were located within the initial disturbance area.



Figure 3. Habitat in which pygmy rabbit activity was observed



Figure 4. Observed pygmy rabbit burrow opening



Figure 5. Observed pygmy rabbit pellets

3.4 WYOMING POCKET GOPHER

During the Phase I Wind Turbine Development survey, 273 active pocket gopher mounds and mound complexes were located within 75 meters of the limits of disturbance (Attachment A – Table A.1, Maps A.1-A.22). An additional 17 locations were located within 75 meters of activity areas associated with the Phase I Wind Turbine Development. Burrow diameters, percent litter cover, percent sagebrush cover, and percent bare ground were recorded at each location.

Following the Griscom and Keinath (2010) model (Attachment B), 24 mound/mound complexes (approximately 8% of all pocket gopher activity) were predicted as Wyoming pocket gopher (*probability (P)* greater than 0.8), 188 mound/mound complexes (approximately 65% of all pocket gopher activity) were predicted as northern pocket gopher (*P* less than 0.2). The remaining 78 mound/mound complexes (approximately 27% of all pocket gopher activity) were characterized as unknown pocket gopher (*probability (P)* greater than 0.2 and less than 0.8). Overall, predicted Wyoming pocket gopher mounds occurred in relatively flat areas with dominant Gardner’s saltbush cover, bare soil, and very little sagebrush cover (Figure 6). Predicted northern pocket gopher activity occurred in rolling terrain with dominant big sagebrush cover, increased perennial cover, and less saltbush (Figure 7). Four of the 24 mounds predicted to be Wyoming pocket gopher were located within the Phase I Wind Turbine Development Site. The remaining 20 mounds were outside of the limits of disturbance.



Figure 6. Predicted Wyoming pocket gopher habitat



Figure 7. Predicted northern pocket gopher habitat

Chokecherry WDA

The survey area in the Chokecherry WDA contained 180 pocket gopher mounds/complexes within 75 meters of the limits of disturbance. Following the Griscom and Keinath (2010) model (Attachment B), 9 mound/mound complexes (approximately 5% of all pocket gopher activity) were predicted as Wyoming pocket gopher (*probability (P)* greater than 0.8), 128 mound/mound complexes (approximately 71% of all pocket gopher activity) were predicted as northern pocket gopher (*P* less than 0.2). The remaining 43 mound/mound complexes (approximately 24% of all pocket gopher activity) were characterized as unknown pocket gopher (*probability (P)* greater than 0.2 and less than 0.8). Eleven additional pocket gopher locations (all predicted northern pocket gopher) were identified within 75 meters of activity areas associated with the Phase I Wind Turbine Development. One of the 9 predicted Wyoming pocket gopher locations in the Chokecherry WDA was located within the limits of disturbance. The remaining 8 locations were outside of the limits of disturbance.

Area between the WDAs

The 75 meter buffer surrounding the corridor between the WDAs contained five pocket gopher mounds/complexes, none of which occur within the limits of disturbance. Three of the locations were identified as Wyoming pocket gopher and two were identified as unknown pocket gopher.

Sierra Madre WDA

In the Sierra Madre WDA, 88 pocket gopher mounds were located within the 75m buffer surrounding the limits of disturbance. Following the Griscom and Keinath (2010) model (Attachment B), 12 mound/mound complexes (approximately 13% of all pocket gopher activity) were predicted as Wyoming pocket gopher (*probability (P)* greater than 0.8), 43 mound/mound complexes (approximately 49% of all pocket gopher activity) were predicted as northern pocket gopher (*P* less than 0.2). The remaining 33 mound/mound complexes (approximately 38% of all pocket gopher activity) were characterized as unknown pocket gopher (*probability (P)* greater than 0.2 and less than 0.8). Six additional pocket gopher locations (all predicted northern pocket gopher) were identified within 75 meters of activity areas associated with the Phase I Wind Turbine Development. Three of the 12 predicted Wyoming pocket gopher locations in the Sierra Madre WDA were located within the limits of disturbance. The remaining 9 locations were outside of the limits of disturbance.

3.5 AMPHIBIANS AND REPTILES

No observations of amphibians or reptiles were recorded during wildlife surveys of the Phase I Wind Turbine Development. Phase I Wind Turbine Development survey area contains limited habitat for amphibian species at crossings of perennial or intermittent stream channels. Several small ponds and ephemeral pools in the Sierra Madre WDA of the Phase I Wind Turbine Development survey area likely provide suitable habitat for amphibian species including boreal chorus frogs (*Pseudacris maculata*). Ephemeral pools suitable for use by

spadefoot toads could be present in the Phase I Wind Turbine Development survey area although no evidence of suitable habitat was found during surveys. It is likely that some reptile activity occurs throughout the Phase I Wind Turbine Development survey area.

3.6 FISH

Most of the Phase I Wind Turbine Development Site is located within the Sage Creek basin (North Platte River Basin), and contains no special status fish species. The western portion of the Phase I Wind Turbine Development Site on Upper Miller Hill lies in the extreme upper headwaters (Grove and McKinney Creeks) of the Muddy Creek sub-basin and does not contain special status fish species (WGFD 2008). The Watershed Monitoring Program (Appendix F, POD) is designed to monitor any impacts to the watershed caused by construction and operation of the CCSM Project.

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APPENDIX A
Phase I Wind Turbine Development Survey Tables and Maps

Table A.1. Pocket Gopher Mound Occurrences

ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
10717	-107.137	41.748	11	15	46	58	56	53	Sagebrush	17.1	62.5	NOPG	0.0886
10718	-107.164	41.710	7	15	53	51	58	54	Sagebrush	87.4	37.5	NOPG	<0.001
10720	-107.255	41.462	9	15	0	0	0	0	mountain shrub	3.5	2.5	UNKN	ND
10722	-107.129	41.748	6	20	48	56	61	55	Sagebrush	69	3.1	NOPG	<0.001
10723	-107.167	41.725	37	12	48	56	58	54	Sagebrush	60.5	37.5	NOPG	<0.001
10726	-107.165	41.710	14	30	0	0	0	0	Sagebrush	63.7	20	UNKN	ND
10733	-107.136	41.648	14	10	46	51	58	52	Grasses	2.3	2.5	NOPG	0.0393
10734	-107.282	41.500	13	40	0	0	0	0	Saltbush	ND	ND	UNKN	ND
10740	-107.259	41.449	30	50	53	58	56	56	Sagebrush	3.3	37.5	NOPG	0.2612
10753	-107.165	41.711	21	5	56	53	0	36	Sagebrush	79.1	20	NOPG	<0.001
10754	-107.153	41.604	20	5	56	46	56	53	Saltbush	0.4	79.5	WYPG	0.9858
10755	-107.160	41.598	25	0	0	0	0	0	Saltbush	3.9	87.5	UNKN	ND
10756	-107.151	41.586	14	4	51	61	61	58	Saltbush	5.8	87.5	WYPG	0.9043
10765	-107.171	41.715	4	4	0	0	0	0	Sagebrush	56.6	37.5	UNKN	ND
10773	-107.275	41.496	2	18	0	0	0	0	Saltbush	1.3	87.5	UNKN	ND
10774	-107.275	41.493	3	5	0	0	0	0	Saltbush	12	62.5	UNKN	ND
10775	-107.275	41.493	4	2	0	0	0	0	Saltbush	9.9	62.5	UNKN	ND
10776	-107.272	41.466	1	4	0	0	0	0	mountain shrub	7.5	10	UNKN	ND
10777	-107.273	41.466	2	5	0	0	0	0	Sagebrush	3.2	20	UNKN	ND
10779	-107.261	41.463	2	0	0	0	0	0	mountain shrub	0.7	2.5	UNKN	ND
10794	-107.250	41.552	2	0	48	0	0	16	Sagebrush	12.6	87.5	WYPG	0.8555
10795	-107.151	41.585	4	1	51	0	0	17	Saltbush	3	87.5	WYPG	0.9769
10808	-107.105	41.741	0	0	41	58	48	49	Saltbush	8.1	87.5	WYPG	0.93
10809	-107.109	41.741	0	0	43	58	0	34	Sagebrush	43.2	37.5	NOPG	<0.001
1	-107.274	41.468	8	6	52	62	55	56	None (woodland/grass/forb)	0	2	NOPG	0.04089733

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ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
2	-107.263	41.465	3	10	62	58	61	60	Wild Rose (ROWO)	0	2	NOPG	0.02652116
3	-107.247	41.459	10	100	61	64	74	66	Snowberry (SYAL)	0	6	NOPG	0.019
8	-107.307	41.553	2	12	51	62	54	56	Big sagebrush (ARTR2)	7	10	NOPG	0.01383439
15	-107.172	41.681	6	25	39	40	37	39	Big sagebrush (ARTR2)	16	51	UNKN	0.206203
31	-107.248	41.470	15	20	64	58	59	60	Snowberry (SYAL)	8	6	NOPG	0.00456785
33	-107.250	41.476	15	20	38	49	34	40	Snakeweed (GUTIE)	2	45	WYPG	0.84093035
35	-107.275	41.492	2	7	55	51	53	53	Big sagebrush (ARTR2)	16	29	NOPG	0.00838658
36	-107.248	41.479	8	15	43	44	46	44	Big sagebrush (ARTR2)	10	40	UNKN	0.21276587
37	-107.239	41.478	5	6	46	44	44	45	Saltush (ATRIP)	8	56	UNKN	0.6237588
38	-107.242	41.478	4	0	44	46	47	46	Horsebrush (TETRA3)	8	66	UNKN	0.77215739
39	-107.251	41.475	4	20	48	46	46	47	Big sagebrush (ARTR2)	5	43	UNKN	0.49960833
434	-107.289	41.493	4	0	48	53	46	49	Big sagebrush (ARTR2)	30	10	NOPG	6.8268E-05
435	-107.294	41.495	8	15	36	46	48	43	Big sagebrush (ARTR2)	5	73	WYPG	0.94546152
436	-107.286	41.504	5	40	47	44	52	48	Rabbitbrush (CHRYS9)	8	44	UNKN	0.30515549
439	-107.294	41.506	8	30	45	43	49	46	Saltbush (ATRIP))	0	82	WYPG	0.99058259
1247	-107.362	41.540	3	5	32	42	44	39	Big sagebrush (ARTR2)	20	46	NOPG	0.05254381
1248	-107.362	41.540	8	12	56	41	42	46	Big sagebrush (ARTR2)	15	50	NOPG	0.11656864
1249	-107.340	41.526	20	40	48	46	49	48	Big sagebrush (ARTR2)	15	47	NOPG	0.08145302
1250	-107.339	41.528	40	75	51	51	38	47	Big sagebrush	15	39	NOPG	0.04868998

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ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
									(ARTR2)				
1251	-107.374	41.526	5	2	32	54	52	46	Big sagebrush (ARTR2)	25	37	NOPG	0.00332452
1252	-107.366	41.526	2	20	48	43	52	48	Big sagebrush (ARTR2)	20	0	NOPG	0.00048559
1253	-107.365	41.528	6	15	42	48	50	47	Big sagebrush (ARTR2)	10	0	NOPG	0.00755721
2053	-107.328	41.477	6	2	38	42	42	41	Big sagebrush (ARTR2)	6	38	UNKN	0.49823334
2057	-107.324	41.485	3	0	46	0	0	15	None (woodland/grass/forb)	0	10	UNKN	
2065	-107.270	41.451	5	10	28	26	31	28	Big sagebrush (ARTR2)	20	53	UNKN	0.25327269
2067	-107.265	41.435	8	30	0	0	0	0	Big sagebrush (ARTR2)	50	14	UNKN	
2068	-107.265	41.437	10	16	44	47	43	45	Big sagebrush (ARTR2)	30	28	NOPG	0.00049125
2070	-107.236	41.682	1	0	34	41	31	35	Big sagebrush (ARTR2)	12	68	WYPG	0.81566766
2071	-107.237	41.682	2	25	32	45	37	38	Big sagebrush (ARTR2)	12	68	UNKN	0.76649058
2072	-107.217	41.685	4	5	48	48	38	45	Big sagebrush (ARTR2)	8	75	WYPG	0.88863103
2073	-107.332	41.479	20	30	39	44	41	41	Big sagebrush (ARTR2)	18	54	NOPG	0.12713478
2074	-107.338	41.487	15	20	32	45	48	42	Big sagebrush (ARTR2)	25	50	NOPG	0.0156322
2473	-107.221	41.679	2	10	49	83	65	66	Big sagebrush (ARTR2)	26	56	NOPG	0.0013606
2474	-107.219	41.676	4	4	45	42	41	43	Big sagebrush (ARTR2)	30	40	NOPG	0.00165604
2475	-107.220	41.672	5	18	57	53	59	56	Big sagebrush	20	46	NOPG	0.00819394

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ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
									(ARTR2)				
2476	-107.220	41.670	6	14	53	58	61	57	Big sagebrush (ARTR2)	20	46	NOPG	0.00733211
2477	-107.217	41.669	6	20	56	54	60	57	Big sagebrush (ARTR2)	30	38	NOPG	0.00029299
2478	-107.216	41.668	6	8	56	48	61	55	Rabbitbrush (CHRYS9)	24	42	NOPG	0.00239112
2479	-107.208	41.666	4	0	49	38	38	42	Big sagebrush (ARTR2)	20	42	NOPG	0.02976322
2480	-107.207	41.664	6	8	60	0	0	20	Big sagebrush (ARTR2)	18	60	UNKN	0.72292154
2481	-107.190	41.676	5	6	52	34	64	50	Big sagebrush (ARTR2)	12	62	UNKN	0.34262907
2482	-107.197	41.679	3	0	38	0	0	13	Big sagebrush (ARTR2)	30	15	UNKN	0.00600484
2483	-107.202	41.681	10	10	59	55	56	57	Big sagebrush (ARTR2)	28	34	NOPG	0.00035684
2484	-107.209	41.679	7	4	58	47	54	53	Big sagebrush (ARTR2)	12	80	UNKN	0.62269431
2485	-107.210	41.678	10	9	51	44	43	46	Big sagebrush (ARTR2)	12	54	UNKN	0.29625406
2486	-107.210	41.679	8	20	32	46	45	41	Big sagebrush (ARTR2)	10	75	WYPG	0.87647883
2487	-107.211	41.678	5	6	42	33	59	45	Big sagebrush (ARTR2)	8	77	WYPG	0.90397849
2489	-107.208	41.674	30	0	40	49	39	43	Big sagebrush (ARTR2)	20	39	NOPG	0.02095159
2490	-107.207	41.673	6	0	48	51	61	53	Big sagebrush (ARTR2)	12	63	UNKN	0.28044944
2881	-107.234	41.673	12	9	51	56	55	54	Big sagebrush (ARTR2)	20	32	NOPG	0.00335949
2882	-107.193	41.658	4	17	53	0	0	18	Big sagebrush	28	58	UNKN	

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ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
									(ARTR2)				
3293	-107.165	41.704	15	25	49	36	54	46	Rabbitbrush (CHRYS9)	15	54	NOPG	0.15518059
3294	-107.178	41.665	9	3	43	43	42	43	Big sagebrush (ARTR2)	10	74	WYPG	0.84424169
3295	-107.165	41.704	3	12	60	33	46	46	Big sagebrush (ARTR2)	25	1	NOPG	0.00016365
3296	-107.155	41.688	2	25	37	42	49	43	Big sagebrush (ARTR2)	15	60	UNKN	0.3126699
3297	-107.153	41.689	12	20	58	54	59	57	Saltbush (ATRIP))	12	36	NOPG	0.02696711
3696	-107.222	41.689	8	18	40	37	0	26	Serviceberry (AMELA)	4	20	UNKN	0.67091654
3697	-107.212	41.693	4	8	41	0	0	14	Big sagebrush (ARTR2)	22	34	UNKN	0.17684561
3698	-107.227	41.692	15	50	41	40	41	41	Big sagebrush (ARTR2)	38	20	NOPG	4.8029E-05
3699	-107.176	41.692	6	5	43	43	48	45	Big sagebrush (ARTR2)	6	38	UNKN	0.3881568
3700	-107.237	41.690	2	11	47	51	50	49	Big sagebrush (ARTR2)	65	10	NOPG	6.3849E-09
3702	-107.246	41.687	1	8	47	50	49	49	Big sagebrush (ARTR2)	29	40	NOPG	0.00110185
3703	-107.242	41.683	2	9	46	47	47	47	Big sagebrush (ARTR2)	56	5	NOPG	6.1258E-08
3704	-107.241	41.684	3	12	55	51	53	53	Black sagebrush (ARNO4)	16	39	NOPG	0.01897082
3705	-107.164	41.713	7	10	43	39	46	43	Serviceberry (AMELA)	8	20	NOPG	0.09555092
3706	-107.169	41.717	5	20	45	47	47	46	Big sagebrush (ARTR2)	16	52	NOPG	0.1067923
3707	-107.170	41.717	10	30	39	45	39	41	Big sagebrush (ARTR2)	18	62	UNKN	0.22660176

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ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
3708	-107.220	41.705	6	6	45	45	41	44	Big sagebrush (ARTR2)	30	32	NOPG	0.0007647
3709	-107.224	41.713	7	10	47	39	40	42	Serviceberry (AMELA)	10	26	NOPG	0.09932027
3710	-107.223	41.713	4	5	44	42	40	42	Serviceberry (AMELA)	8	30	UNKN	0.20652509
3711	-107.180	41.714	6	10	40	38	38	39	Rabbitbrush (CHRYS9)	18	6	NOPG	0.00369355
3713	-107.172	41.715	4	8	44	43	43	43	Black sagebrush (ARNO4)	16	54	NOPG	0.16485579
4118	-107.199	41.700	3	6	40	40	39	40	Serviceberry (AMELA)	8	62	WYPG	0.82660193
4120	-107.203	41.716	6	3	39	41	41	40	Big sagebrush (ARTR2)	36	36	NOPG	0.00031737
4122	-107.197	41.717	12	4	42	44	45	44	Big sagebrush (ARTR2)	8	76	WYPG	0.90649184
4123	-107.199	41.717	13	8	41	42	37	40	Black sagebrush (ARNO4)	24	54	NOPG	0.03353031
4124	-107.200	41.717	4	10	46	44	42	44	Black sagebrush (ARNO4)	30	48	NOPG	0.00276099
4125	-107.236	41.727	5	29	55	56	52	54	Big sagebrush (ARTR2)	21	0	NOPG	0.0001768
4126	-107.204	41.711	2	4	42	0	0	14	Big sagebrush (ARTR2)	22	66	UNKN	0.74482506
4127	-107.210	41.712	12	4	40	0	0	13	Big sagebrush (ARTR2)	36	24	UNKN	0.00241525
4128	-107.230	41.720	10	7	0	0	0	0	Big sagebrush (ARTR2)	26	38	UNKN	0.32466829
4129	-107.222	41.725	4	14	47	40	43	43	Big sagebrush (ARTR2)	36	26	NOPG	9.9214E-05
4130	-107.217	41.728	8	6	41	45	0	29	Big sagebrush (ARTR2)	20	50	UNKN	0.20315893

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ID	Location		Mound Characteristics		Burrow Diameter (mm)				Dominant Vegetation Cover	Percent Sagebrush Cover	Percent Bare Ground	Predicted Species	Model Probability
	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
4131	-107.245	41.734	7	0	55	0	0	18	Big sagebrush (ARTR2)	25	56	UNKN	0.26247709
4132	-107.293	41.540	1	8	59	54	56	56	Big sagebrush (ARTR2)	12	56	NOPG	0.13503754
4133	-107.293	41.539	3	12	58	53	55	55	Big sagebrush (ARTR2)	8	63	UNKN	0.47246954
4134	-107.301	41.524	4	15	51	53	54	53	Big sagebrush (ARTR2)	65	2	NOPG	2.2682E-09
4532	-107.288	41.516	4	9	53	57	56	55	Gardners saltbush (ATGA)	6	46	UNKN	0.27128094
4533	-107.291	41.513	26	21	51	52	54	52	Big sagebrush (ARTR2)	18	36	NOPG	0.00949797
4534	-107.288	41.511	19	5	52	51	53	52	Gardners saltbush (ATGA)	5	64	UNKN	0.75727549
4535	-107.285	41.510	1	26	48	50	52	50	Gardners saltbush (ATGA)	0	67	WYPG	0.94930486
4536	-107.292	41.513	8	23	52	54	55	54	Big sagebrush (ARTR2)	19	15	NOPG	0.00111569
4537	-107.282	41.500	5	19	52	53	51	52	Big sagebrush (ARTR2)	14	64	UNKN	0.22474946
4538	-107.271	41.528	3	9	56	54	53	54	Gardners saltbush (ATGA)	8	70	UNKN	0.64122079
4539	-107.300	41.482	25	0	52	54	44	50	Snowberry (SYAL)	10	5	NOPG	0.00786451
4544	-107.288	41.511	19	0	39	39	39	39	Gardners saltbush (ATGA)	4	74	WYPG	0.9755125
4545	-107.290	41.513	12	6	35	38	41	38	Rabbitbrush (CHRYS9)	6	62	WYPG	0.90690355
4575	-107.210	41.570	3	4	0	0	0	0	Gardners saltbush (ATGA)	0	82	UNKN	0.99994289
4576	-107.203	41.570	4	4	45	0	0	15	Gardners saltbush (ATGA)	0	88	UNKN	0.99981345
4577	-107.198	41.570	30	15	43	36	39	39	Gardners saltbush	0	84	WYPG	0.99605151

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
									(ATGA)				
4578	-107.193	41.570	5	2	38	0	0	13	Gardners saltbush (ATGA)	0	90	UNKN	0.99987824
4579	-107.177	41.570	4	8	34	40	42	39	Gardners saltbush (ATGA)	0	88	WYPG	0.99736421
4953	-107.214	41.571	2	0	0	0	0	0	Black sagebrush (ARNO4)	40	38	UNKN	0.01179284
4954	-107.205	41.571	6	0	38	0	0	13	Shadscale	0	56	UNKN	0.99797778
4955	-107.203	41.571	8	6	39	39	0	26	Gardners saltbush (ATGA)	0	78	WYPG	0.99853962
4956	-107.190	41.571	11	6	37	41	36	38	Gardners saltbush (ATGA)	0	88	WYPG	0.99755338
4957	-107.163	41.571	3	0	0	0	0	0	Gardners saltbush (ATGA)	0	86	UNKN	0.99995897
4960	-107.142	41.612	1	2	0	0	0	0	Big sagebrush (ARTR2)	15	70	UNKN	0.99198187
5353	-107.145	41.656	0	0	42	38	38	39	Rabbitbrush (CHRY9)	0	26	UNKN	0.67565321
5354	-107.140	41.643	7	44	45	51	48	48	Rabbitbrush (CHRY9)	20	12	NOPG	0.00126099
5355	-107.145	41.656	10	5	44	39	41	41	Big sagebrush (ARTR2)	20	31	NOPG	0.01265917
5356	-107.139	41.644	8	40	42	41	48	44	Rabbitbrush (CHRY9)	20	16	NOPG	0.00284749
5357	-107.144	41.662	7	8	42	41	47	43	Big sagebrush (ARTR2)	15	53	NOPG	0.19135443
5358	-107.137	41.667	11	6	41	49	31	40	Big sagebrush (ARTR2)	35	3	NOPG	2.6984E-05
5359	-107.135	41.668	5	8	42	0	0	14	Big sagebrush (ARTR2)	15	5	UNKN	0.10664295
5361	-107.135	41.668	5	10	43	39	41	41	Big sagebrush (ARTR2)	30	3	NOPG	9.3739E-05

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
5753	-107.258	41.736	7	36	56	54	54	55	Big sagebrush (ARTR2)	38	0	NOPG	1.9152E-06
5754	-107.258	41.734	7	29	52	53	54	53	Big sagebrush (ARTR2)	32	20	NOPG	5.8818E-05
5755	-107.259	41.736	8	24	58	54	57	56	Big sagebrush (ARTR2)	22	10	NOPG	0.00024812
5756	-107.168	41.725	8	8	42	0	0	14	Horsebrush (TETRA3)	0	36	UNKN	0.98784998
5758	-107.251	41.741	8	49	53	51	54	53	Big sagebrush (ARTR2)	42	4	NOPG	1.1603E-06
5759	-107.250	41.741	3	15	52	54	51	52	Big sagebrush (ARTR2)	28	23	NOPG	0.00023347
5761	-107.165	41.704	10	25	45	47	50	47	Big sagebrush (ARTR2)	36	8	NOPG	1.4307E-05
5762	-107.248	41.734	5	23	52	54	55	54	Big sagebrush (ARTR2)	17	47	NOPG	0.02601388
5763	-107.246	41.733	8	31	55	53	53	54	Big sagebrush (ARTR2)	32	47	NOPG	0.00050889
5764	-107.258	41.712	6	8	52	0	0	17	Big sagebrush (ARTR2)	30	18	UNKN	0.00456967
5765	-107.254	41.727	5	17	53	54	53	53	Big sagebrush (ARTR2)	34	22	NOPG	3.943E-05
5766	-107.216	41.668	4	10	38	34	0	24	Big sagebrush (ARTR2)	36	16	NOPG	0.00037817
5767	-107.242	41.710	17	26	49	51	52	51	Big sagebrush (ARTR2)	22	37	NOPG	0.00434763
5768	-107.218	41.678	2	11	39	42	33	38	Big sagebrush (ARTR2)	50	12	NOPG	1.4062E-06
5769	-107.212	41.678	12	42	42	44	56	47	Big sagebrush (ARTR2)	22	8	NOPG	0.00057605
5770	-107.245	41.710	17	34	58	56	53	56	Big sagebrush (ARTR2)	38	2	NOPG	2.0203E-06

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
5771	-107.211	41.679	3	18	44	41	42	42	Big sagebrush (ARTR2)	34	10	NOPG	5.0105E-05
5772	-107.214	41.677	4	9	42	41	53	45	Big sagebrush (ARTR2)	12	66	UNKN	0.55029599
5773	-107.248	41.714	6	32	55	52	56	54	Big sagebrush (ARTR2)	22	16	NOPG	0.00050972
5774	-107.226	41.677	5	20	39	42	41	41	Rabbitbrush (CHRYS9)	20	28	NOPG	0.01066499
5775	-107.228	41.676	6	30	43	39	33	38	Big sagebrush (ARTR2)	32	28	NOPG	0.00058886
5776	-107.230	41.674	5	30	30	35	50	38	Rabbitbrush (CHRYS9)	10	38	UNKN	0.30965486
5777	-107.229	41.674	15	27	46	42	41	43	Rabbitbrush (CHRYS9)	18	10	NOPG	0.00316636
5778	-107.231	41.674	6	12	42	55	32	43	Rabbitbrush (CHRYS9)	20	30	NOPG	0.00969887
5779	-107.253	41.716	11	29	56	55	52	54	Serviceberry (AMELA)	24	1	NOPG	8.699E-05
5781	-107.231	41.674	10	30	245	50	47	114	Big sagebrush (ARTR2)	45	23	NOPG	2.6284E-09
5782	-107.233	41.674	16	35	39	42	43	41	Big sagebrush (ARTR2)	30	24	NOPG	0.00051258
5783	-107.232	41.674	7	20	40	37	40	39	Big sagebrush (ARTR2)	36	22	NOPG	0.00011579
5784	-107.235	41.675	6	6	0	0	0	0	Big sagebrush (ARTR2)	40	32	UNKN	0.00721322
5785	-107.235	41.675	8	26	34	42	35	37	Big sagebrush (ARTR2)	40	48	NOPG	0.00043254
5786	-107.233	41.675	6	12	34	37	35	35	Big sagebrush (ARTR2)	22	38	NOPG	0.02573746
5787	-107.250	41.718	8	27	56	53	52	54	Big sagebrush (ARTR2)	39	5	NOPG	2.4877E-06

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
5790	-107.249	41.717	17	32	54	55	53	54	Big sagebrush (ARTR2)	52	8	NOPG	9.9272E-08
6166	-107.232	41.666	5	2	49	49	0	33	Big sagebrush (ARTR2)	15	41	UNKN	0.2246159
6167	-107.228	41.692	11	21	51	49	53	51	Serviceberry (AMELA)	4	14	NOPG	0.06778642
6168	-107.232	41.666	6	8	46	54	41	47	Big sagebrush (ARTR2)	25	20	NOPG	0.00073054
6169	-107.225	41.692	19	11	50	52	53	52	Big sagebrush (ARTR2)	18	5	NOPG	0.00079516
6170	-107.225	41.692	23	11	52	54	51	52	Serviceberry (AMELA)	29	1	NOPG	2.9074E-05
6171	-107.216	41.668	4	8	69	38	0	36	Big sagebrush (ARTR2)	18	47	NOPG	0.13345304
6172	-107.223	41.692	9	17	52	55	53	53	Big sagebrush (ARTR2)	15	5	NOPG	0.00145567
6173	-107.212	41.665	1	1	49	0	0	16	Big sagebrush (ARTR2)	18	41	UNKN	0.44976176
6175	-107.196	41.670	3	5	55	34	52	47	Big sagebrush (ARTR2)	25	32	NOPG	0.00196833
6177	-107.195	41.669	10	25	48	41	0	30	Big sagebrush (ARTR2)	25	20	NOPG	0.00506831
6178	-107.217	41.694	13	21	53	52	55	53	Big sagebrush (ARTR2)	32	12	NOPG	2.924E-05
6179	-107.195	41.670	12	18	56	46	48	50	Big sagebrush (ARTR2)	30	32	NOPG	0.00037636
6576	-107.222	41.714	6	27	51	53	56	53	Big sagebrush (ARTR2)	38	18	NOPG	9.8529E-06
6577	-107.173	41.714	18	9	42	65	58	55	Big sagebrush (ARTR2)	15	17	NOPG	0.00325241
6578	-107.174	41.717	5	6	63	47	45	52	Big sagebrush (ARTR2)	15	48	NOPG	0.05797245

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
6579	-107.222	41.716	16	41	52	50	53	52	Big sagebrush (ARTR2)	39	1	NOPG	2.2357E-06
6580	-107.174	41.718	15	75	55	46	36	46	Horsebrush (TETRA3)	5	18	NOPG	0.12378485
6581	-107.177	41.719	5	30	53	58	55	55	Big sagebrush (ARTR2)	20	23	NOPG	0.00137733
6583	-107.230	41.719	5	19	51	50	54	52	Big sagebrush (ARTR2)	22	44	NOPG	0.00691676
6584	-107.235	41.721	2	11	50	51	48	50	Big sagebrush (ARTR2)	38	10	NOPG	7.6663E-06
6585	-107.174	41.711	2	5	48	52	50	50	Mountain Mahogany	10	0	NOPG	0.00521494
6978	-107.174	41.681	3	1	62	57	0	59	Big sagebrush (ARTR2)	8	76	UNKN	0.93816947
6979	-107.175	41.682	11	15	52	56	64	57	Big sagebrush (ARTR2)	15	30	NOPG	0.00730885
6980	-107.181	41.672	8	21	52	50	54	52	Big sagebrush (ARTR2)	52	2	NOPG	7.5616E-08
6981	-107.182	41.670	7	2	0	0	0	0	Big sagebrush (ARTR2)	34	2	UNKN	0.00295411
6982	-107.183	41.669	14	9	0	0	0	0	Big sagebrush (ARTR2)	28	12	UNKN	0.03196583
6983	-107.184	41.666	7	24	49	53	52	51	Big sagebrush (ARTR2)	23	20	NOPG	0.00076236
6984	-107.173	41.685	7	9	66	49	65	60	Big sagebrush (ARTR2)	25	16	NOPG	0.00012244
6986	-107.166	41.686	4	32	52	70	62	61	Big sagebrush (ARTR2)	15	4	NOPG	0.00054754
6988	-107.165	41.686	6	26	51	62	67	60	Big sagebrush (ARTR2)	7	27	NOPG	0.03402311
6989	-107.163	41.687	4	5	53	60	55	56	Big sagebrush (ARTR2)	15	5	NOPG	0.00108023
6990	-107.183	41.674	16	12	45	47	47	46	Rabbitbrush	8	12	NOPG	0.03489365

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
									(CHRYS9)				
6991	-107.183	41.674	17	24	46	51	51	49	Rabbitbrush (CHRYS9)	29	10	NOPG	8.5635E-05
6992	-107.175	41.678	9	26	53	50	52	52	Big sagebrush (ARTR2)	31	10	NOPG	3.8893E-05
6993	-107.197	41.671	7	5	0	0	0	0	Big sagebrush (ARTR2)	8	54	UNKN	0.9952403
6994	-107.188	41.700	2	5	0	0	0	0	Big sagebrush (ARTR2)	20	64	UNKN	
6995	-107.182	41.672	6	17	48	51	50	50	Big sagebrush (ARTR2)	38	0	NOPG	3.3529E-06
6996	-107.205	41.682	5	3	45	55	43	48	Big sagebrush (ARTR2)	18	46	NOPG	0.0356582
6998	-107.217	41.713	7	19	51	50	49	50	Big sagebrush (ARTR2)	16	19	NOPG	0.00514946
6999	-107.210	41.712	6	22	52	53	50	52	Big sagebrush (ARTR2)	32	10	NOPG	2.9869E-05
7000	-107.215	41.713	4	17	52	53	50	52	Big sagebrush (ARTR2)	36	22	NOPG	2.8028E-05
7001	-107.208	41.715	13	38	53	54	51	53	Mountain Mahogany	36	3	NOPG	5.2067E-06
7002	-107.205	41.715	7	22	53	55	52	53	Big sagebrush (ARTR2)	16	30	NOPG	0.0087724
7003	-107.202	41.716	5	17	54	53	52	53	Big sagebrush (ARTR2)	19	44	NOPG	0.01307103
7007	-107.312	41.522	11	26	54	56	53	54	Big sagebrush (ARTR2)	12	8	NOPG	0.00367422
7008	-107.310	41.522	14	9	53	52	55	53	Big sagebrush (ARTR2)	13	8	NOPG	0.00315775
7009	-107.309	41.522	23	16	51	52	50	51	Big sagebrush (ARTR2)	57	-20	NOPG	3.6629E-09
7010	-107.306	41.523	8	11	51	50	48	50	Big sagebrush (ARTR2)	32	6	NOPG	2.6843E-05

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
7011	-107.307	41.523	11	15	48	51	49	49	Big sagebrush (ARTR2)	23	12	NOPG	0.000492298
7012	-107.234	41.687	2	2	27	69	0	32	Big sagebrush (ARTR2)	15	61	UNKN	0.62003576
7013	-107.309	41.523	7	19	49	52	55	52	Big sagebrush (ARTR2)	31	26	NOPG	0.00014069
7014	-107.324	41.523	9	20	56	60	62	59	None (Woodland/grass/forb)	0	-23	NOPG	0.003840008
7015	-107.172	41.682	5	15	46	34	0	27	Big sagebrush (ARTR2)	15	48	UNKN	0.5029833
7016	-107.175	41.682	20	25	58	59	54	57	Big sagebrush (ARTR2)	20	51	NOPG	0.01146075
7017	-107.181	41.683	5	12	62	43	39	48	Big sagebrush (ARTR2)	25	37	NOPG	0.00265911
7398	-107.200	41.720	14	22	53	62	66	60	Big sagebrush (ARTR2)	20	0	NOPG	0.00011757
7401	-107.212	41.723	5	16	64	68	65	66	Big sagebrush (ARTR2)	10	5	NOPG	0.00136919
7402	-107.339	41.528	2	12	55	58	53	55	Big sagebrush (ARTR2)	16	17	NOPG	0.00240828
7403	-107.345	41.531	23	9	53	55	54	54	Big sagebrush (ARTR2)	11	11	NOPG	0.00634767
7404	-107.343	41.530	21	6	58	55	55	56	Big sagebrush (ARTR2)	14	4	NOPG	0.00129468
7405	-107.357	41.537	16	19	49	52	51	51	Big sagebrush (ARTR2)	9	24	NOPG	0.04407163
7406	-107.372	41.543	26	42	56	58	53	56	Mountain Mahogany	6	16	NOPG	0.02912879
7407	-107.289	41.447	25	20	41	51	54	49	Big sagebrush (ARTR2)	15	25	NOPG	0.01269004
7408	-107.308	41.474	2	1	68	0	0	23	Big sagebrush (ARTR2)	18	28	UNKN	0.12067361
7416	-107.366	41.525	9	17	52	55	53	53	Big sagebrush	11	9	NOPG	0.00580027

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
									(ARTR2)				
7808	-107.277	41.460	6	25	63	60	68	64	Mountain Mahogany	2	6	NOPG	0.01516526
7810	-107.275	41.454	4	10	55	58	62	58	Big sagebrush (ARTR2)	8	19	NOPG	0.01654426
7811	-107.275	41.455	8	15	63	65	54	61	Big sagebrush (ARTR2)	20	12	NOPG	0.0003055
7812	-107.258	41.450	10	8	42	38	40	40	Black sagebrush (ARNO4)	12	54	UNKN	0.45184968
7813	-107.328	41.485	8	12	52	67	68	62	Black sagebrush (ARNO4)	2	58	UNKN	0.56863071
8218	-107.334	41.485	6	28	65	50	52	56	Big sagebrush (ARTR2)	40	9	NOPG	2.1258E-06
8221	-107.303	41.522	4	8	0	0	0	0	Serviceberry (AMELA)	6	34	UNKN	0.98546852
8222	-107.333	41.480	7	40	50	50	55	52	Big sagebrush (ARTR2)	15	8	NOPG	0.00224665
9010	-107.249	41.734	7	19	56	57	55	56	Big sagebrush (ARTR2)	17	26	NOPG	0.00360867
9011	-107.247	41.733	9	18	53	56	57	55	Big sagebrush (ARTR2)	19	50	NOPG	0.01647444
9014	-107.231	41.675	4	6	68	64	63	65	Big sagebrush (ARTR2)	22	8	NOPG	7.9681E-05
9015	-107.196	41.712	12	9	55	54	57	55	Big sagebrush (ARTR2)	14	47	NOPG	0.04664448
9016	-107.215	41.676	12	10	0	0	0	0	Big sagebrush (ARTR2)	32	4	UNKN	0.00589229
9018	-107.214	41.676	16	21	61	0	0	20	Big sagebrush (ARTR2)	26	18	UNKN	0.00934307
9019	-107.226	41.694	8	13	54	53	57	55	Big sagebrush (ARTR2)	22	37	NOPG	0.00278209
9020	-107.190	41.658	12	4	66	0	0	22	Big sagebrush (ARTR2)	36	24	UNKN	0.00091635

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
9021	-107.191	41.668	8	14	52	56	50	53	Rabbitbrush (CHRY9)	18	28	NOPG	0.00474425
9024	-107.177	41.682	12	10	61	60	0	40	Big sagebrush (ARTR2)	4	14	NOPG	0.19363941
9025	-107.183	41.685	12	10	0	0	0	0	Big sagebrush (ARTR2)	32	38	UNKN	0.0897738
9026	-107.234	41.686	7	11	55	58	59	57	Big sagebrush (ARTR2)	36	12	NOPG	6.4985E-06
9413	-107.213	41.713	7	17	51	53	54	53	Big sagebrush (ARTR2)	19	46	NOPG	0.015961795
9415	-107.204	41.716	7	16	52	51	55	53	Big sagebrush (ARTR2)	19	49	NOPG	0.02036491
9416	-107.201	41.719	11	17	49	52	50	50	Big sagebrush (ARTR2)	27	26	NOPG	0.0004873
9417	-107.194	41.686	10	6	43	44	0	29	Big sagebrush (ARTR2)	28	52	NOPG	0.03387552
9418	-107.151	41.688	4	12	0	0	0	0	Big sagebrush (ARTR2)	12	48	UNKN	0.97791664
9814	-107.139	41.684	8	17	39	43	42	41	Big sagebrush (ARTR2)	16	25	NOPG	0.02194915
9815	-107.138	41.683	8	10	39	41	40	40	Big sagebrush (ARTR2)	28	46	NOPG	0.00618884
9419	-107.156	41.690	10	8	39	0	0	13	Rabbitbrush (CHRY9)	26	18	NOPG	0.020991967
10213	-107.379	41.534	11	8	55	52	53	53	Big sagebrush (ARTR2)	8	15	NOPG	0.02071766
10614	-107.297	41.448	8	11	55	56	55	55	Big sagebrush (ARTR2)	56	7	NOPG	2.7381E-08
10615	-107.260	41.464	6	14	44	50	53	49	Mountain Mahogany	0	2	NOPG	0.08837819
10616	-107.258	41.464	10	21	58	50	55	54	Mountain Mahogany	4	5	NOPG	0.02322939
10617	-107.194	41.686	20	15	50	52	54	52	Big sagebrush (ARTR2)	20	65	NOPG	0.0606824

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	Latitude	Longitude	Fresh	Old	D1	D2	D3	Avg					
10618	-107.241	41.706	5	19	52	53	51	52	Big sagebrush (ARTR2)	22	1	NOPG	0.00019153
10619	-107.240	41.702	11	21	54	55	53	54	Big sagebrush (ARTR2)	26	19	NOPG	0.00023594
10620	-107.238	41.699	3	11	41	45	42	43	Big sagebrush (ARTR2)	28	20	NOPG	0.0005377
10621	-107.237	41.698	7	12	46	50	48	48	Big sagebrush (ARTR2)	29	25	NOPG	0.00034366
10623	-107.233	41.664	3	8	49	46	48	48	Big sagebrush (ARTR2)	16	56	WYPG	0.96378983
10810	-107.318	41.548	0	6	29	31	32	31	Big sagebrush (ARTR2)	24	10	NOPG	0.002587
11210	-107.304	41.522	14	68	47	49	46	47	None (woodland/grass/forb)	0	2	NOPG	0.1046181
11211	-107.308	41.525	14	40	39	41	42	41	None (woodland/grass/forb)	0	4	UNKN	0.2253308
11212	-107.305	41.477	5	11	40	44	42	42	Big sagebrush (ARTR2)	17	14	NOPG	0.006399

ND = not determined; WYPG = Wyoming pocket gopher; NOPG = northern pocket gopher; UNKN = unknown pocket gopher species

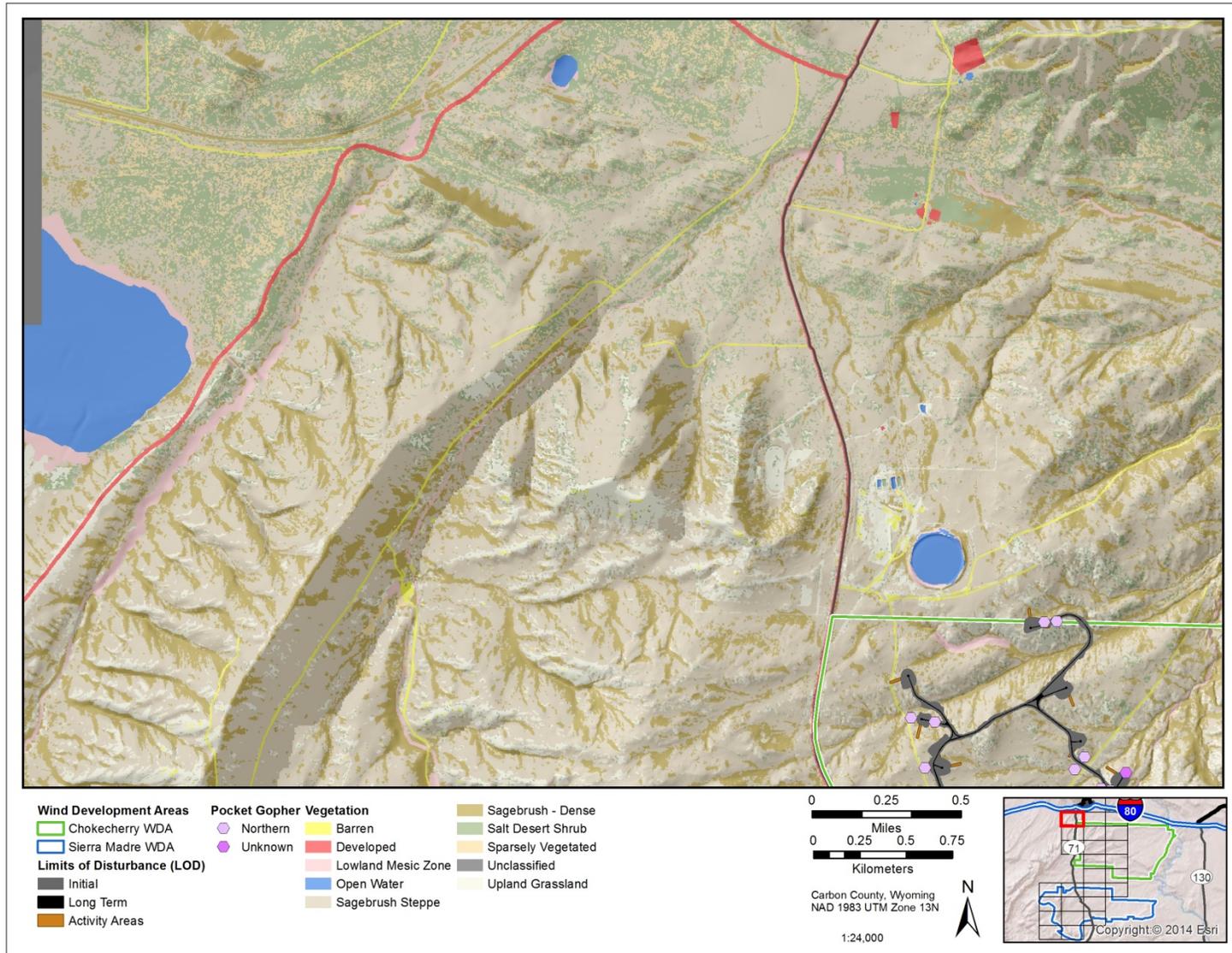


Figure A.1 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

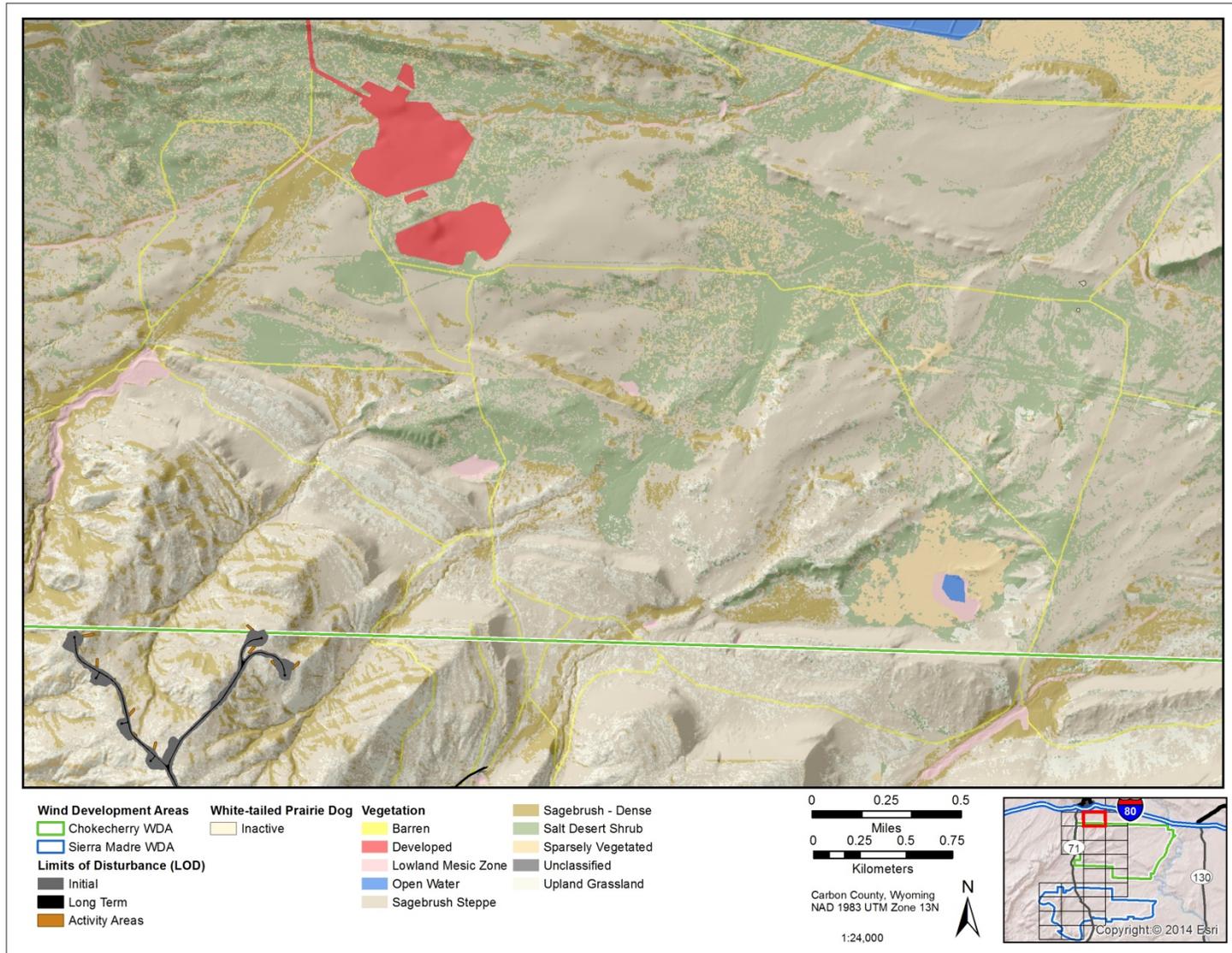


Figure A.2 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

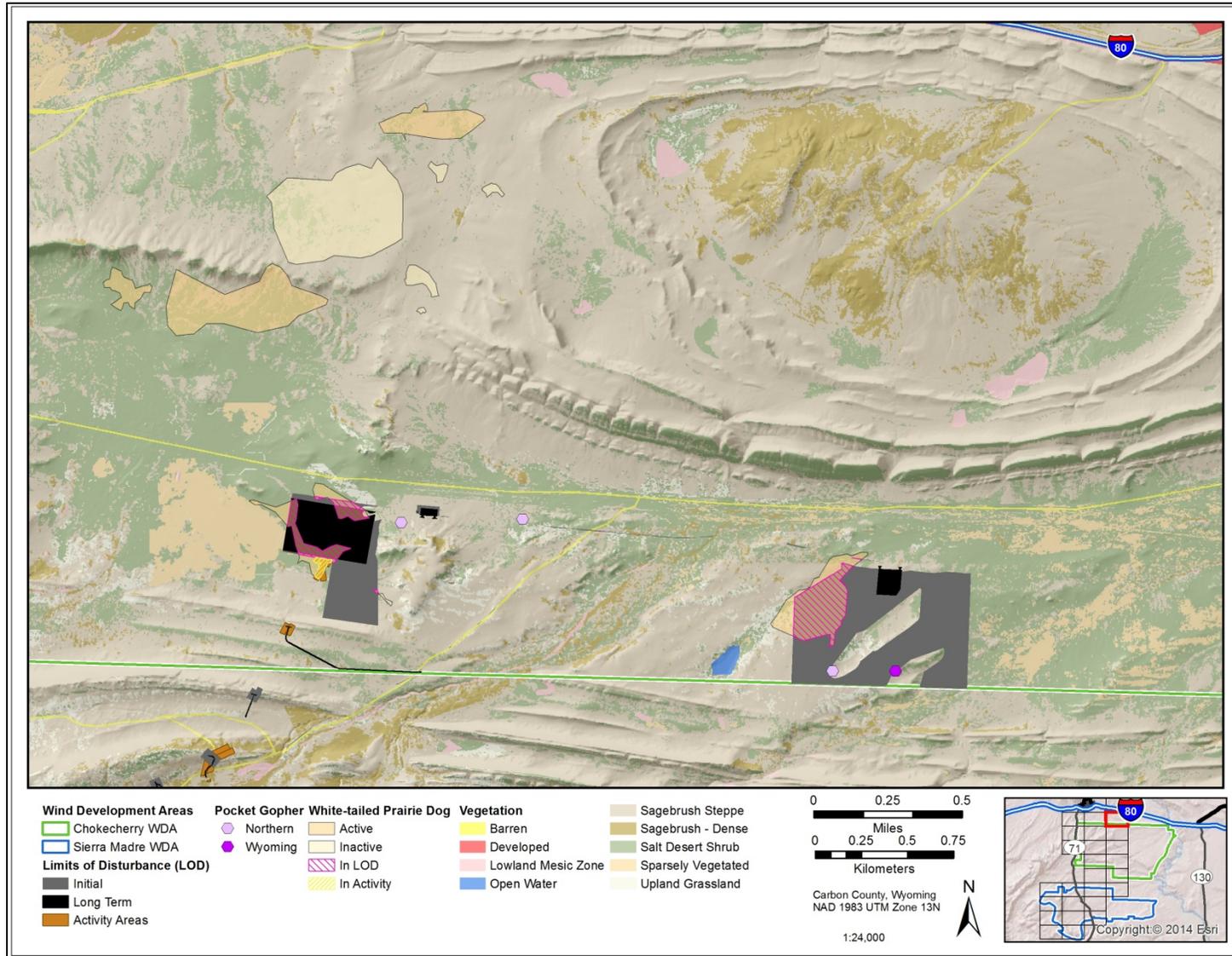


Figure A.3 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

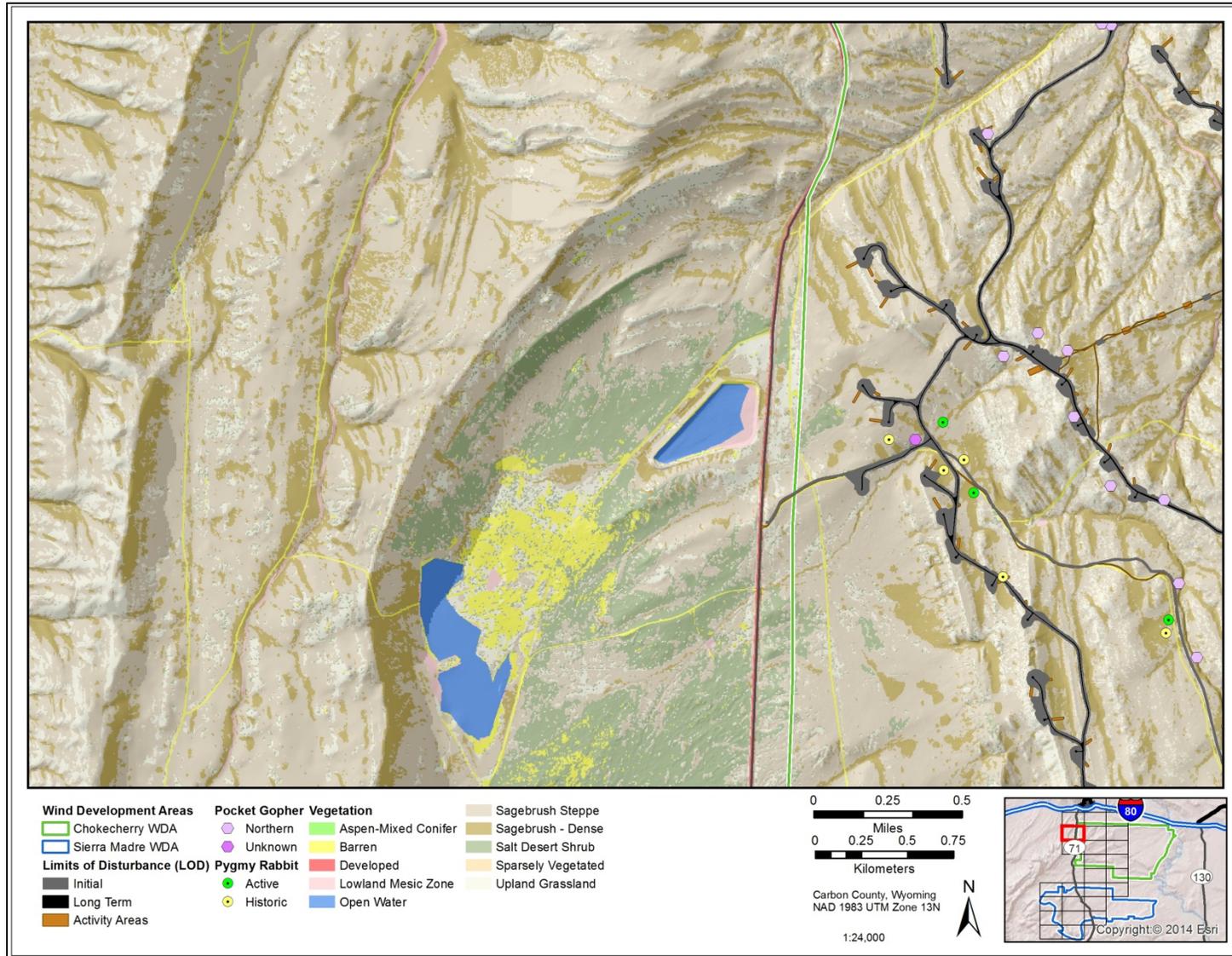


Figure A.4 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

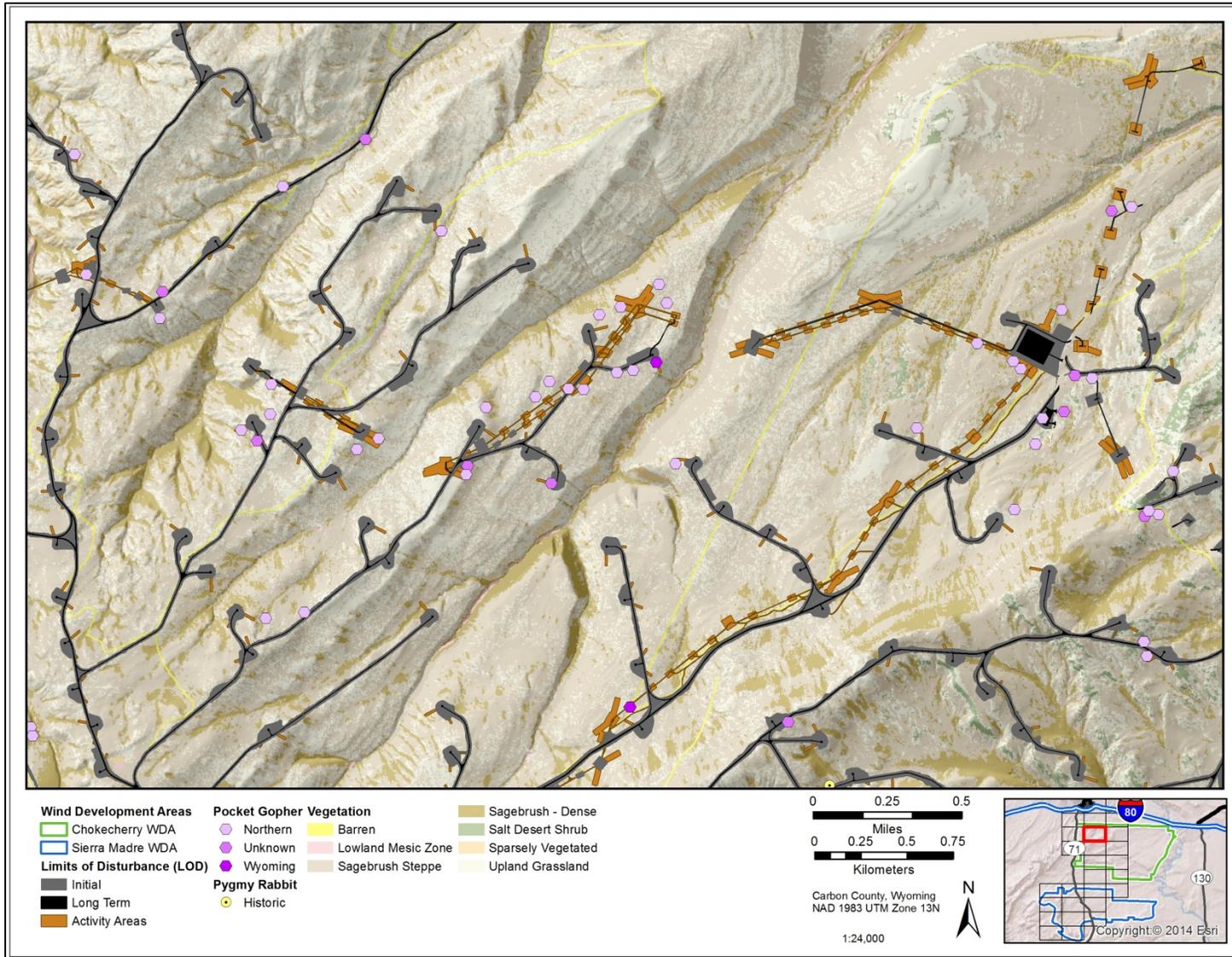


Figure A.5 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

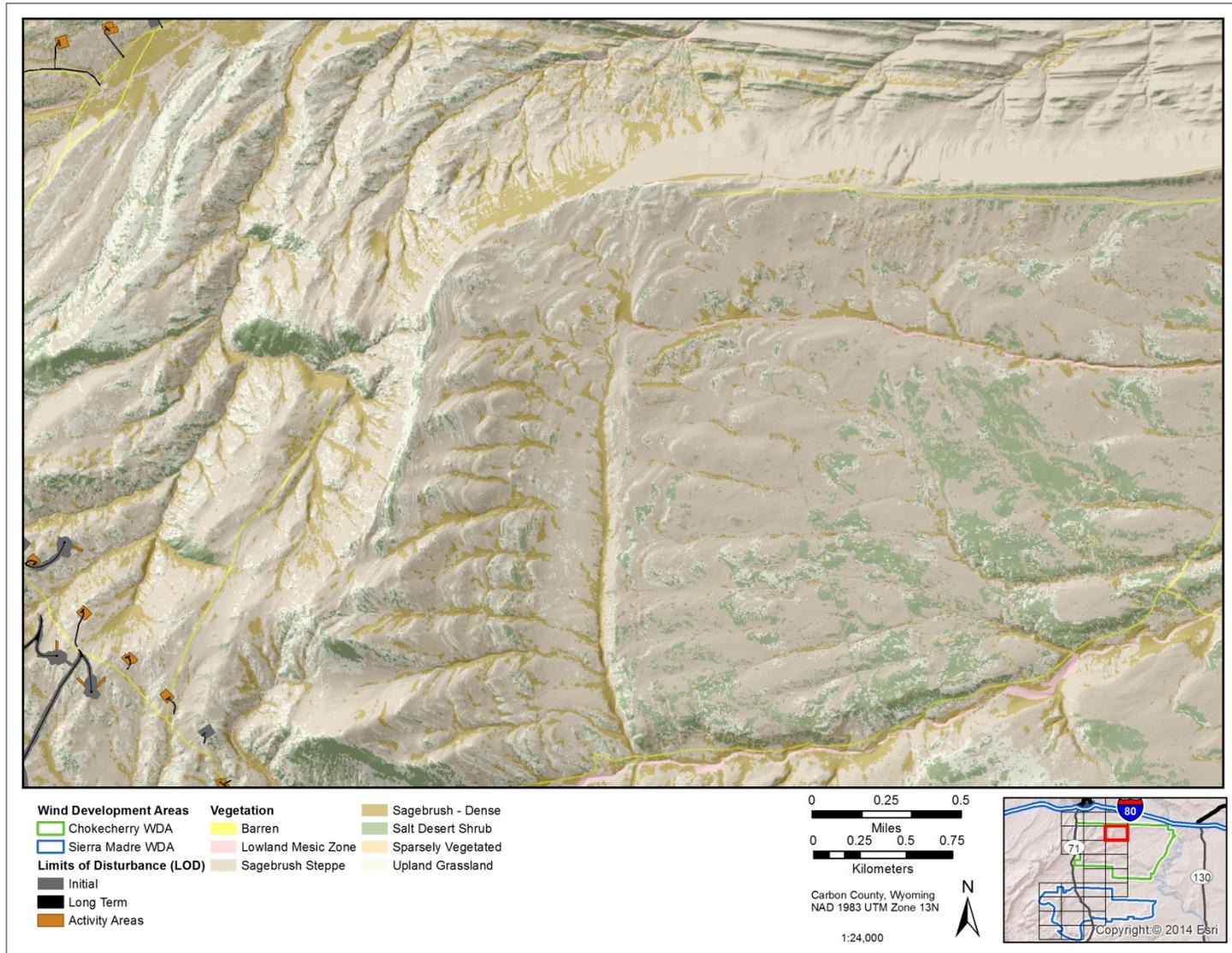


Figure A.6 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

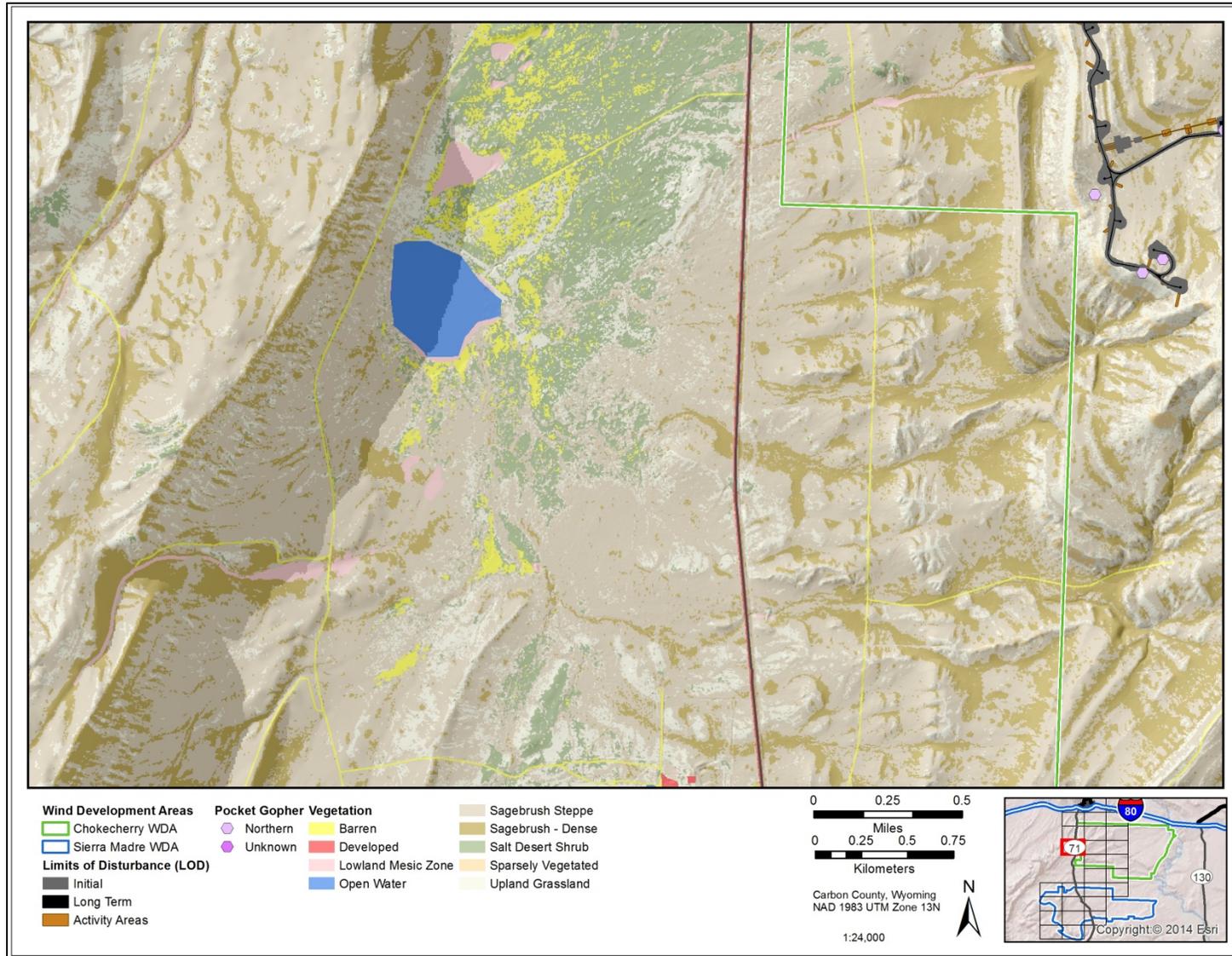


Figure A.7 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

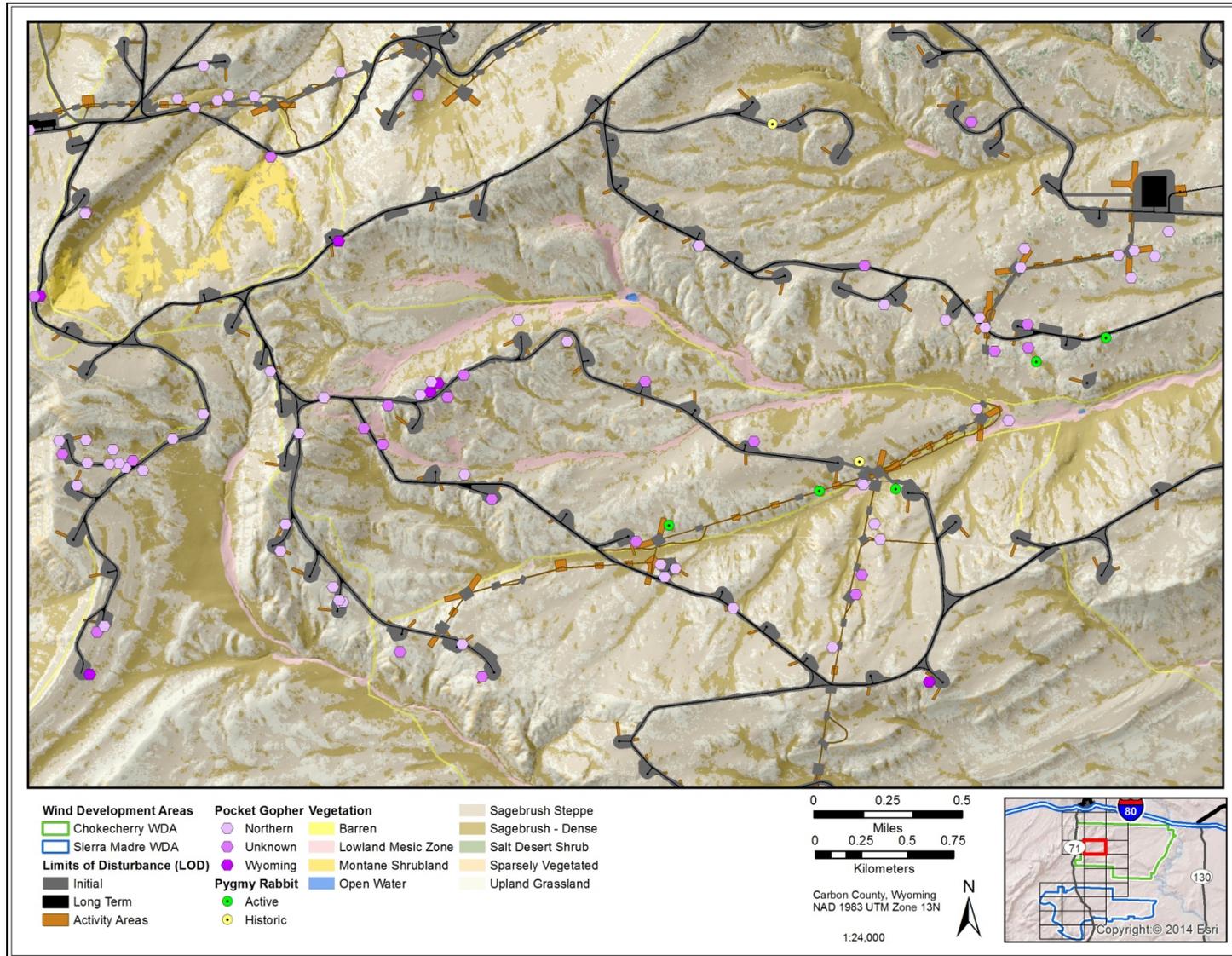


Figure A.8 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

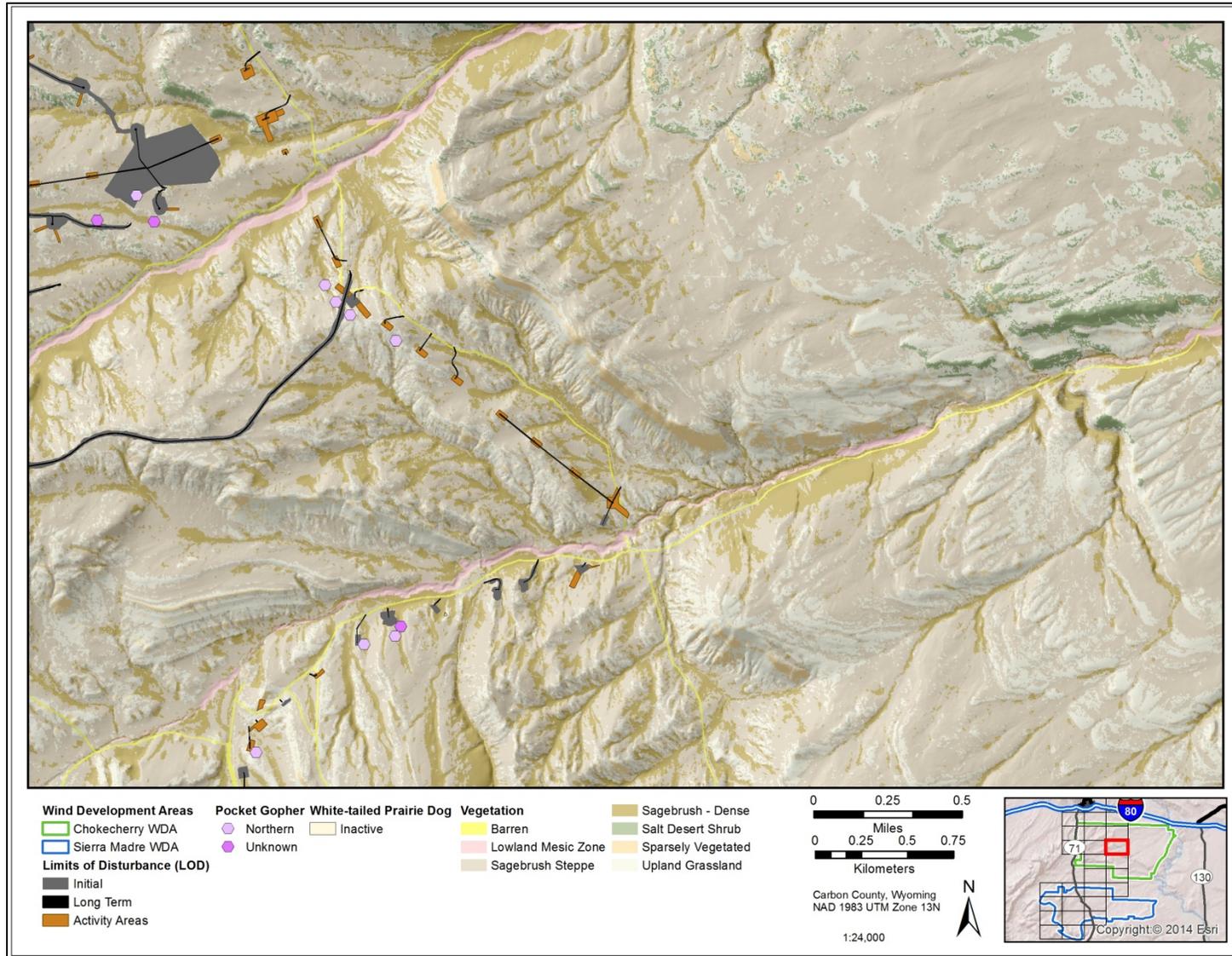


Figure A.9 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

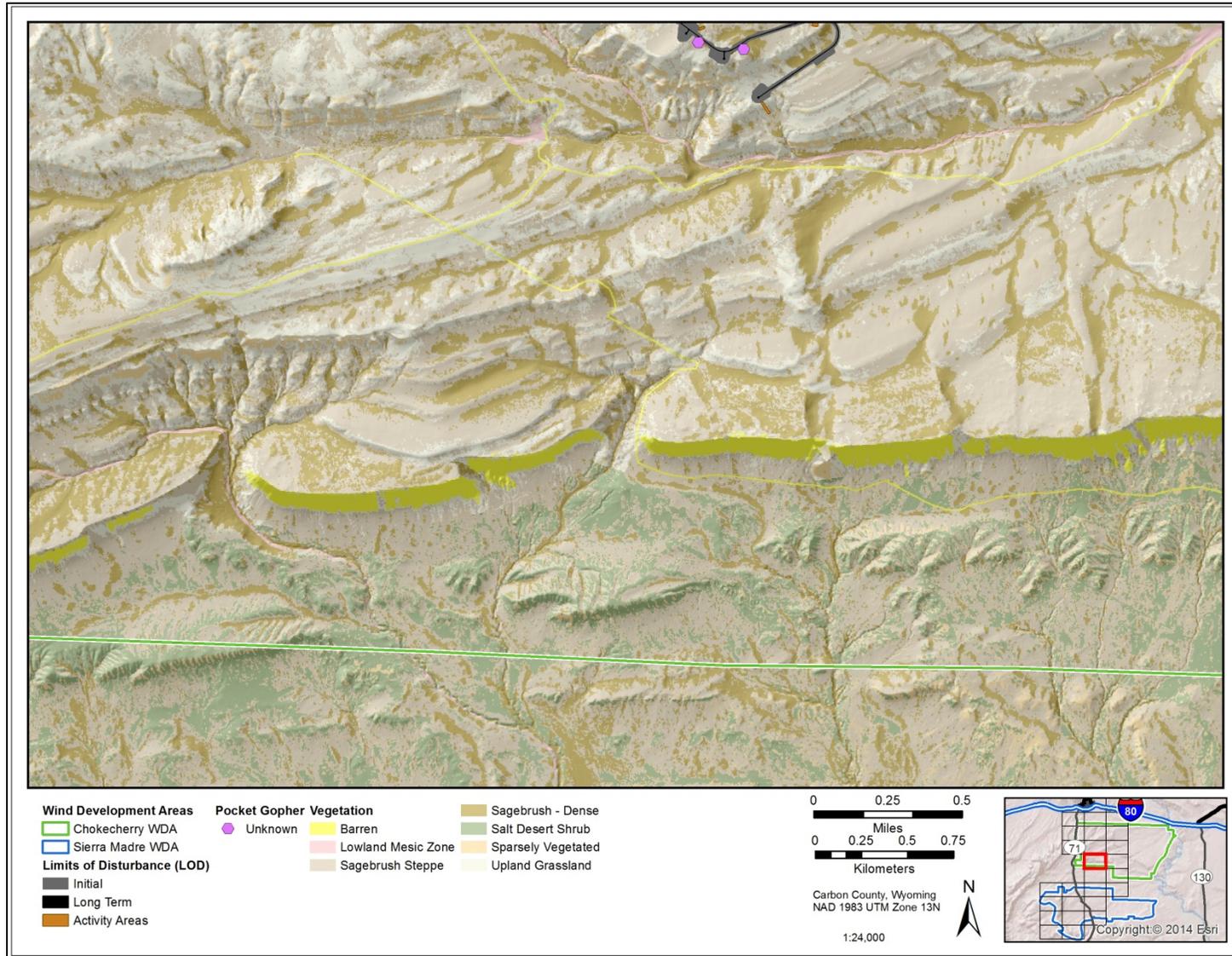


Figure A.10 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

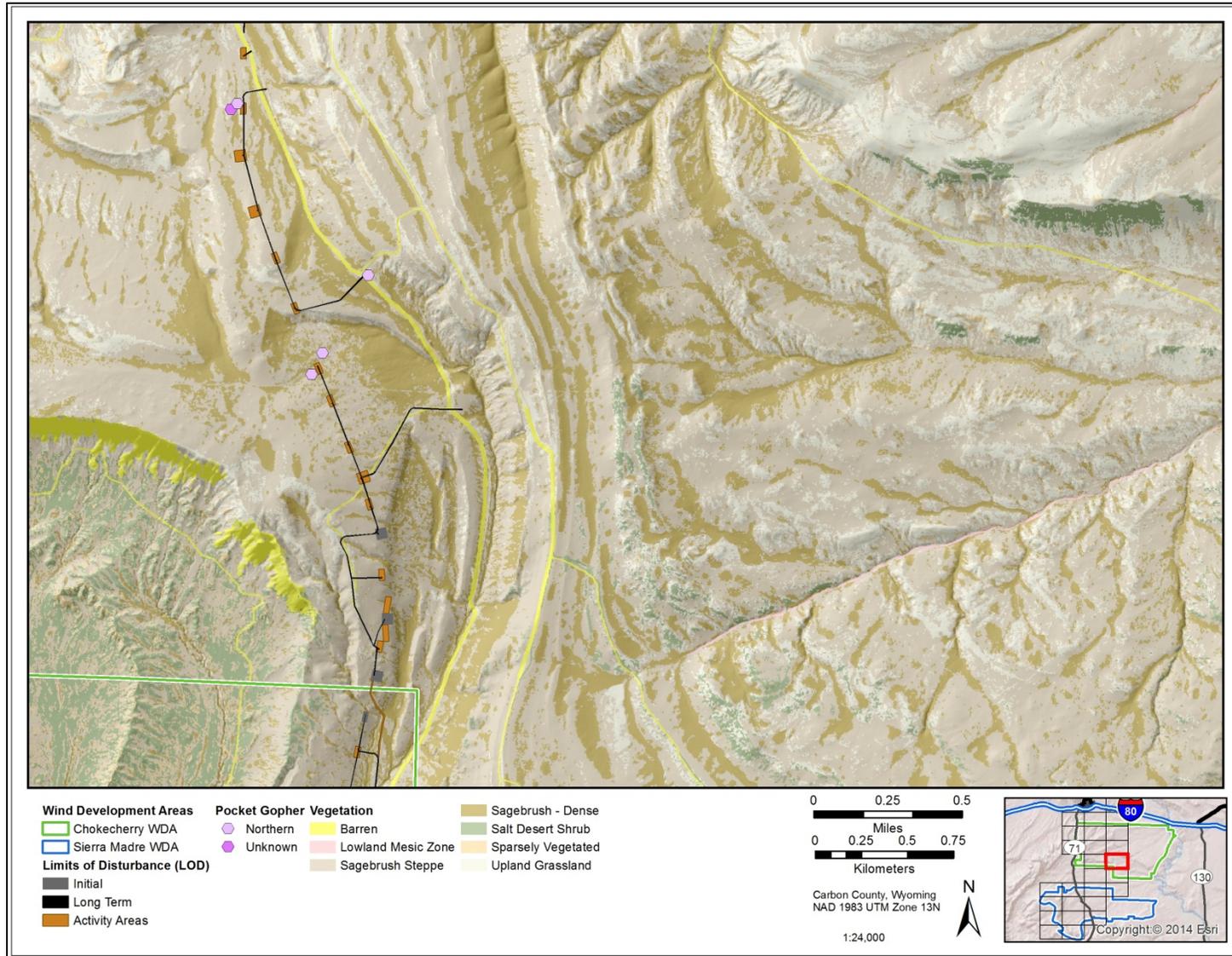


Figure A.11 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

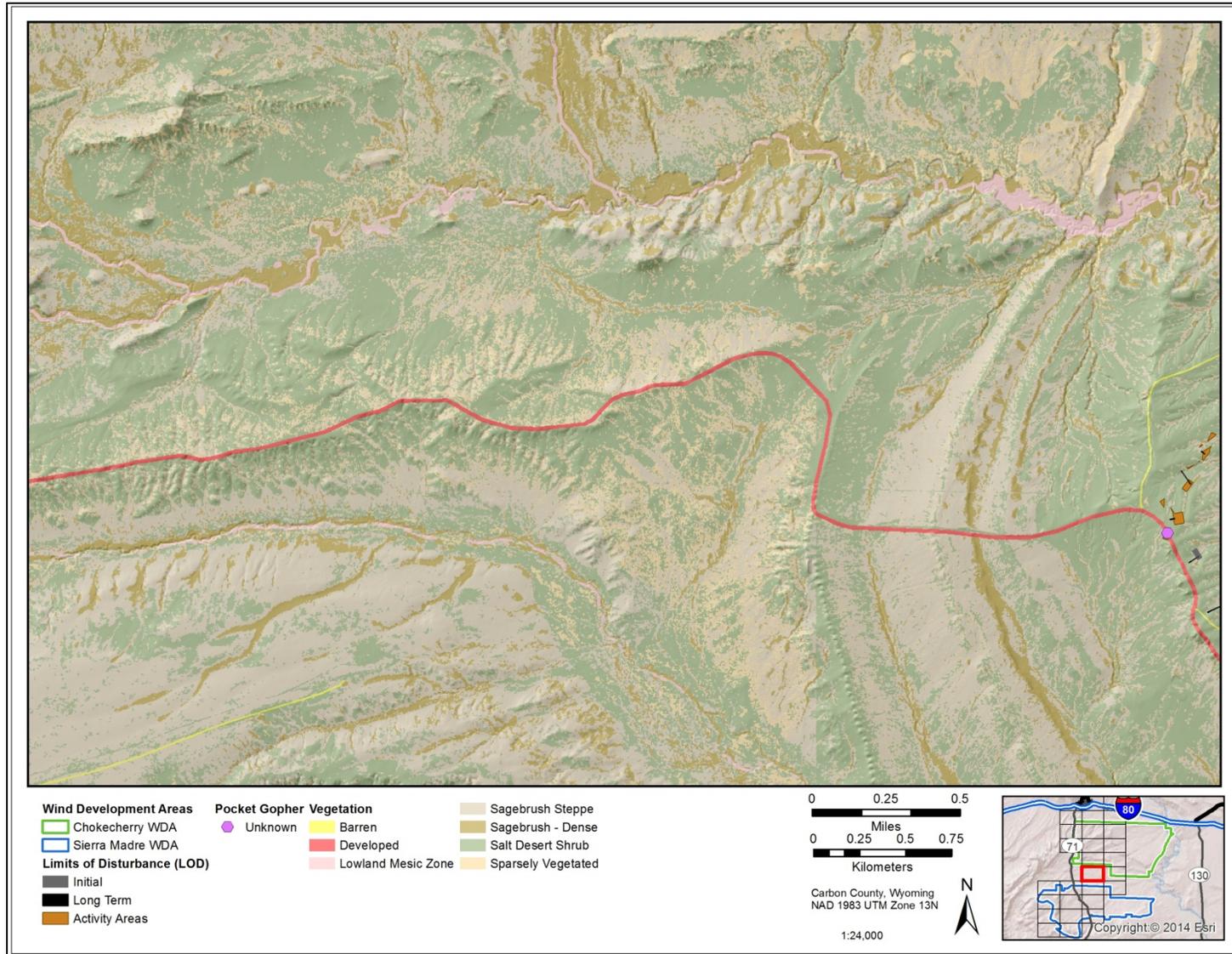


Figure A.12 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

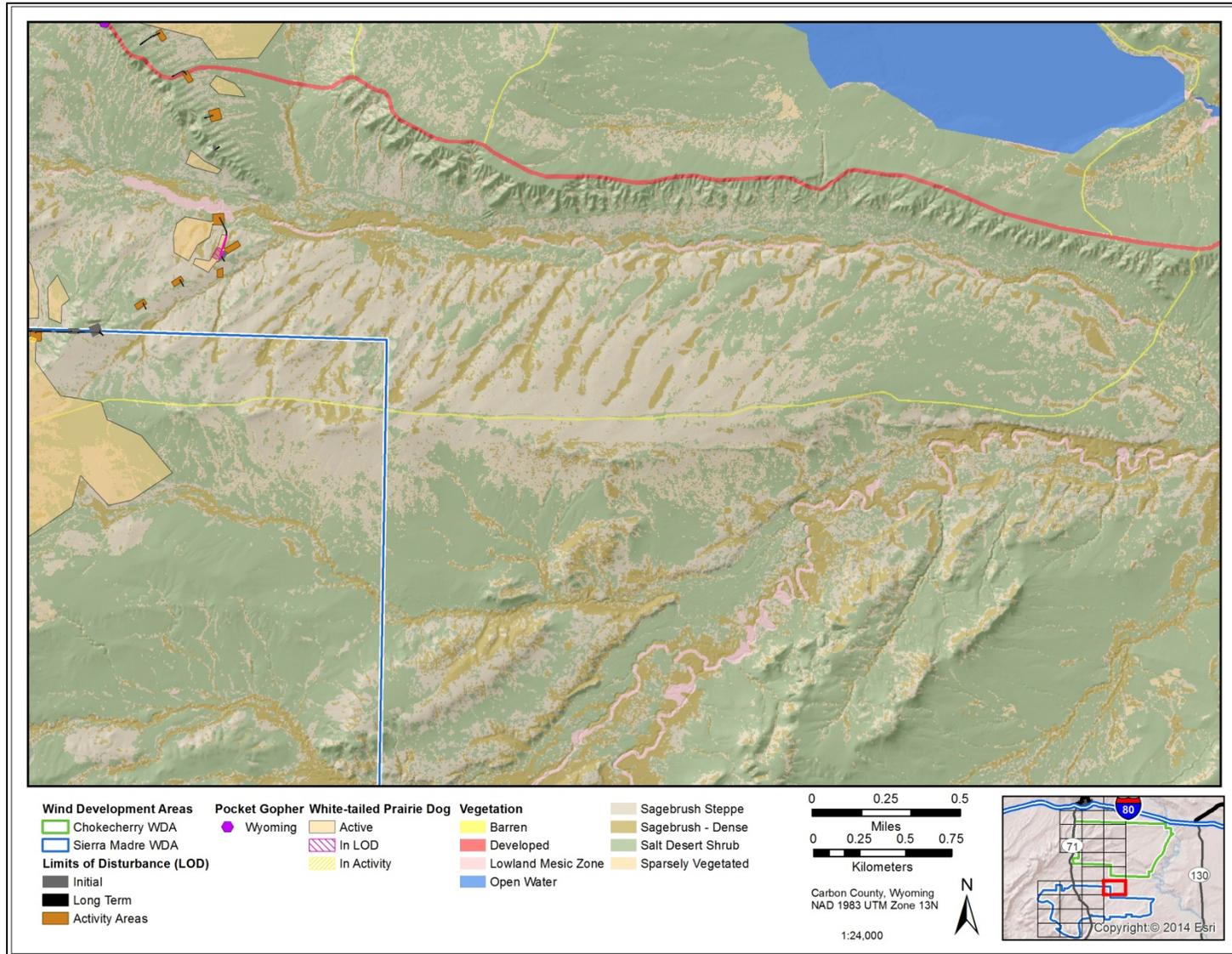


Figure A.13 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

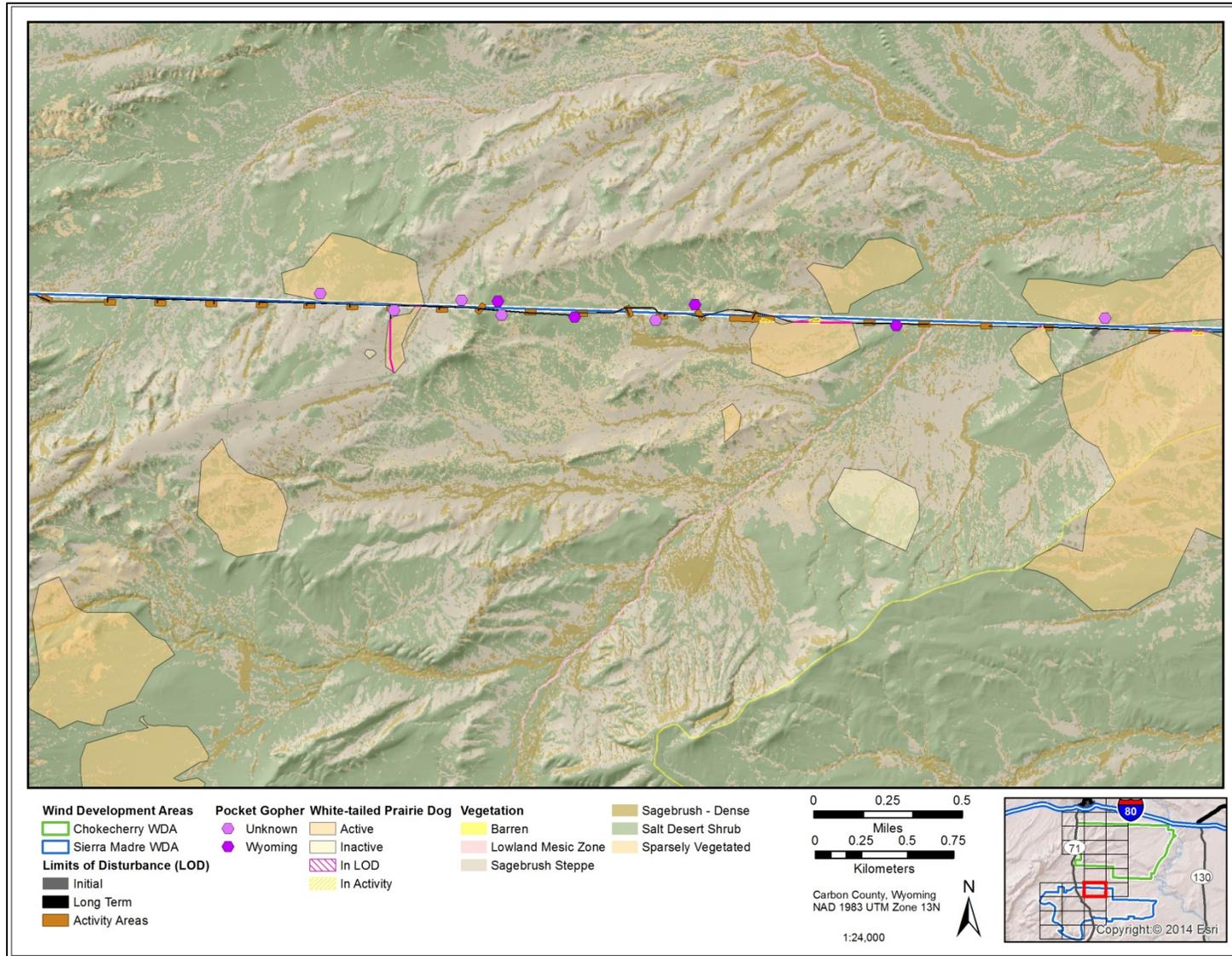


Figure A.14 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

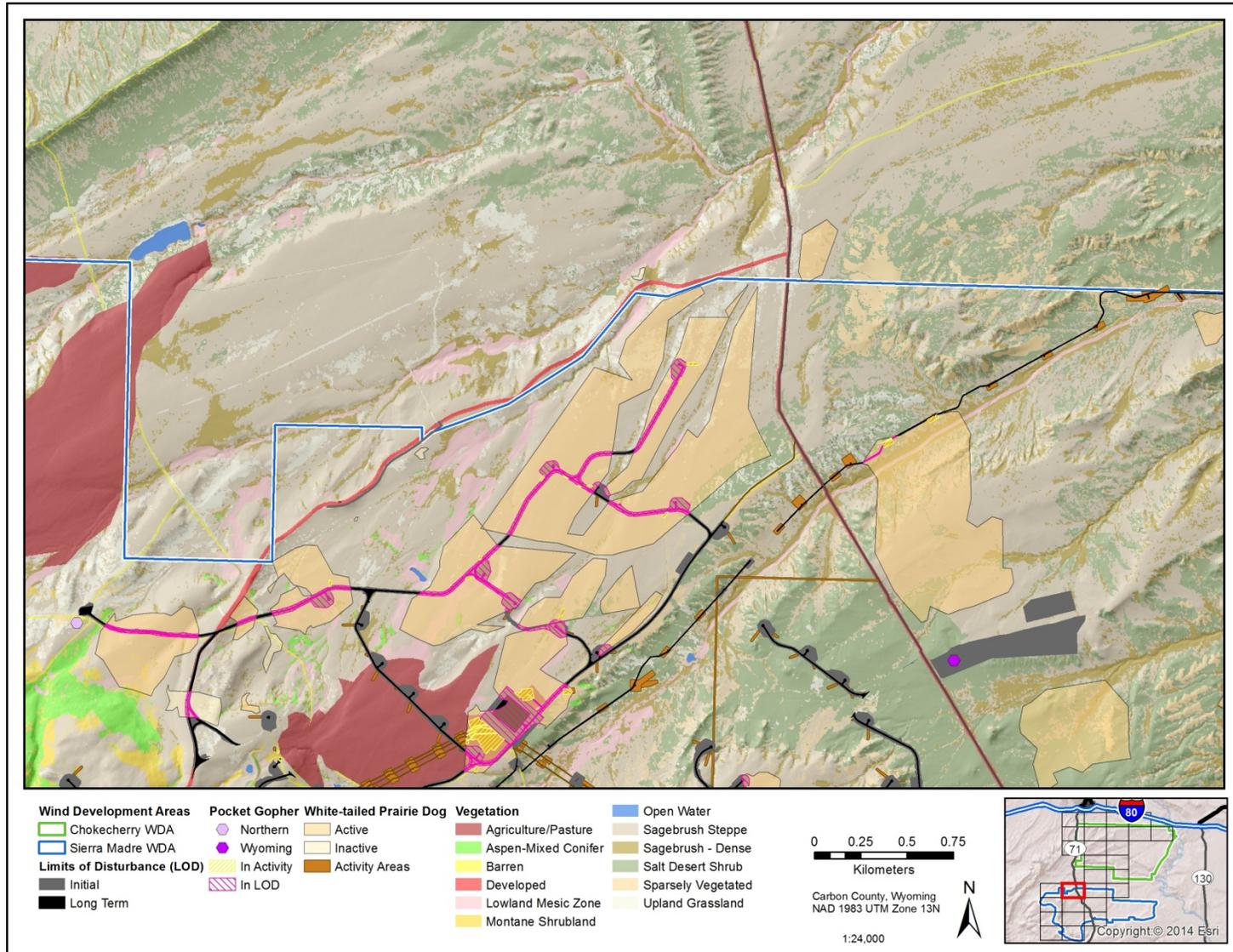


Figure A.15 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

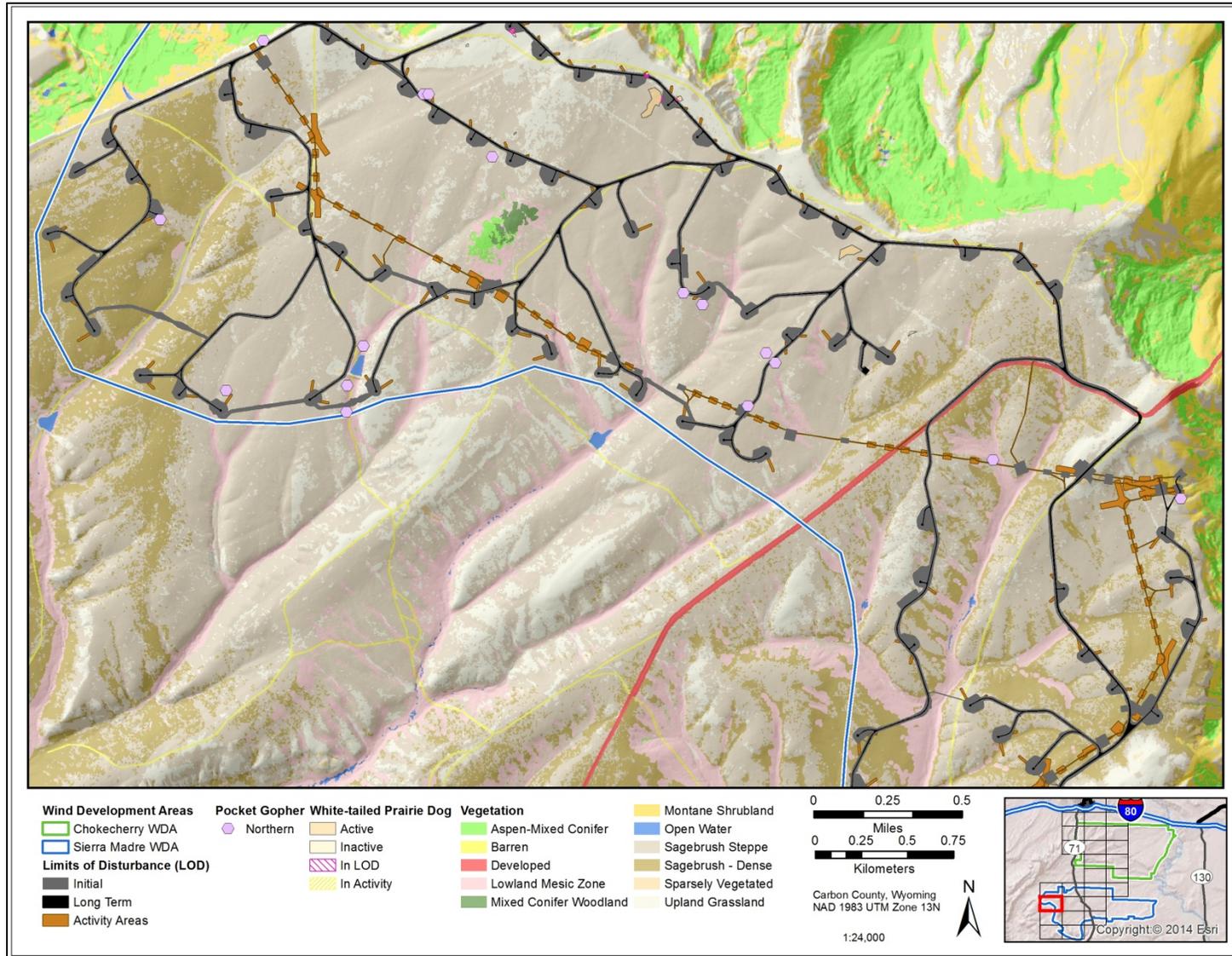


Figure A.16 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

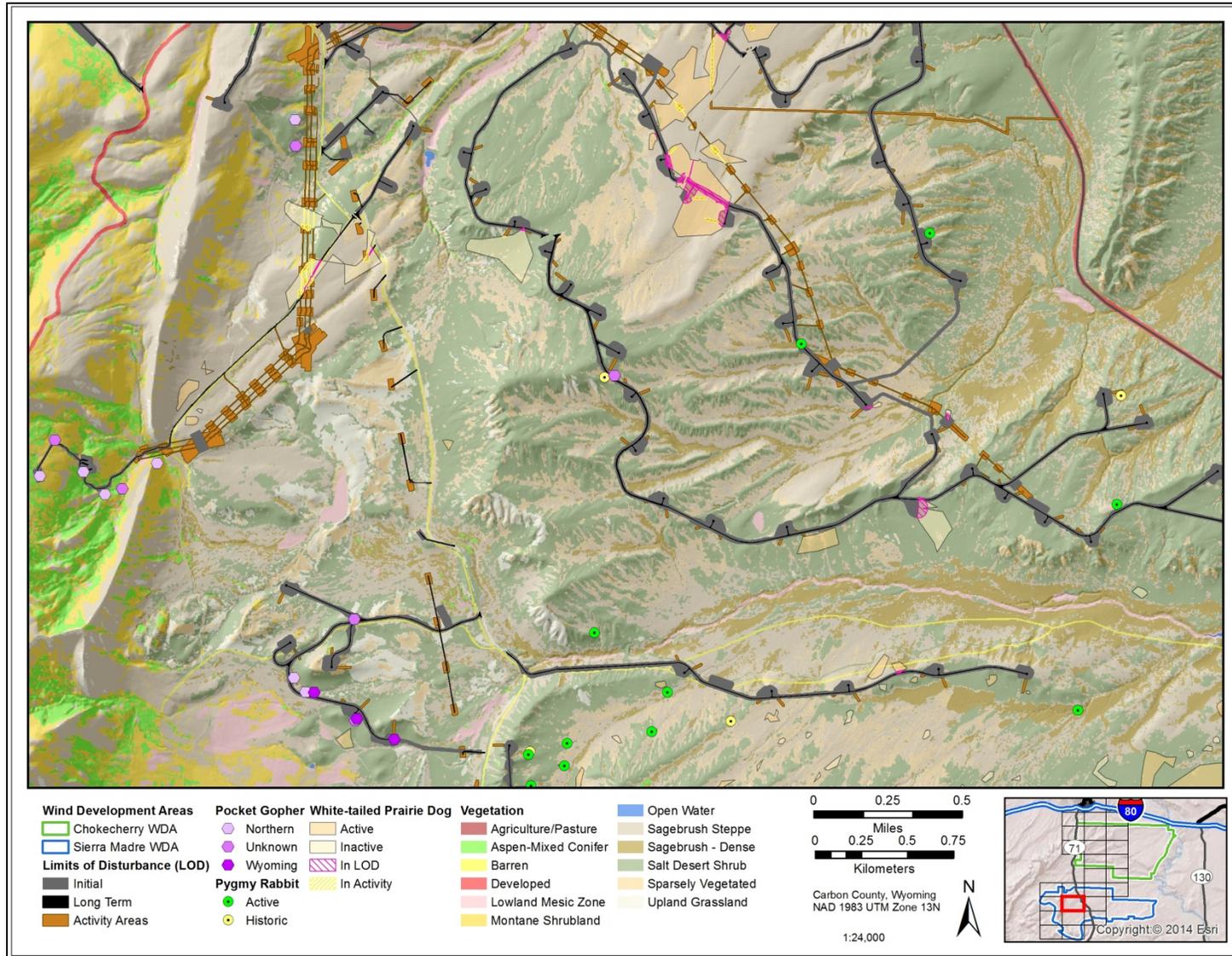


Figure A.17 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

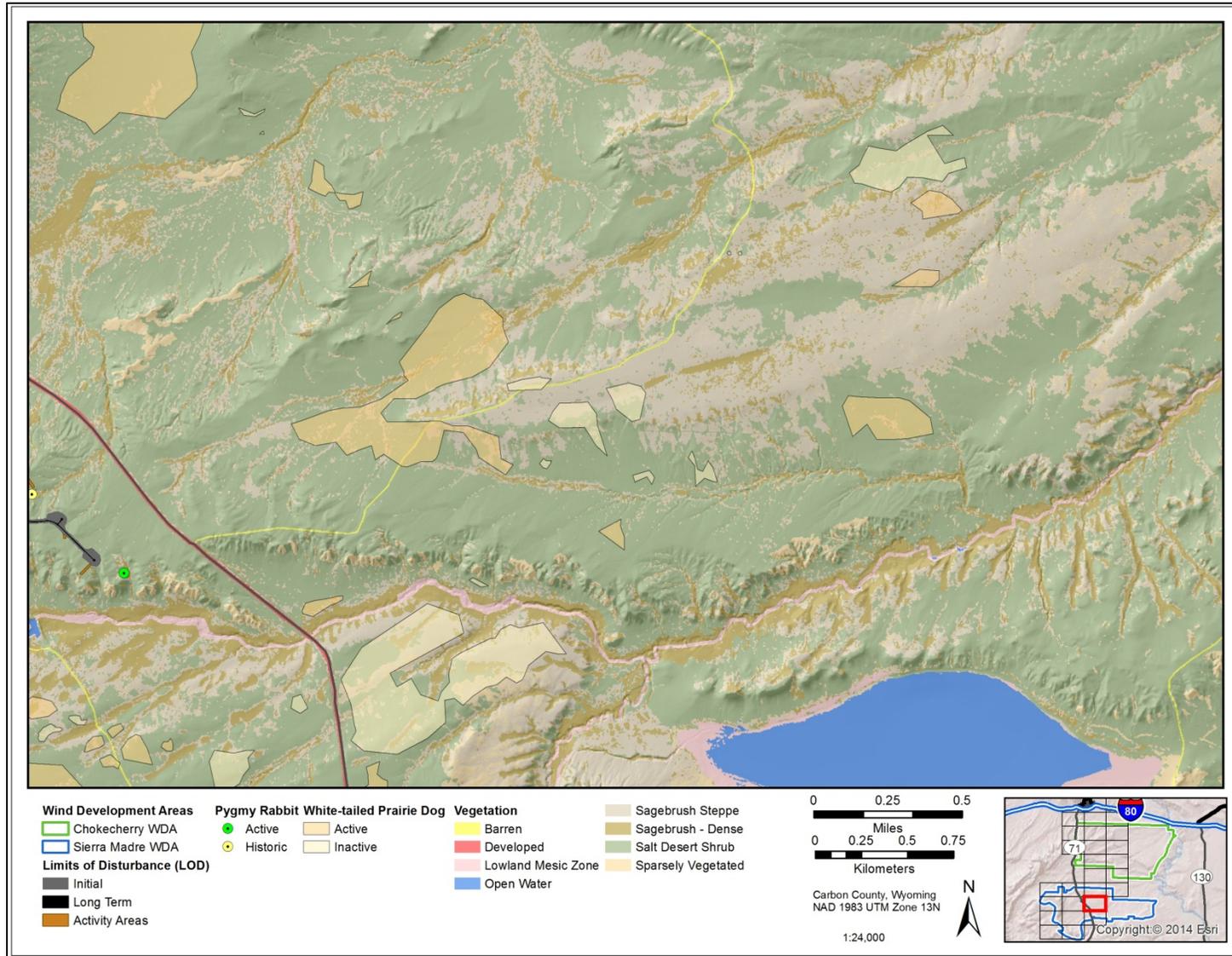


Figure A.18 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

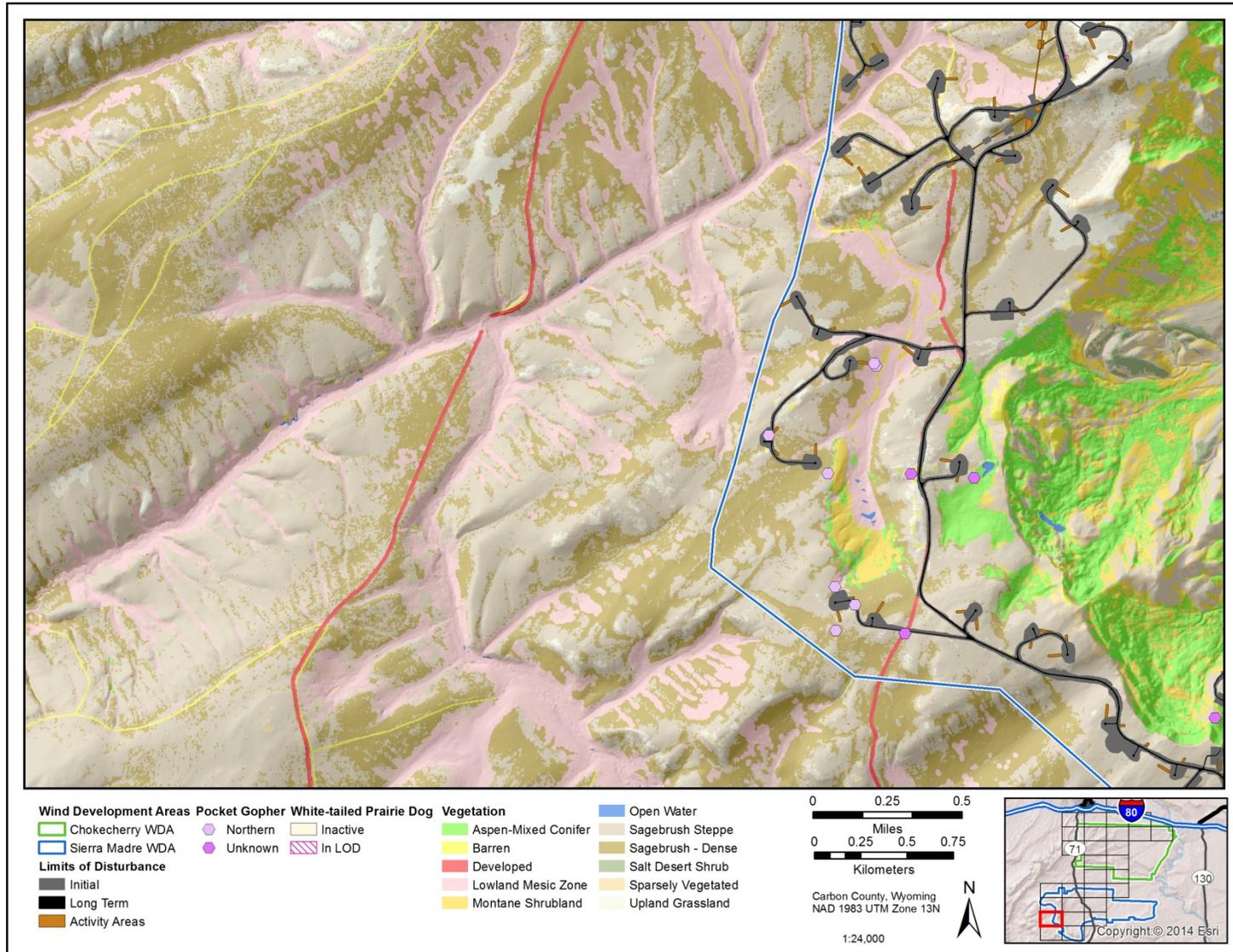


Figure A.19 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

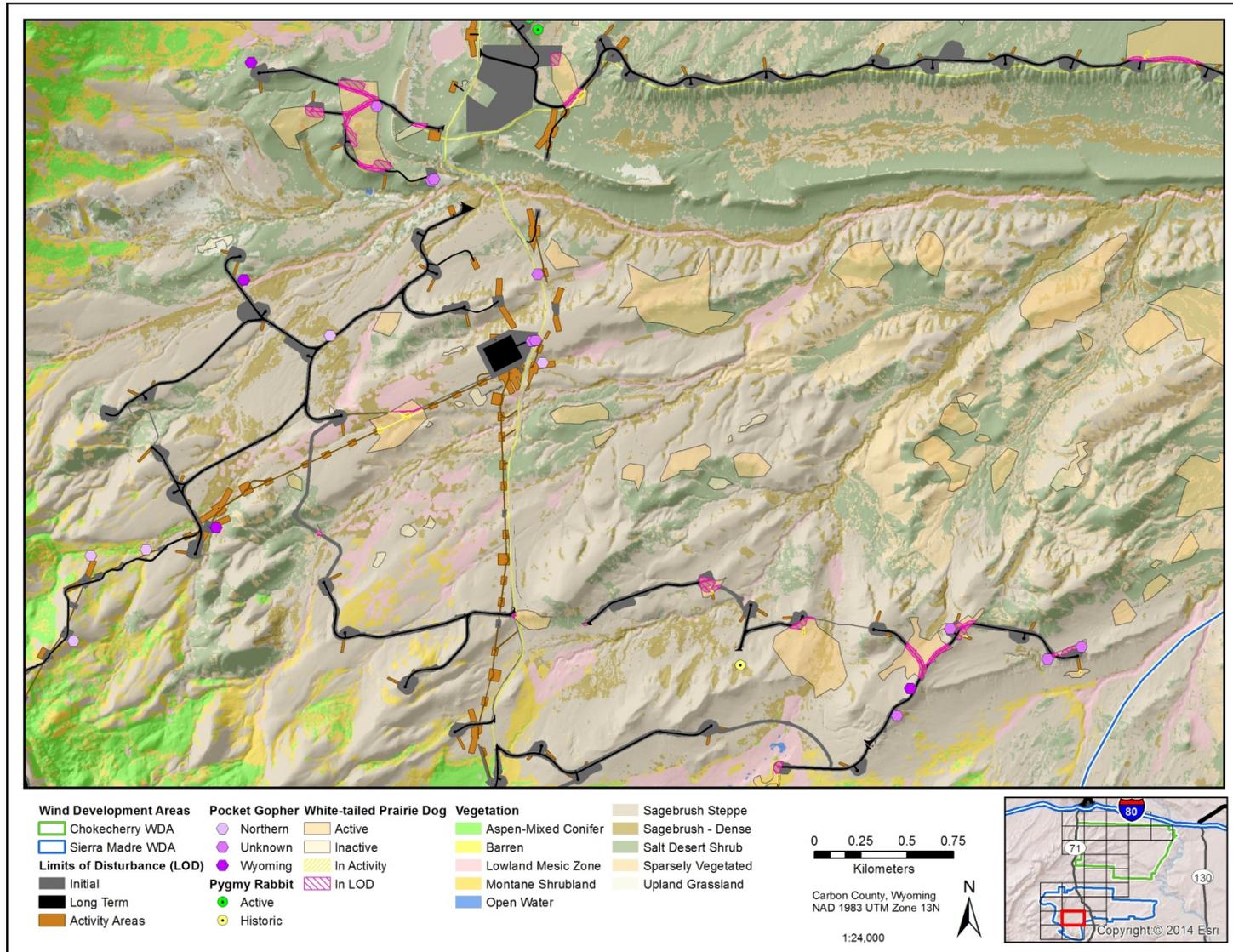


Figure A.20 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

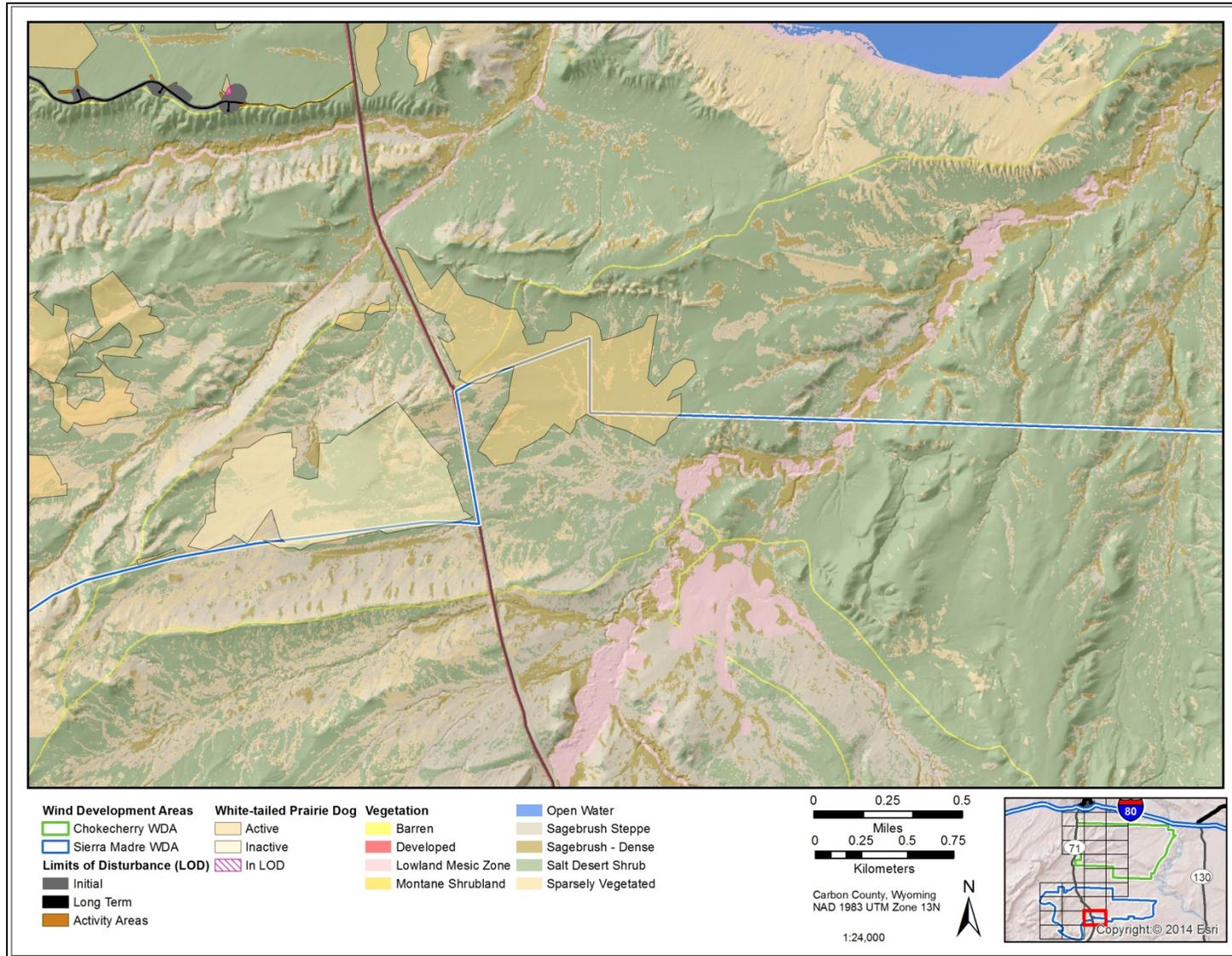


Figure A.21 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

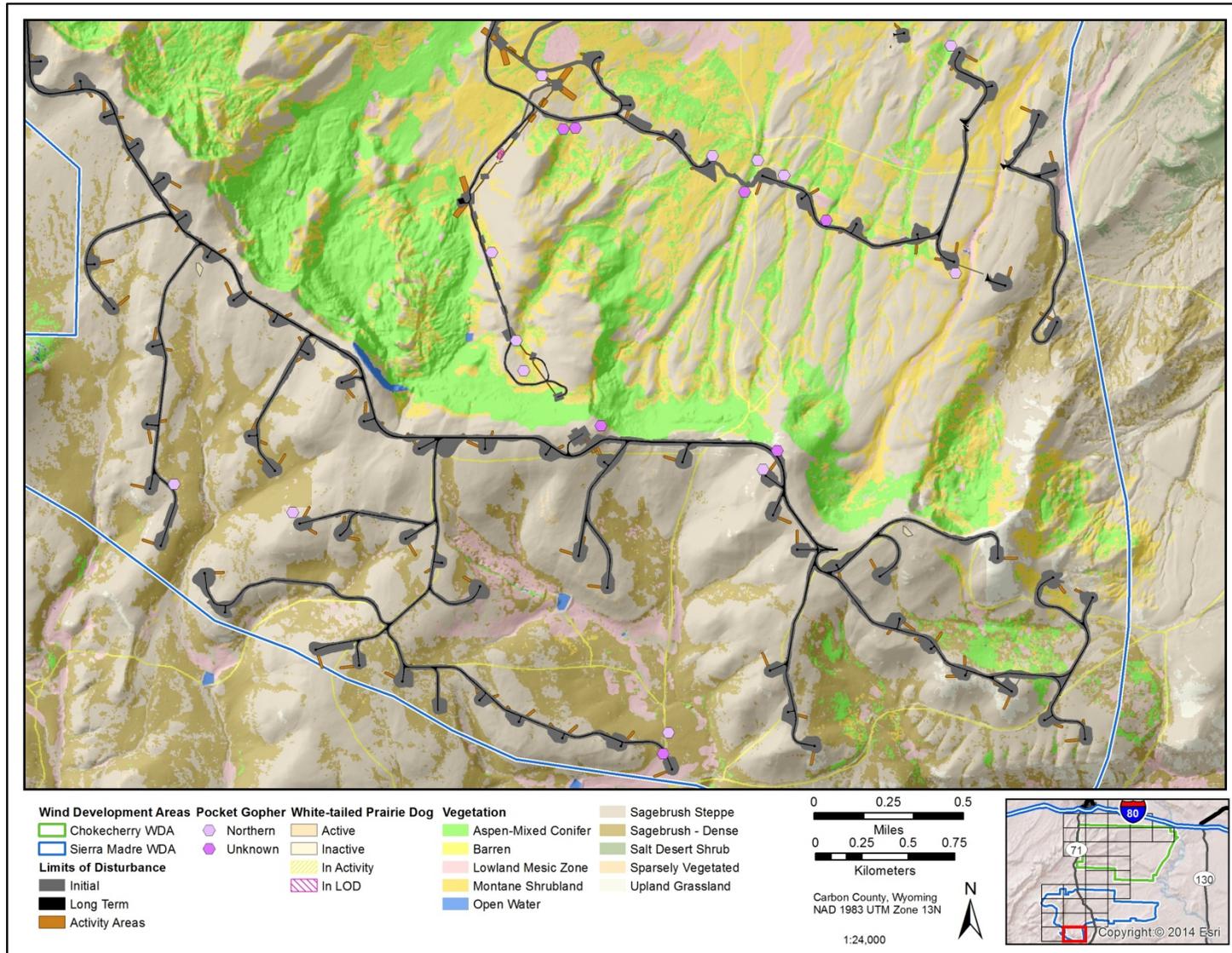


Figure A.22 Special Status Small Mammal Occurrences within the Phase I Wind Turbine Development Site.

ATTACHMENT B
Pocket Gopher Occupancy Model

Griscom and Keinath (2010) have developed a diagnostic tool to determine pocket gopher species occupancy using easily measurable field variables. This model predicts if mounds are more likely occupied by Wyoming pocket gopher or the more common northern pocket gopher. Input variables for the model were based on a number of significant differences between mound characteristics and cover variables (e.g., burrow diameter, percent bare ground, percent sagebrush cover, etc.) recorded at Wyoming pocket gopher trapping locations, northern pocket gopher trapping locations, and unoccupied control sites (Griscom et al. 2010).

Burrow diameters of predicted Wyoming pocket gopher mounds were approximately 42 mm (± 0.6 95% C.I.), while larger burrow diameters occurred in predicted northern pocket mounds (52 mm ± 0.6 95% C.I.). Generally, smaller tunnels are more characteristic of the smaller Wyoming pocket gopher, and larger tunnels are more likely occupied by northern pocket gopher (Griscom et al. 2010). Although average burrow diameters for both species were less than 55 mm, predicted northern pocket gopher mounds had significantly larger burrows compared to predicted Wyoming pocket gopher mounds (Table B-1).

Table B-1. Habitat characteristics of occupied pocket gopher habitat.

Predicted Species	Burrow Diameter (mm)		Sagebrush Cover (%)		Bare Ground (%)	
	Average	95% C.I.	Average	95% C.I.	Average	95% C.I.
Wyoming pocket gopher	42	0.6	6.6	0.64	84.3	1.02
Northern pocket gopher	52	0.6	33.8	8.82	24	6.05

Habitat characteristics (percent sagebrush cover and percent bare ground) differed between pocket gopher species as well (Figure B-1). Percent sagebrush cover surrounding predicted Wyoming pocket gopher mounds was approximately 6.6% (± 0.6 95% C.I) compared to 33.8% ($\pm 8.82\%$ 95% C.I.) surrounding predicted northern pocket gopher mounds. Low-statured shrubs (predominantly Gardner’s saltbush) and forbs are characteristic of Wyoming pocket gopher habitat, while sagebrush abundance is often limited (Keinath and Griscom 2009).

Modeled results (Table B-1) are consistent with those of previous efforts in southern Wyoming (Keinath and Griscom 2009, Griscom et al. 2010). Predicted Wyoming pocket gopher locations were not in areas of moderate to high dominance of big sagebrush, sand dunes, or in low-lying areas such as valley bottoms and flats dominated by greasewood and or big sagebrush. Conversely, northern pocket gophers were located in areas of dominant big sagebrush cover, more grass cover, more litter cover, and steeper slopes.

Percent bare ground was also different between pocket gopher species (Figure B-1). In areas surrounding predicted Wyoming pocket gopher mounds percent bare ground was approximately 84.3percent (± 1.02 95% C.I.) and was not as ubiquitous in areas surrounding predicted northern pocket gopher mounds (24% ± 6.05 95% C.I.). Griscom and others (2010) found that Wyoming pocket gophers occur on sites with 50% to 80% bare ground and little to no grass or litter cover, where Gardner’s saltbush (dominant) and winterfat are present and big sagebrush is either absent of subdominant.

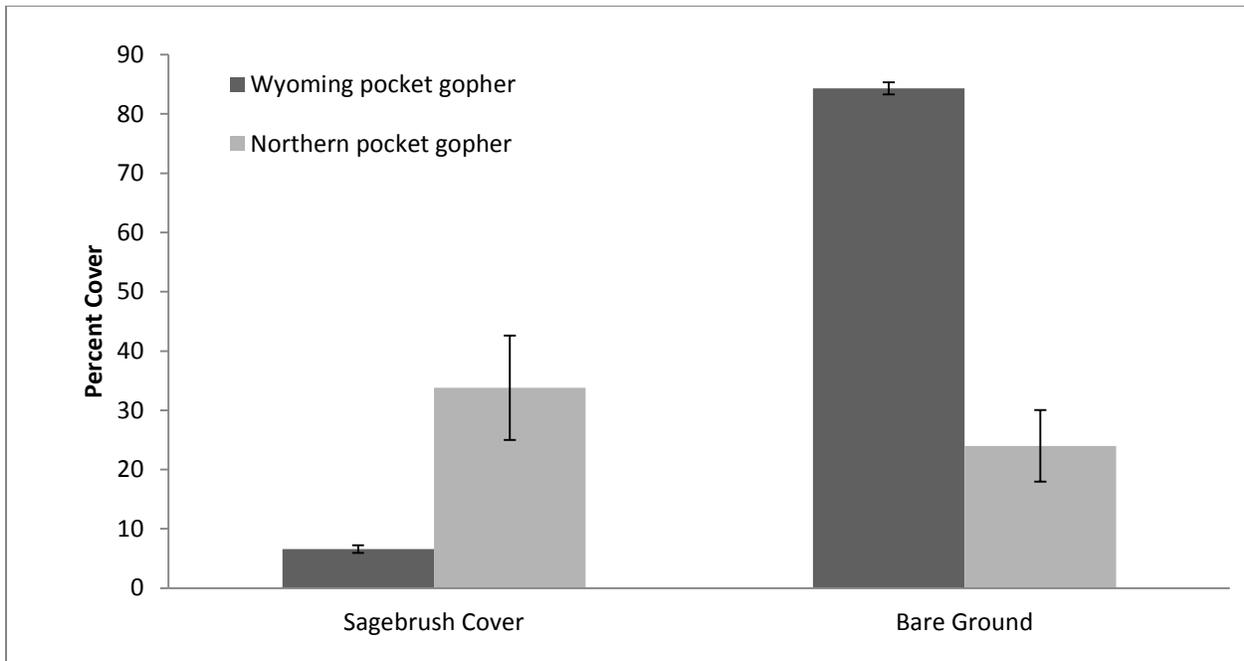


Figure B-1. Estimated sagebrush cover and percent bare ground for predicted pocket gopher habitat. Error bars = 95% confidence intervals.