APPENDIX F: Terrestrial Wildlife Resources Evaluation

TERRESTRIAL WILDLIFE RESOURCES EVALUATION,

BLACK BUTTE COPPER PROJECT,

MEAGHER COUNTY, MONTANA

Prepared for:

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August 2015

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1.0 INTRODUCTION

1.1 PURPOSE AND TIME FRAME

In August 2014 Tintina Resources, Inc. (Tintina) contracted WESTECH Environmental Services, Inc. (WESTECH) to characterize terrestrial wildlife resources at Tintina's proposed copper mine, called the Black Butte Copper Project. Field work was conducted irregularly from late August 2014 through early August 2015, with most effort expended in April-July 2015.

82-4-301(2) MCA recognizes that metal mining could potentially affect biological resources, and that reclamation specifications must vary accordingly.

ARM 17.24.116(3)(a) requires that an operating permit application must include "a description of the existing environment."

ARM 17.24.116(3)(u) states that an operating permit application must include "the protective measures designed to avoid foreseeable situations of unnecessary damage to flora and fauna in or adjacent to the area."

The Montana Environmental Policy Act (MEPA; 75-1 MCA) provides for an environmental review of a proposed project, including biological resources.

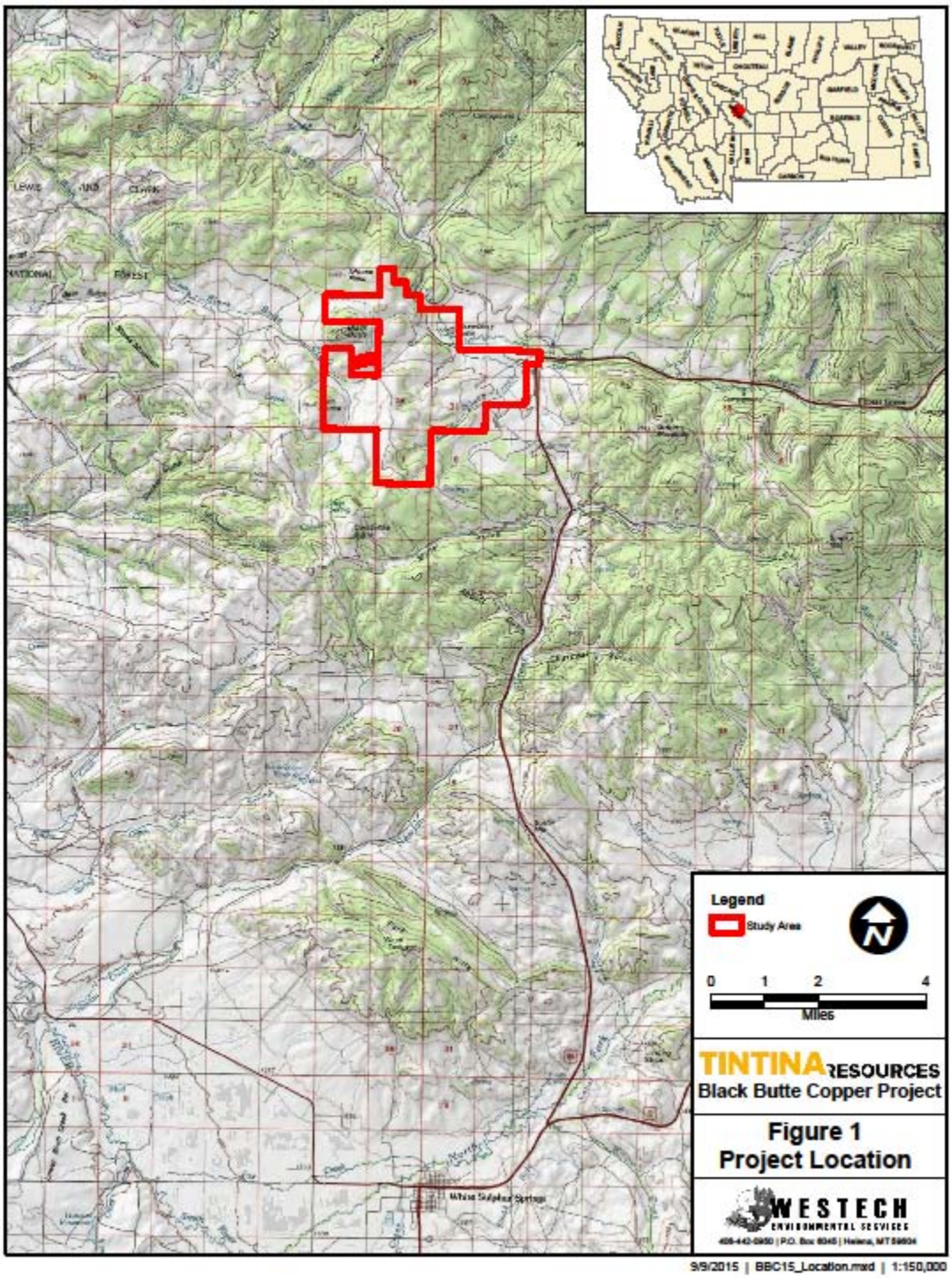
Consequently the objectives of the Black Butte Copper Project terrestrial wildlife resources evaluation were:

- Develop a list of terrestrial wildlife species potentially or actually present on or adjacent to the proposed permit area;
- Map and describe existing habitats potentially affected by mining and reclamation;
- Describe wildlife-habitat relationships;
- Provide information from which, to the extent possible, determinations of impacts to terrestrial wildlife resources due to proposed mining and reclamation can be made; and
- Provide a basis for developing an effective reclamation plan.

1.2 DESCRIPTION OF THE STUDY AREA

The study area (Figure 1) is approximately 15 miles north of White Sulphur Springs, in Meagher County, Montana. It is located in all or portions of Section 1, T11N R6E; Sections 23-26, 35 and 36, T12N R6E; and Sections 19 and 29-32, T12N R7E, comprising about 5290 acres.

Both climate (long-term weather patterns) and short-term weather can dramatically affect wildlife (e.g., Frisina and Frisina 2008). The study area climate is continental, with cold winters, warm summers, and a comparatively short (April-September) growing season. Average temperatures during the 2010-2014 period at White Sulphur Springs, which is about 400 feet lower in elevation than the study area, ranged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Study Area
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TINTINA RESOURCES
Black Butte Copper Project
Figure 1
Project Location
WESTECH
ENVIRONMENTAL SERVICES
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from a minimum of about 15°F in December-January to a maximum of about 80°F in July-August (NOAA 2015). Seasonal extreme temperatures were considerably colder (-36°F) or warmer (+95°F). Average precipitation was about 10-11 inches, with most falling as rain in May and June (NOAA 2015).

Elevations in the study area are comparatively high, ranging from about 1650 m (5400 feet) in the east to about 1900 m (6200 feet) in the south, and averaging about 1750 m (5700 feet). Consequently, study area winter temperatures are probably colder than in White Sulphur Springs, while summer temperatures are generally cooler. Similarly, precipitation amounts in the study area are probably higher than in White Sulphur springs, particularly reflected in snow depths during winter.

Study area topography varies from comparatively level in the Sheep Creek stream bottom, to gently to steeply rolling. There are tame pasture/hay fields along the Sheep Creek stream bottom, narrow stringers of riparian and mesic shrub habitats in drainage bottoms, and a mosaic of grassland and sagebrush habitats interspersed with coniferous forest in the rolling uplands.

Sheep Creek, a tributary of the Smith River, flows through the northeast corner of the study area. Little Sheep Creek, a tributary of Sheep Creek, drains the east portion of the study area, while Big Butte Creek, also a tributary of Sheep Creek, drains the west portion of the study area.

The primary access routes in the study area are Highway 89 (paved), Sheep Creek Road (all season gravel), and Big Butte Road (gravel). All access into the study area uplands was by two-track trails that were impassable when wet or under deep snow.

The principal land use in the study area is cattle ranching. There were no permanent residences in the study area.

1.3 ACKNOWLEDGEMENTS

The Black Butte Copper Project terrestrial wildlife resources evaluation was funded entirely by Tintina Resources, Inc. Tintina's Bob Jacko administered WESTECH's contract. Jerry Zieg (Vice President, Exploration), Vince Scartozzi (Senior Geologist) and Chance Matthews (Senior Field Technician) shared their knowledge of wildlife use of the study area.

Allan Kirk of Geomin Resources, Inc. reviewed WESTECH's study plan, supervised WESTECH's involvement in the project, and provided considerable information and support throughout the evaluation.

Kristina Smucker, Jay Kolbe and Ethan Lula of Montana Fish, Wildlife and Parks (FWP) generously shared their information and knowledge of wildlife resources in the study area vicinity.

Rancher Spike Short shared his insights on wildlife use of the area.

The Montana Natural Heritage Program (MTNHP) provided occurrence records of Species of Concern from the vicinity.

WESTECH's primary field investigator was Patrick Farmer; Ken Scow, Jessica Allewalt, John Beaver, Drake Barton, Dean Culwell and Corey Baker recorded several wildlife sightings while they conducted other studies. This report was written by Patrick Farmer; Dan Culwell prepared the wildlife habitat map and all figures for the report.

2.0 METHODS

2.1 HABITAT DELINEATION AND MAPPING

Wildlife habitats in the Black Butte Copper Project terrestrial wildlife resources study area are a function of geology, climate, topography, soils, vegetation and land use. A wildlife habitat map was prepared using WESTECH's (1993) system, which was derived from Coenenberg *et al.* (1977) and is based on dominant existing vegetation and physical features such as rock outcrops and ponds. In order to ensure consistency with the vegetation baseline study, vegetative wildlife habitat subtype map unit boundaries were derived from the vegetation community map (Scow 2015) and were mapped at a scale of 1" = 1000'.

2.2 SPECIES LIST

A list of terrestrial wildlife species potentially occurring in the Black Butte Copper Project study area was derived from general literature sources (MTNHP 2015a). This list was further refined by legal status (listed, proposed or candidate species under the Endangered Species Act of 1973; USFWS 2015), occurrence status (resident vs. migrant), and whether or not preferred/primary habitats were available in the study area. During field work all species documented by sightings or evidence were recorded by the habitat in which they were observed. These records were compared to habitat availability to describe habitat use by species, and species richness by habitat.

2.3 BIG GAME

For the purposes of this study, big game animals were considered to be those species defined as "game animals" by FWP (87-2-101(4) MCA) or "nongame in need of management" (ARM 12.2.501) that could potentially occur in the study area: pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), moose (*Alces americanus*), mountain lion (*Puma concolor*), black bear (*Ursus americanus*) and gray wolf (*Canis lupus*). Big game sightings were recorded throughout the study by species, date, time of day, habitat, number of animals, age and gender (if possible) and activity, and GPS locations were mapped on an aerial photographic base on an IPad.

FWP has developed the Crucial Areas Planning System (CAPS), a GIS-based analysis of the relative importance for wildlife of each square mile. CAPS mapping has identified the study area as mule deer winter range. In terms of overall terrestrial game quality, the study area is assigned a rank of Class 3 (where a rank of 1 is highest and a rank of 4 is lowest) for winter range quality.

2.4 UPLAND GAME

For the purposes of this study, upland game animals were considered to be those species defined as "upland game birds" by FWP (87-2-101(13) MCA) that could also occur in the study area vicinity: gray partridge (*Perdix perdix*), ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), greater sage-grouse (*Controcercus urophasianus*), dusky grouse (*Dendragapus obscurus*), sharp-tailed grouse (*Tympanuchus phasianellus*) and wild turkey (*Meleagris gallopavo*).

Throughout field work, observations of upland game birds were recorded by species, date, time of day, habitat, number of animals, age and gender (if possible), and activity, and were mapped on an aerial photographic base via an IPad. In April and May an effort was made to hear displaying male birds from vantage points in appropriate habitat throughout the study area.

2.5 RAPTORS

For the purposes of this study, raptors (defined by FWP in 87-2-202 MCA) were considered to be members of the Accipitriformes (vultures, eagles and hawks), Falconiformes (falcons) and Strigiformes (owls). Throughout the study, raptor sightings were recorded by species, date, time of day, habitat, number of animals, age and gender (if possible), and activity, and were mapped on an aerial photographic base via an IPad.

Surveys for breeding owls were conducted at night in late April, mid-May and mid-June. After several minutes of listening, recorded calls of species most likely to occur in the area in spring (northern saw-whet owl (*Aegolius acadicus*), long-eared owl (*Asio otus*), great gray owl (*Strix nebulosi*) and great horned owl (*Bubo viginianus*) were played in ascending order of bird size, to solicit responses.

Searches for nests of owls and diurnal raptors in the study area were conducted in May, June and July by: 1) driving accessible roads and trails in the area, stopping at vantage points to look for nests and listen for calling adults; and 2) walking through appropriate habitats and looking for nests (stick nests, ground nests, tree cavities and rock ledges/cavities) or breeding/territorial behavior of adult birds. Nests were photographed, mapped and recorded in field notes.

2.6 WATERFOWL AND SHOREBIRDS

For the purposes of this study, waterfowl were defined as members of the order Anseriformes (geese, ducks and swans) while shorebirds were members of the orders Gaviiformes (loons), Podicipediformes (grebes), Pelecaniformes (pelicans and cormorants), Ciconiiformes (herons, bitterns, ibises, *etc.*), Gruiformes (cranes, rails, coots, *etc.*) and Charadriiformes (plovers, snipe, sandpipers, avocets, phalaropes, gulls, terns, *etc.*). Of these, FWP (87-2-101(3) MCA) defines "migratory game birds" to be wild ducks, wild geese, swans, cranes, rails, coots, and Wilson's snipe; the mourning dove (considered a landbird in this report) is also included under this statute. Aquatic habitats in the study area are essentially limited to the Sheep Creek and Little Sheep Creek bottoms; developed springs in the study

area do not provide appropriate habitat for most waterfowl and shorebirds. Aquatic habitats in the two creek bottoms were examined in spring and summer for use by waterfowl and shorebirds. Shorebirds that might occur in upland habitats (*e.g.*, killdeer (*Charadrius vociferus*) were inventoried via opportunistic observations.

2.7 LANDBIRDS

For the purposes of this study, landbirds were defined as all species except upland game, raptors, waterfowl and shorebirds. Most landbirds are considered "nongame" by FWP (87-2-101(8) MCA). Throughout the study, all landbirds were recorded by the habitat in which they were observed.

The University of Montana's Avian Science Center (ASC) conducted long-term landbird monitoring throughout western Montana, using standardized timed plot counts. One plot was located on U.S. Forest Service (USFS) administered land near the west edge of the Black Butte Copper Project study area. Counts were run in 1994-1996, 1998, 2000, 2002 and 2004. Data were provided to MTNHP, and were incorporated into the species list for the Black Butte Copper Project terrestrial wildlife evaluation.

2.8 MEDIUM-SIZED MAMMALS

For the purposes of this study, medium-sized mammals were defined to be animals from the size of a Richardson's ground squirrel (*Urocitellus richardsonii*) to the size of a coyote (*Canis latrans*), and included some species that have legal status as "fur-bearing mammals" (beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), Canada lynx (*Lynx canadensis*), bobcat (*Lynx rufus*), wolverine (*Gulo gulo*), northern river otter (*Lontra canadensis*), marten (*Martes americana*) and American mink (*Mustela vison*); 87-2-101(3) MCA) or "predatory mammals" (coyote, weasels (*Mustela* spp.) and striped skunk (*Mephitis mephitis*); 87-2-101(11) MCA). All other medium-sized mammals are considered "nongame" by FWP (87-2-101(8) MCA).

All medium-sized mammals observed by direct sightings or evidence during all aspects of the baseline inventory were recorded by the habitat in which they were observed. Sightings of medium-sized mammals that have legal status were recorded by species, date, time of day, habitat, number of animals, age and gender (if possible) and activity, and were mapped on an aerial photographic base via an IPad.

2.9 SMALL MAMMALS (EXCLUDING BATS)

For the purposes of this study, small mammals were defined as mammals up to the size of a ground squirrel. All small mammals are considered "nongame" by FWP (87-2-101(8) MCA). No effort was made to quantitatively sample small mammals. Throughout the study, small mammals or their evidence (*e.g.*, tracks, skulls in raptor casts, burrows) were recorded by the habitat in which they were observed.

2.10 BATS

Fifteen species of bats possibly occur in Montana; of these, 10-11 potentially occur in the vicinity of the Black Butte Copper Project study area (MTNHP 2015a; Foresman 2012). No attempt was made to inventory bat species richness via acoustic surveys; given the parameters of the study, it was not possible to establish seasonal or long-term acoustic monitoring of the study area, which would have been necessary to document bat use. Nevertheless, when unidentified bats were observed, they were recorded by the habitat in which they were seen.

2.11 AMPHIBIANS AND REPTILES

All amphibians and reptiles were recorded by the habitat in which they were seen. In addition, opportunistic searches were conducted at water sources for amphibians (listening for displaying adults, looking for adults, egg masses or larvae) and at rock outcrops for reptiles (looking for basking adults, turning over rocks).

2.12 ENDANGERED OR THREATENED SPECIES

The USFWS (2015) identified three terrestrial wildlife species that are listed, proposed or candidates for listing under the Endangered Species Act of 1973, as amended (ESA) for Meagher county: Canada lynx (listed threatened), greater sage-grouse (candidate) and Sprague's pipit (*Anthus spragueii*; candidate).

The dominant vegetation that constitutes lynx habitat in the Northern Rocky Mountains is subalpine fir (*Abies lasiocarpa*), Engelmann spruce (*Picea engelmannii*) and lodgepole pine (*Pinus contorta*); dry forest types (*e.g.*, ponderosa pine (*Pinus ponderosa*) and dry Douglas-fir (*Pseudotsuga menziesii*)) do not provide lynx habitat (USFWS 2014). Consequently, preferred habitat for the Canada lynx is not available in the Black Butte Copper Project study area vicinity, and the probability of a sighting in the study area is considered to be very low.

The USFWS (2014) delineated Designated Critical Habitat for the Canada lynx in Montana. Meagher County is not included within Designated Critical Habitat under this delineation.

The greater sage-grouse (sage-grouse) is considered to be a sagebrush dependent species (e.g., Connelly et al. 2011). There are known sage-grouse leks (display sites) 10-13 miles from the Black Butte Copper Project study area, but there are no occurrence records within 10 miles (MTNHP 2015b).

Sprague's pipits prefer flat-to-gently rolling native mixed-grass prairie with intermediate height grasses (4-10 inches), little bare ground or club moss, no or few shrubs and no trees. They do not nest in patches of habitat less than 70 acres, and prefer patches greater than 350 acres in size. They strongly select for native rather than introduced grasses. Depending on the site, they may avoid roads and trails, pipeline corridors and vertical structures such as towers and transmission poles (Jones 2010). Based on

this description, none of the Black Butte Copper Project terrestrial wildlife resources evaluation area was considered to be preferred Sprague's pipit habitat.

2.13 SPECIES OF CONCERN

Montana has established a list of vertebrate animal Species of Concern (MTNHP and MFWP 2015); these species are included in Appendix A. All such species observed during the study were recorded by the habitat in which they were observed and, if appropriate, their locations were mapped.

3.0 RESULTS AND DISCUSSION

3.1 HABITAT AVAILABILITY

Hall *et al.* (1997) defined "habitat" as "…the resources and conditions present in an area that produce occupancy – including survival and reproduction – by a given organism." This definition is useful when applied to a single species or a small species group (*i.e.*, "a given organism"). However, terrestrial wildlife resource inventories usually must also address a broad range of species groups (*i.e.*, amphibians, reptiles, mammals and birds), some of which may be migrants (*i.e.*, "reproduction" may not be a consideration), that are present in a comparatively small geographic area (the study area) (States *et al.* 1978). For the purposes of this study, wildlife habitat is considered to be the combination of biotic (*e.g.*, vegetation, other animal species) and abiotic (*e.g.*, topography, climate) conditions preferred or used (temporarily, seasonally or year round) by a particular terrestrial wildlife species or species group.

Wildlife habitat components can be broadly defined as food, water, cover and space. The type, quantity and distribution of these components determine the kinds of wildlife present in a given area; thus habitat components can be used to determine the species potentially occurring in the area. Some of these factors (Morrison *et al.* 2006) that are relevant to the Black Butte Copper Project study area include:

- Geology and soils: Geology (affected by factors such as wind and water erosion) creates topography and soils that help determine the use of an area by wildlife. Soils create conditions to support vegetation communities, as well as microsite habitat conditions that determine use by some wildlife species.

- Vegetation: Vegetation communities provide forage, thermal cover, nesting substrate, *etc.*;

- Vertical and horizontal structure: Habitat vertical structure in the Black Butte Copper Project study area encompasses abiotic conditions such as rock outcrops, and biotic conditions such as tree species (coniferous vs. deciduous), and presence and density of shrubs in the understory. Horizontal structure provides cover and forage (*e.g.*, dense sagebrush vs. open sagebrush; bunchgrass habitat with considerable bare ground vs. sod-forming grass with less bare ground);

- Size, arrangement and interspersion of habitats: some wildlife species prefer comparatively large areas of a single habitat, while others prefer edges and ecotones between habitat types;

- Surrounding landscape: viewed from satellite imagery, the Black Butte Copper Project study area (about 5700 feet in elevation) is in a transitional zone between the rugged, forested Little Belt Mountains (maximum elevation about 9000 feet) and the rolling, xeric hills adjoining the Smith River (about 4400 feet in elevation at the confluence with Sheep Creek). Thus there is considerable habitat diversity in or near (within 10 miles of) the study area, which could potentially contribute to terrestrial wildlife species richness of the study area. However, the study area elevations may be too high for some species that occur at lower elevations;

- Time of year: some of the bird species that might be encountered in the Black Butte Copper Project study area are spring and autumn migrants through the area, rather than breeding residents. Big game distribution may change seasonally, depending on habitat availability and weather severity; and

- Habitat features: small areas or microsite habitats created by impoundments, rock outcrops, snags, *etc.*, may allow certain wildlife species to use an area where they would otherwise be less likely to occur.

For the purposes of this study, habitat delineation was based on dominant existing vegetation and physical features. Six major wildlife habitat types, comprising 12 habitat subtypes, were identified in the Black Butte Copper Project terrestrial wildlife resources study area (Plate 1). Habitat types and subtypes are described in Appendix B. Acreages of habitat subtypes are presented in Table 1. Terrestrial wildlife species recorded by habitat are given in Appendix C. Habitat availability is compared to species richness in Figure 2.

Habitat Type 000 (Miscellaneous Features) comprised only about one percent of the study area (Table1), but wildlife species richness for these habitat subtypes was comparatively high (Figure 2). Subtype 002 (pond/impoundment/stream) was particularly important for certain species/species groups (Appendices B and C).

Habitat Type 100 (Woodland) comprised five habitat subtypes (Appendix B). Aspen (subtype 105) and aspen/Douglas-fir (subtype 105/160) were mapped for <1 percent and <2 percent of the study area, respectively, but almost 16 percent of the species recorded during the study were observed in these habitats. Similarly, willow (subtype 114) comprised <2 percent of the study area but almost 20 percent of all species were recorded at least once in this habitat. Douglas-fir (subtype 160) and Douglas-fir/sagebrush (subtype 160/212) totaled about 30 percent of the study area, but almost 45 percent of the wildlife species observed during the study were recorded at least once in this habitat (Figure 2). Vertical and horizontal structure (discussed above) in woodland habitats created structural complexity that resulted in larger numbers of species per habitat area.

Table 1. Habitat types and subtypes, Black Butte Copper Project terrestrial wildlife study area, 2015.

Map Unit	Habitat		Amount	
	Type	Subtype	Approx. Acres	Percent
	000. Miscellaneous Features			
001		Rock Outcrop	4	0.1
002		Water	5	0.1
020		Road	28	0.5
021		Buildings	10	0.2
		Sub-total	**47**	**0.9**
	100. Woodland			
105		Aspen	29	0.5
105/160		Aspen/Douglas-fir	88	1.7
114		Willow	97	1.8
160		Douglas-fir	929	17.6
160/212		Douglas-fir/sagebrush	662	12.5
		Sub-total	**1805**	**34.1**
	200. Xeric Shrub			
212		Sagebrush	822	15.5
212/411		Sagebrush/bunchgrass mosaic	1669	31.6
		Sub-total	**2491**	**47.1**
	300. Mesophytic Shrub			
320		Low Mesic shrub	83	1.6
		Sub-total	**83**	**1.6**
	400. Grassland			
411		Bunchgrass	661	12.5
413		Riparian Grass	165	3.1
		Sub-total	**826**	**15.6**
	500. Agriculture			
510/530		Hay/Tame Pasture	38	0.7
		Sub-total	**38**	**0.7**
		TOTAL	**5290**	**100.0**

Habitat Type 200 (Xeric Shrub) was represented by two subtypes, sagebrush (subtype 212) and a sagebrush/bunchgrass mosaic (subtype 212/411), and totaled about 34 percent of the study area (Table 1). About 36 percent of all wildlife species observed during the study were recorded at least once in this habitat (Figure 2).

Habitat Type 300 (Mesophytic Shrub) was a comparatively minor component of the study area, totaling <2 percent of the area (Table 1). It contributed a comparably small number (Appendix C) and percentage (Figure 2) of wildlife species.

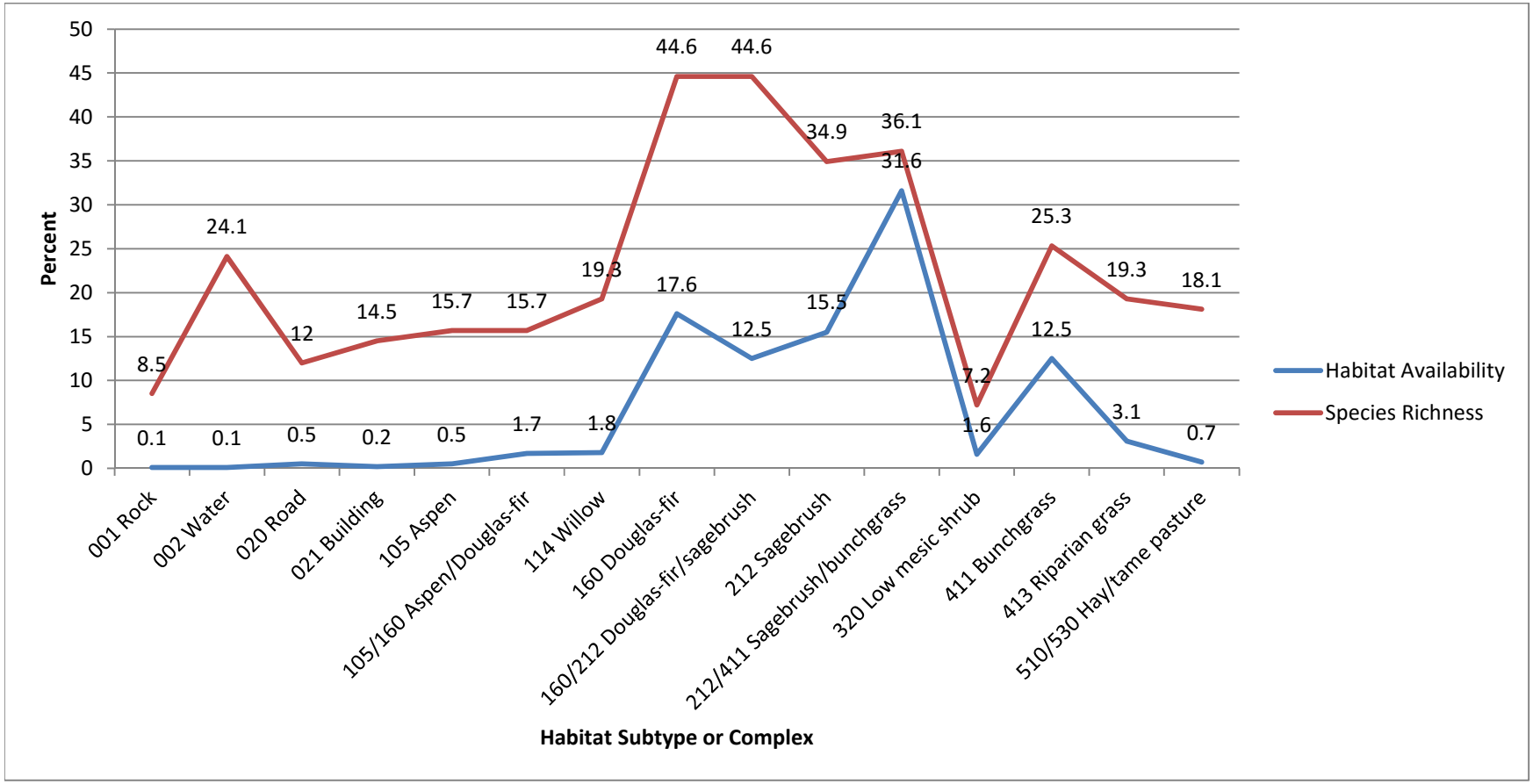


Fig. 2. Comparison of habitat availability (Table 2) with terrestrial wildlife species richness (as a percentage of 83 total species, Appendix C), Black Butte Copper Project study area, 2014-2015.

Habitat Type 400 (Grassland) totaled about 16 percent of the study area (Table 1). Two subtypes (411 bunchgrass, 413 riparian grass) were mapped in this habitat type. Most of the wildlife species recorded in bunchgrass were also recorded in sagebrush, and many of the species recorded in riparian grass were also recorded in water, willow or sagebrush (Appendix C).

Habitat Type 500 (Agriculture) was represented by a mosaic (510 Hay/530 Tame Pasture) that comprised fields along the Sheep Creek bottom. These habitats totaled <1 percent of the study area (Table 1), and about 18 percent of all species were recorded in them (Figure 2).

3.2 SPECIES LIST

Terrestrial wildlife species potentially occurring in the Black Butte Copper Project study area, as derived from MTNHP (2015), are listed in Appendix A. A total of 379 species (6 amphibians, 8 reptiles, 74 mammals and 291 birds) potentially occur in the region encompassing the study area, reflecting the surrounding landscape (discussed in Section 3.1 above). However, the total number of species that could actually occur in the study area is undoubtedly much smaller because:

- The study area lies on the range periphery of several species. Only one of these species (Baird's sparrow) was recorded in the 2014-2015 evaluation, and/or by other study efforts in or near the project area (Appendix A). Therefore it is likely that some of these species did not occur in the study area.

- As discussed in Section 1.2, elevations in the study area are comparatively high. The study area is near or above the upper elevation limit for several species, based on records reported by MTNHP (2015). It is likely that some of these species either do not occur in the study area, or occur only in small numbers. Only three of these species (spotted towhee, lark sparrow and bobolink) have been recorded (Appendix A).

- Although foraging habitat is available in the study area, roosting or nesting habitat for several species is not available. Only four of these species (great blue heron, bald eagle, Swainson's hawk and belted kingfisher) have been recorded in the study area (Appendix A).

- Some species could migrate through the study area, or pass through the study area (*i.e.*, as transients; Appendix A).

- Some bird species might occur in the study area only in winter. Of these, only one (rough-legged hawk) has been recorded (Appendix A).

- The study area does not support preferred and/or breeding habitat for many species, and/or these habitats are limited or very limited in extent (Appendix A). Approximately 160 of the 379 total potential species (about 42 percent) are in these categories. Not surprisingly, given the small amount of aquatic habitat, about 85 of these species are waterfowl or shorebirds.

A total of 84 species (1 amphibian, 1 reptile, 20 mammals and 62 birds) were recorded during 2014-2015 field work (Appendix C). Although habitat availability for some species (*e.g.*, sora, Wilson's phalarope) was limited, none of the species recorded during the study were unexpected, based on habitat availability (Appendix C). The total is undoubtedly low because many species (*e.g.*, amphibians, reptiles, bats, small mammals and secretive species such as mountain lion) may be difficult to observe by the methods employed during the study. Nevertheless, the Black Butte Copper Project study area is considered to support good wildlife species richness.

3.3 BIG GAME

As discussed previously, big game species potentially occurring in the Black Butte Copper Project terrestrial wildlife resources study area were pronghorn, elk, mule deer, white-tailed deer, moose, black bear and mountain lion. All except moose and mountain lion were recorded in 2014-2015.

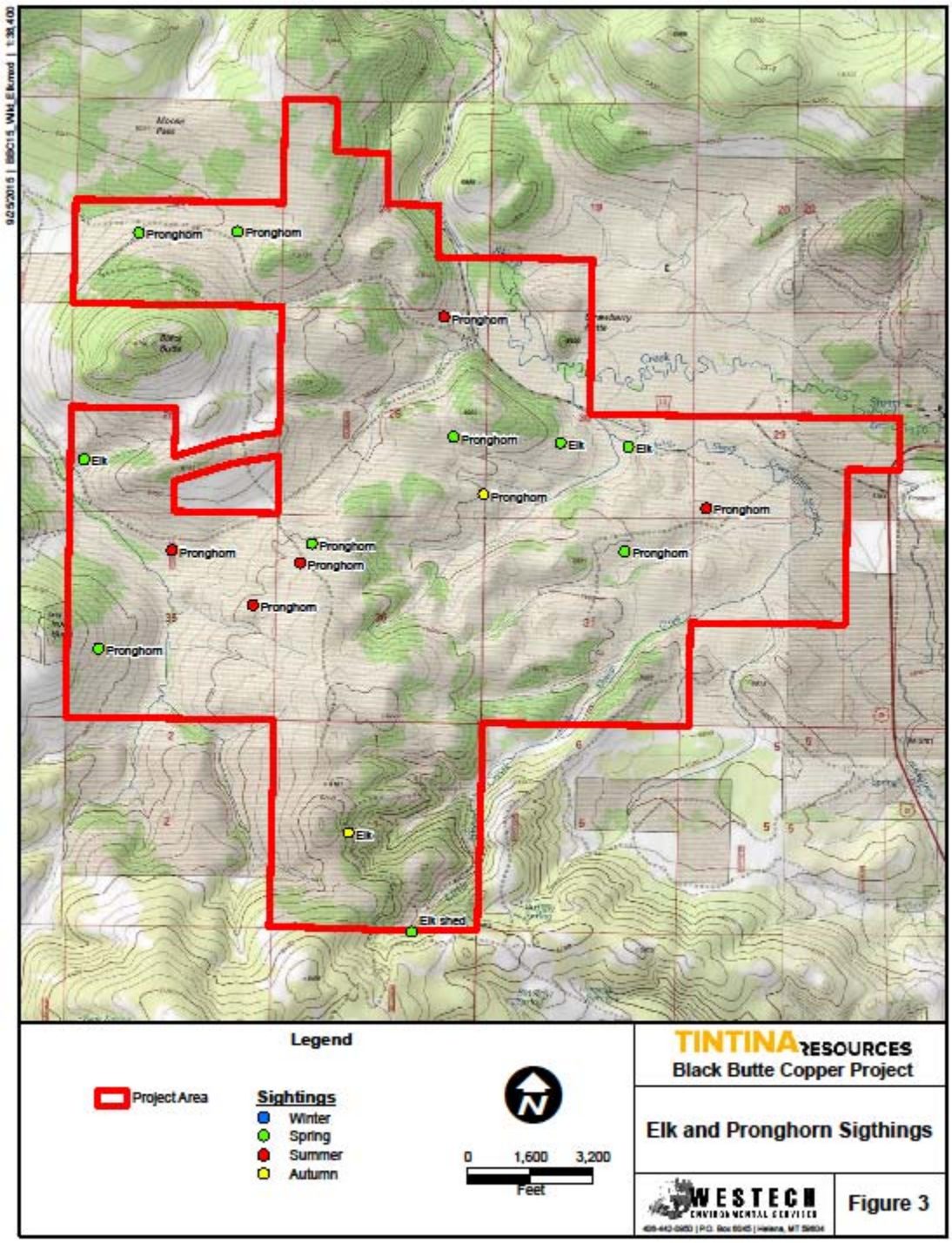
No moose or their evidence were recorded during the 2014-2015 evaluation, although Tintina personnel reported that moose were occasionally seen in the general vicinity.

Mountain lions have been harvested within a few miles of the Black Butte Copper Project (MTNHP 2015) and could occur at least occasionally in the study area, but this secretive species was not recorded by sightings or evidence in 2014-2015.

3.3.1 Pronghorn

Pronghorn sightings are shown in Figure 3. There were 12 sightings totaling 85 pronghorn. They were observed in open habitats throughout the study area, but most sightings came from or near the western third of the study area.

Pronghorn were present in the study area in autumn 2014, but numbers appeared to decline by mid-to-late October. As discussed previously, the study area did not comprise pronghorn winter range, and there were no sightings during winter. Pronghorn winter range is often characterized by sagebrush. Although sagebrush was present in much of the study area (Plate 1), in most years the comparatively high elevations of the study area result in prolonged snow depths that preclude extensive use by pronghorn. FWP's CAPS mapping identified pronghorn winter range 7-8 miles southwest of the study area, and it seems likely that pronghorn that summer in the study area move to this winter range.


Pronghorn
Elk
Elk shed
Legend
Project Area
Sightings
Winter
Spring
Summer
Autumn
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Elk and Pronghorn Sigthings
WESTECH
Figure 3

Pronghorn appeared to return to the study area about mid-April 2015 and numbers increased until early June. Fawning in the study area was not documented, although single females were observed in late May-early June, and fawns were recorded later in summer, suggesting that fawning may have occurred. For much of the summer there appeared to be 11-17 pronghorn in or near the study area, although the maximum number counted was 23 in late July 2015.

Of the 12 sightings recorded during the study, half were in habitat subtype 212 (sagebrush) and half were in subtype 411 (bunchgrass). Pronghorn tracks and hair were also observed at seasonal and permanent ponds (Appendix C).

3.3.2 Elk

There were only 5 sightings totaling 23 elk during the 2014-2015 terrestrial wildlife evaluation (Figure 3). One sighting was in autumn (early October 2014) and four sightings were in spring (April and May 2015). FWP considers the study area to be transitional range between summer and winter elk ranges (Jay Kolbe and Ethan Lula, FWP biologists, personal communication, July 7, 2015). The study area does not comprise elk winter range, although FWP CAPS mapping shows that elk winter range begins 2-3 miles west of the study area.

Although there were only a few sightings, it appeared that elk passed through the study area after mid-October 2014. The autumn 2014 sighting comprised four elk (two cows, two calves) in habitat subtype 160 (Douglas-fir) on October 8. There were no sightings, or observations of evidence (*e.g.*, tracks) in winter. Elk returned in early April, and some elk were present through May. The spring sightings were a single branch-antlered bull (one antler had been shed) in subtype 160, on April 10; a group of nine (6 adult cows, 2 yearling cows and 1 yearling bull) in subtype 212 (sagebrush) on April 10; a group of five (3 adult cows and 2 calves) in subtype 411 (bunchgrass) on May 28; and a group of four (two adult cows and 2 calves) in subtype 413 (riparian grass) on May 28. Elk tracks were also observed at seasonal and permanent ponds (Appendix C). There were no sightings in summer, despite considerable field work in July and early August 2015.

Calving in the study area was not documented, although the observation of young calves in late May suggests that calves may have been born in the study area.

The study area is encompassed by FWP's elk Hunting District (H.D.) 416. FWP flies a winter aerial survey of approximately the western two-thirds of the district, including the study area. In February 2015 FWP counted 843 elk in H.D. 416, including a group of 310 elk about three miles west/northwest of the study area (Ethan Lula, FWP biologist, personal communication, July 7, 2015). The population objective for H.D. 416 is 475 observed wintering elk (FWP 2004). Therefore the population is over objective (Jay Kolbe and Ethan Lula, FWP biologists, personal communication, July 7, 2015).

3.3.3 Mule Deer

Mule and white-tailed deer sightings are shown in Figure 4. Mule deer were present in the study area year-round; as discussed previously, FWP CAPS mapping indicates the study area is considered to be mule deer winter range.

For the year there were only nine sightings totaling 24 mule deer; Tintina personnel reported that mule deer were common, but not abundant, in the study area. Mule deer numbers in Montana have been in a long-term decline (*e.g.*, Newell and Kujala 2013), although the 2014 estimate for mule deer in FWP's administrative Region 4 was similar to the most recent 10-year average (FWP 2015a). H.D. 416 is in FWP's (2001) Prairie/Mountain Foothills population management unit; FWP has identified standard, restrictive and liberal hunting regulations for this unit. The 2015 regulation (FWP 2015b) would be considered restrictive under this classification, indicating that mule deer numbers are less than desired.

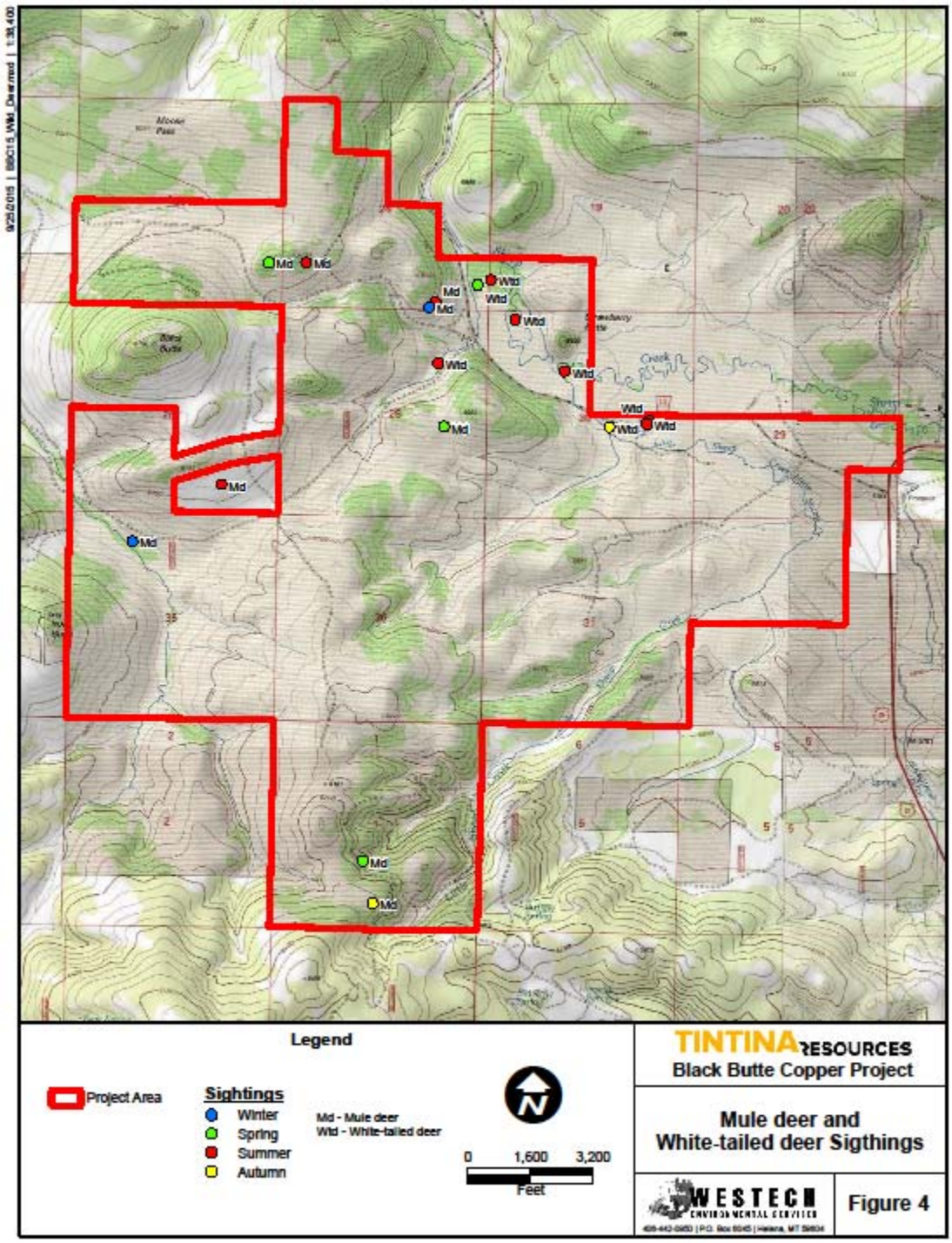
There was a single sighting in autumn 2014, of a group of four mule deer in sagebrush (habitat subtype 212) habitat. There were two observations in winter; one was a group of seven mule deer in habitat subtype 212, while the other was a group of four in habitat subtype 413 (riparian grass). Three sightings were recorded in spring: one was a group of three mule deer in habitat subtype 212, and the other two were single deer observed in habitat subtype 160 (Douglas-fir). There were three observations in summer: a single deer in habitat subtype 212, a single deer in habitat subtype 411 (bunchgrass), and two mule deer in habitat subtype 160. Evidence (tracks, hair, etc.) was also recorded in habitat subtypes 105 (aspen) and 320 (low mesic shrub; Appendix C). The distribution of sightings (Figure 4) and habitat use suggests that mule deer were present in low numbers throughout the study area, and habitat use was not restricted.

3.3.4 White-tailed Deer

There were eight sightings totaling nine white-tailed deer during 2014-2015 (Figure 4). Evidence (tracks, pellet groups) was seen in steam bottom habitats along Sheep Creek and Little Sheep Creek.

As expected, there were no sightings in winter. FWP CAPS mapping does not depict the study area as white-tailed deer winter range. The comparatively high elevations, deep snow, and lack of suitable winter habitat in the study area likely preclude its use as white-tailed deer winter range.

Based on CAPS mapping, it was not apparent where white-tailed deer that summer in the study area might spend the winter. The Smith River bottom west of the study area is not depicted as white-tailed deer winter range. However, FWP biologists think it is likely that white-tails from the study area winter along the Smith River (Ethan Lula, FWP biologist, personal communication, September 21, 2015).


Legend
Project Area
Sightings
Winter
Spring
Summer
Autumn
Md - Mule deer
Wtd - White-tailed deer
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Mule deer and
White-tailed deer Sigthings
WESTECH
Figure 4

There was one sighting in spring, of a single adult doe in hay/tame pasture (habitat subtype 510/530) along Sheep Creek in late May (Figure 4). Assuming that white-tailed deer from the study area winter along the Smith River, they probably arrived in the study area in late April/early May.

There were six sightings totaling seven white-tailed deer in summer. Five observations were recorded along Sheep Creek or Little Sheep Creek, and one along a tributary within 0.25 mile of the Sheep Creek bottom (Figure 4). Three sightings were in willows (habitat subtype 114), one in hay/tame pasture (subtype 510/530), and two in riparian grass (subtype 413). Three sightings were single adult does, two were single adult males, and one observation was an adult doe with a single fawn. Although fawning in the study area was not documented, the presence of a fawn in mid-July suggests that fawning may have occurred in the area.

There was a single sighting in autumn, of an adult male in willows (habitat subtype 114) along Little Sheep Creek in mid-September (Figure 4).

The distribution of sightings (Figure 4) and habitat use suggests that white-tailed deer were present in low numbers, primarily in perennial stream drainages. Movement to other habitats was not restricted, and it is possible that white-tailed deer were present in uplands away from stream bottoms but were simply not observed.

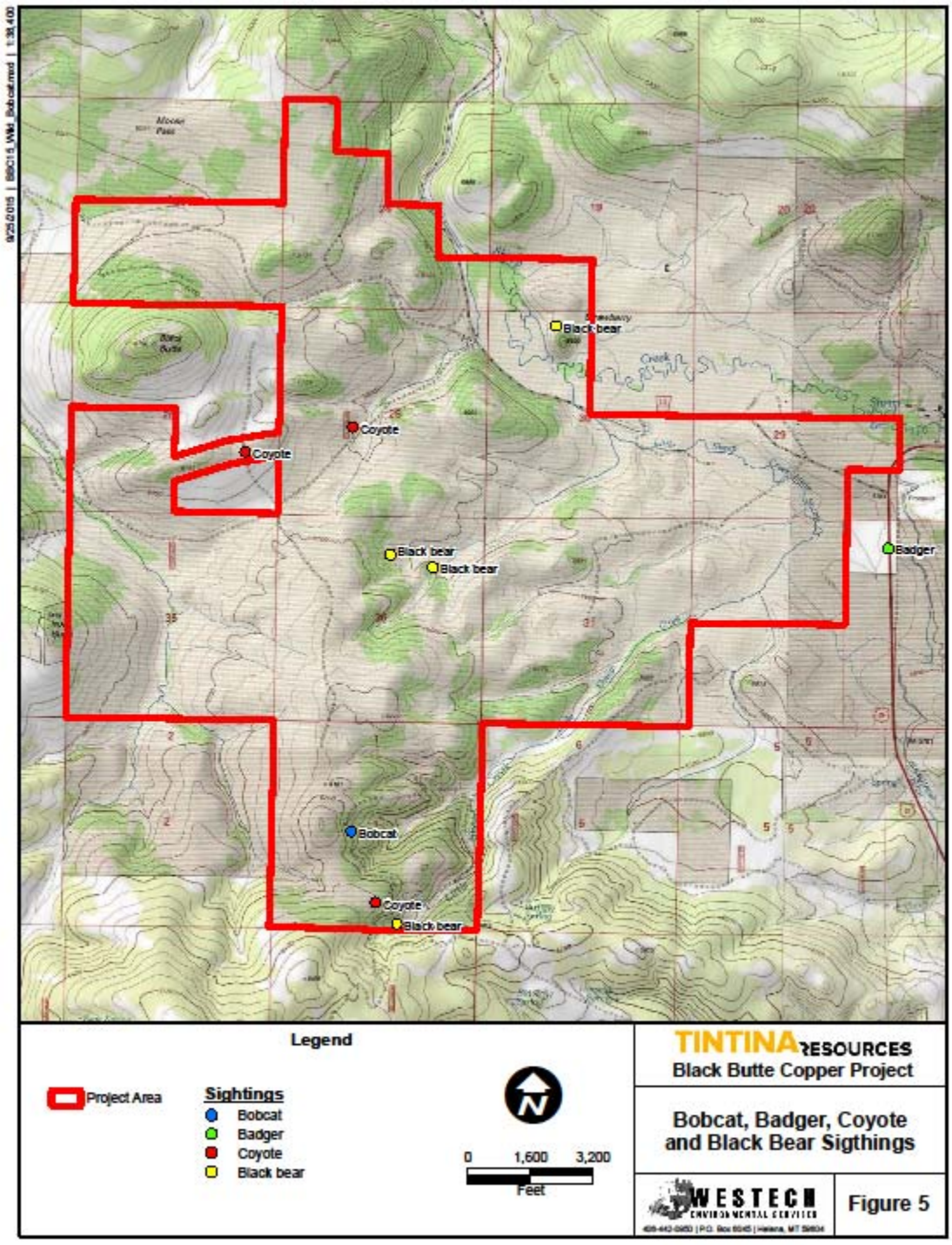
3.3.5 Black Bear

There were four sightings of black bears in 2014-2015 (Figure 5). There was one observation in autumn 2014, of a small (2-year-old?) brown-coated bear at a building site (habitat subtype 021) in the northeast corner of the study area. There was one sighting in spring 2015, of an adult black-coated bear in Douglas-fir (subtype 160) near the south boundary of the study area (Figure 5). In summer there were two sightings, both near the center of the study area (Figure 5), in aspen (subtype 105) and Douglas-fir. Both sightings were of a single, black-coated adult, and were recorded about two weeks apart; it is possible both observations were the same individual.

Evidence (tracks, scats) was also observed at ponds (habitat subtype 002), in aspen (subtype 105), Douglas-fir (subtype 160) and riparian grass (subtype413; Appendix C).

FWP compiles black bear harvest locations and associated data; for the period 2004-2014, there was one reported harvest from the Black Butte Project study area, two others within one mile, and 10+ within six miles (Ethan Lula, FWP biologist, personal communication, July 7, 2015). Although Mace and Chilton-Radant (2011) cautioned that harvest data may not be indicative of black bear population size, these harvest data suggest that black bears are comparatively common in the study area vicinity.

No black bear cubs were observed during the 2014-2015 wildlife evaluation. No evidence of denning was found.


Black bear
Coyote
Coyote
Black bear
Black bear
Badger
Bobcat
Coyote
Black bear
Legend
Project Area
Sightings
Bobcat
Badger
Coyote
Black bear
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Bobcat, Badger, Coyote and Black Bear Sigthings
WESTECH
Figure 5

3.4 MEDIUM-SIZED MAMMALS

Medium-sized mammals were defined to be animals from the size of a Richardson's ground squirrel to the size of a coyote, and included some species that have legal status as furbearers or predators. Medium-sized mammals recorded in the Black Butte Project study area during 2014-2015 included white-tailed jackrabbit (*Lepus townsendii*), mountain cottontail (*Sylvilagus nuttallii*), beaver, porcupine (*Erethizon dorsatum*), yellow-bellied marmot (*Marmota flaviventris*), Richardson's ground squirrel, coyote, bobcat, and badger (*Taxidea taxus*).

White-tailed jackrabbits were considered uncommon in the study area, but were recorded in two habitats: sagebrush (habitat subtype 212), and along an edge between sagebrush and Douglas-fir (subtype 160; Appendix C). Mountain cottontails were considered to be common, and they or their evidence (pellets, hair) were recorded in several habitats (Appendix C).

Old evidence of beaver (chewed stems) was observed in Big Sheep Creek (habitat subtype 002), but beaver appeared to be uncommon/occasional in the study area. Evidence of porcupines (chews) was recorded occasionally in Douglas-fir (subtype 160). Yellow-bellied marmots were seen at rock outcrops and adjacent grasslands (Appendix C) throughout the study area, and were considered to be common. Richardson's ground squirrels were common in open habitats throughout the study area (Appendix C).

Sightings of badger, coyote and bobcat are shown in Figure 5. There was one badger sighting, of a single animal digging in the Highway 89 barrow pit (habitat subtype 020) at the east end of the study area. However, badger diggings were commonly encountered in sagebrush (subtype 212) and bunchgrass (subtype 411) habitats (Appendix C), particularly in Richardson's ground squirrel areas.

Coyotes were recorded three times (Figure 5), in sagebrush (subtype 212) and bunchgrass (subtype 411) habitats. Evidence (tracks, scats, hair) was recorded in most of the habitats in the study area (Appendix C). Therefore coyotes were considered to be common in the study area.

There was one bobcat observation, of a single animal seen in Douglas-fir (subtype 130) habitat near the south boundary of the study area (Figure 5). The MTNHP (2015a) data base contains recent records of bobcats from this region, derived from FWP's furbearer harvest data. Brainerd (1985; cited in MTNHP 2014) reported that female bobcats in western Montana have average annual home ranges of about 60 km^2 (about 23 mi^2) while males have average annual home ranges of about 80 km^2 (about 31 mi^2). Thus, while the study area could lie within the home ranges of one or more bobcats, the Black Butte Copper Project study area (about 8.3 mi^2) would comprise only about 25-35 percent of the average home range of a single bobcat.

3.5 SMALL MAMMALS (excluding bats)

As discussed previously, small mammals were not quantitatively sampled during the study. Consequently, only small mammals that were readily observed were recorded (Appendix C). Most of

these species (e.g., northern pocket gopher *Thomomys talpoides*, red squirrel *Tamiasciurus hudsonicus*, chipmunks *Tamias* spp.) were considered to be common in their preferred habitats. One bushy-tailed woodrat (*Neotomoa cinerea*) midden was found in a rock outcrop (Appendix C). Tintina personnel observed a weasel (*Mustela* spp.) at a building site in the study area (Allan Kirk, geologist, Geomin Resources, personal communication, August 2015).

3.6 BATS

As discussed previously, 15 species of bats possibly occur in Montana; of these, 10-11 potentially occur in the vicinity of the Black Butte Copper Project study area (Appendix A). Unidentified bats were observed in several habitats at dusk in June 2015 (Appendix C).

3.7 UPLAND GAME

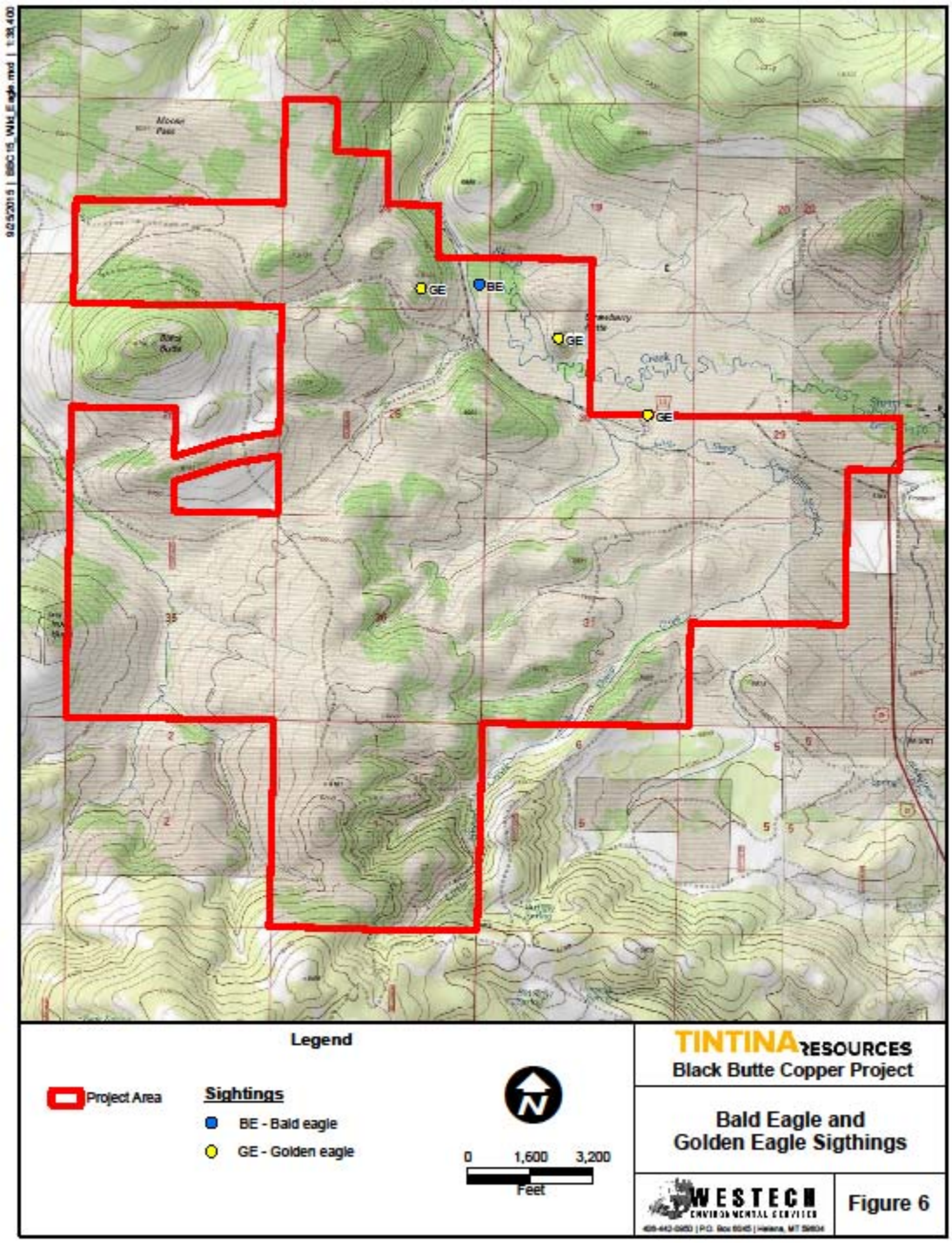
The only upland game bird recorded in the Black Butte Copper Project study area in 2014-2015 was the dusky grouse, although Elliott (2011) also observed ruffed grouse in the area (Appendix A). The study area has suitable habitat for both species; however, displaying males of either species were not heard in spring 2015. Consequently, both species were considered uncommon during the wildlife evaluation.

3.8 RAPTORS

For the purposes of this study, raptors were considered to be members of the Accipitriformes (vultures, eagles and hawks), Falconiformes (falcons) and Strigiformes (owls). Eleven species (bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), rough-legged hawk (*Buteo lagopus*), northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), northern goshawk (*Accipiter gentilis*), American kestrel (*Falco sparverius*), great horned owl (*Bubo virginianus*) and great gray owl (*Strix nebulosa*)) were recorded during 2014-2015 field work. In addition, Elliott (2011) recorded a Swainson's hawk (*Buteo swainsoni*) in the study area in late August 2011 (Appendix A).

There was one sighting of a bald eagle, a juvenile soaring over a hay field (habitat subtype 510/520) in late August 2015 (Figure 6). The nearest bald eagle nest in the MTNHP data base is along the Smith River, about 11 miles from the Black Butte Copper Project. Eagles of both species are often seen in the study area vicinity, particularly during migration (Jay Kolbe, FWP biologist, personal communication, July 7, 2015).

There were three golden eagle observations (Figure 6). One sighting was a bird soaring over Douglas-fir (habitat subtype 160) near Sheep Creek in mid-September 2014; the second was an adult feeding on a Richardson's ground squirrel near Little Sheep Creek in mid-June 2015; and the third was a bird soaring over Douglas-fir near Sheep Creek in late August 2015 (Figure 6). The August and September sightings were consistent with dispersal/migration. The nearest golden eagle nests in the MTNHP data base are along the Smith River, about 11-12 miles from the study area. No other adult or juvenile golden eagles


GE
BE
GE
GE
Legend
Project Area
Sightings
BE - Bald eagle
GE - Golden eagle
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Bald Eagle and
Golden Eagle Sigthings
WESTECH
Figure 6

were observed throughout the rest of the evaluation period, and the most appropriate nesting habitat (Black Butte) was unsuccessfully searched for nests. The paucity of sightings during the nesting season suggests that golden eagles did not nest in or near the study area.

Rough-legged hawks are a migrant/winter resident in Montana. There was one sighting in mid-October 2014, of a bird perched on a rock outcrop in grassland habitat (subtype 411) in the southern portion of the study area (Figure 7). There were no sightings in winter; the comparatively high elevation/deep snow in the open habitats of the study area may have limited prey availability for a diurnal raptor.

Red-tailed hawks were the most commonly observed buteo (broad-winged) raptor during the Black Butte Copper Project terrestrial wildlife evaluation. There were six sightings (Figure 7), comprising one in autumn 2014, four in spring 2015, and one in summer 2015. All were recorded in Douglas-fir habitat (subtype 160).

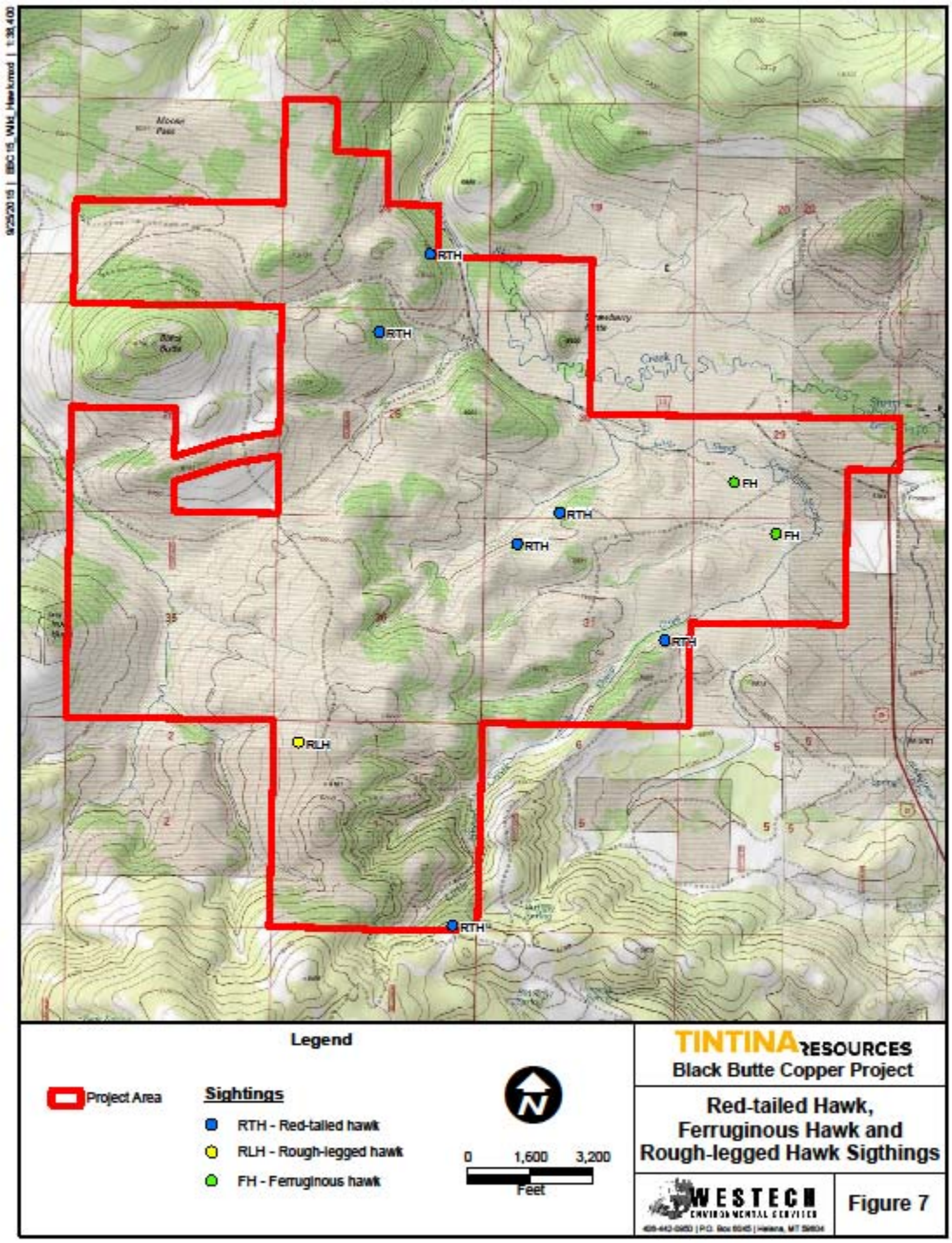
Although red-tailed hawks were present in the study area during nesting season, no active or inactive nests were found. The study area contains suitable nesting habitat (Appendix A). Red-tailed hawks are known to nest at comparatively high elevations, such as those in the study area; for example, Restani (1989) recorded an average nest elevation for red-tailed hawks in the Centennial Valley in southwestern Montana of about 6900 feet. However, the low number and inconsistency of sightings in the study area during the nesting season suggested that red-tailed hawks were not nesting in the area.

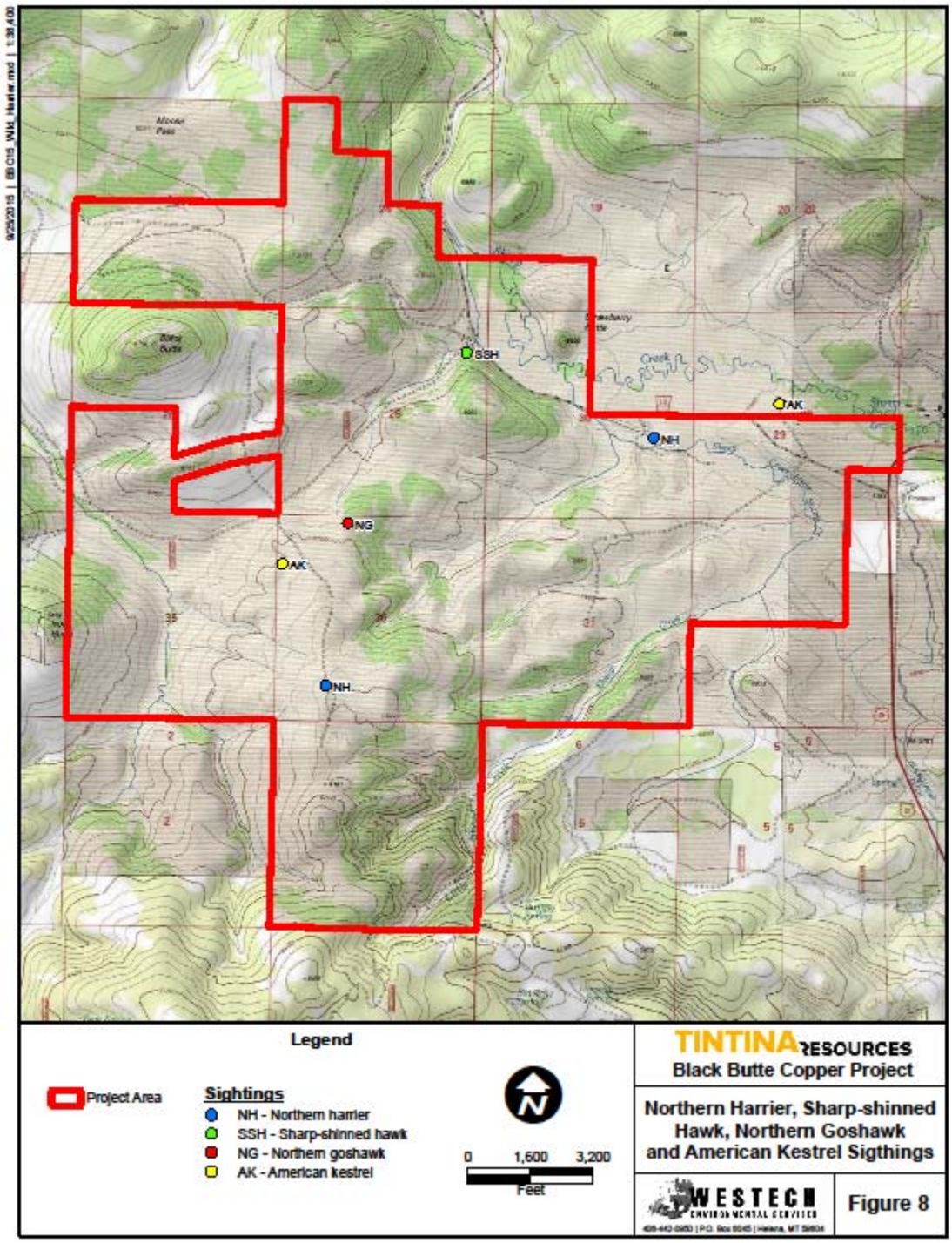
There were two observations of ferruginous hawks (Figure 7), one in September 2014 and the other in September 2015. Both sightings were birds soaring over sagebrush (habitat subtype 212). The study area contained suitable habitat for ferruginous hawks, although this species usually nests at lower elevations than other buteos (*e.g.*, Restani 1989). There are no nesting records of ferruginous hawks within 10 miles of the study area in the MTNHP database. The paucity and timing of sightings suggests that ferruginous hawks did not nest in or near the study area, but were transients/migrants.

There were two sightings of northern harriers, one in spring 2015 and one in summer 2015 (Figure 8). Both were adult males, one recorded over sagebrush (habitat subtype 212) and the other over riparian grass (subtype 413). Most Montana records are below 5500 feet in elevation (MTNHP 2015a). Although the study area contains suitable nesting habitat for northern harriers (Appendix A), the paucity and timing of sightings suggests that northern harriers did not nest in or near the study area.

There was one observation of a sharp-shinned hawk, recorded in early September 2014 in Douglas-fir habitat (Figure 8). Although nesting habitat is available in the study area, given the absence of sightings during the 2015 nesting season, it seems likely that the 2014 sighting was a transient/migrant.

There was one sighting of a northern goshawk, a single adult along the edge between Douglas-fir (habitat subtype 160) and sagebrush habitat (subtype 212) in mid-April 2015 (Figure 8). There are several records of nesting northern goshawks within 10 miles of the study area in the MTNHP database, and the study area contain suitable nesting habitat (Appendix A). The best suitable habitat was


RTH
RTH
FH
RTH
FH
RTH
RTH
RLH
RTH
Legend
Project Area
Sightings
RTH - Red-tailed hawk
RLH - Rough-legged hawk
FH - Ferruginous hawk
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Red-tailed Hawk, Ferruginous Hawk and Rough-legged Hawk Sigthings
WESTECH
Figure 7


SSH
AK
NH
NG
AK
NH
Legend
Project Area
Sightings
NH - Northern harrier
SSH - Sharp-shinned hawk
NG - Northern goshawk
AK - American kestrel
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Northern Harrier, Sharp-shinned Hawk, Northern Goshawk and American Kestrel Sigthings
WESTECH
Figure 8

searched in early June 2015, but failed to find nesting birds. Therefore, the lack of sightings, particularly during the nesting season, suggested that northern goshawks did not nest in the study area.

American kestrels were the only falcon recorded during 2014-2015 field work. There was only one sighting (Figure 8), an adult female flying over grassland habitat (subtype 411) in late June 2015. Although suitable habitat for American kestrels was available in the study area (Appendix A), kestrels normally nest below 5500 feet in Montana (MTNHP 2015a). The low number of sightings in the nesting season suggested that American kestrels did not nest in the study area in 2015.

There was one observation of a great horned owl, a single bird flushed from willows (habitat subtype 114) in mid-July 2015 (Figure 9). No great horned owls were recorded during surveys in late April, mid-May and mid-June 2015.

There was a single sighting of a great gray owl, in early September 2014 (Figure 9). There are many records of great gray owls within 25 miles of the study area, including one about two miles to the northwest (MTNHP 2015a). There are no nesting records within 10 miles of the study area (MTNHP 2015b), but suitable habitat is present in the study area and vicinity.

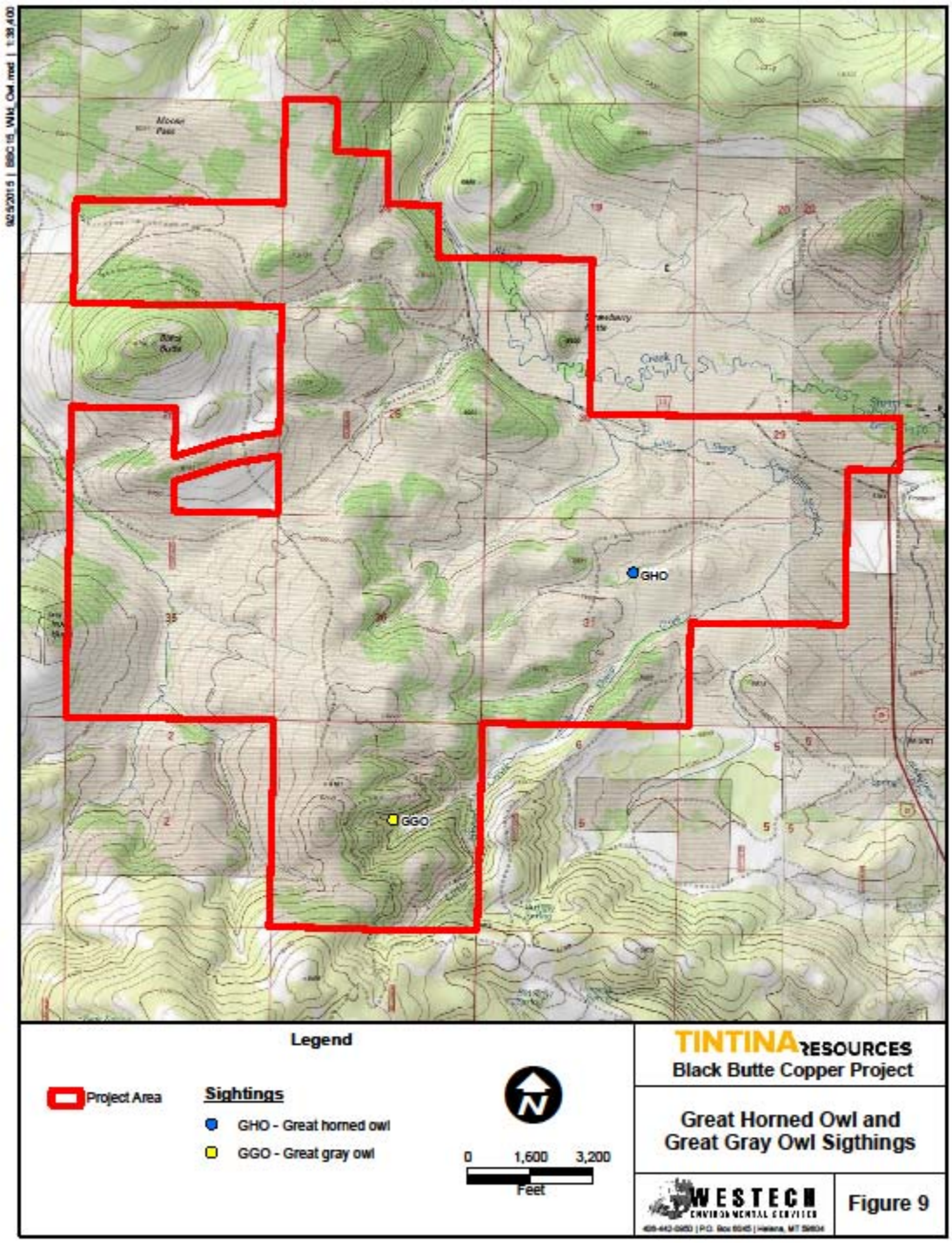
3.9 WATERFOWL AND SHOREBIRDS

As discussed previously, waterfowl were defined as members of the order Anseriformes (geese, ducks and swans) while shorebirds were members of the orders Gaviiformes (loons), Podicipediformes (grebes), Pelecaniformes (pelicans and cormorants), Ciconiiformes (herons, bitterns, ibises, *etc.*), Gruiformes (cranes, rails, coots, *etc.*) and Charadriiformes (plovers, snipe, sandpipers, avocets, phalaropes, gulls, terns, *etc.*).

Aquatic habitat was very limited in the study area. Not surprisingly, only 11 species of waterfowl and shorebirds were recorded during the evaluation (Appendices A, C), and most were recorded at the small, man-made pond on Little Sheep Creek (Plate 1). Mallards nested successfully near this pond; gadwall and green-winged teal were recorded there during migration. Canada geese were recorded at the pond and along the Sheep Creek bottom during nesting season, but successful nesting was not verified (i.e., no broods were observed).

Great blue herons were occasionally observed along Sheep Creek, but nesting was not documented. Most Montana records are from below 5000 feet in elevation; egg laying occurs from early April to early May (MTNHP 2015a). Thus, the study area may be at too high elevation to support nesting.

Killdeer, sora, Wilson's snipe and Wilson's phalarope were all recorded at or near the Little Sheep Creek pond. Killdeer chicks were observed along the Sheep Creek road in July. Wilson's snipe chicks were seen along the Little Sheep Creek bottom in late May and early June 2015. Belted kingfishers were observed along Little Sheep Creek and Sheep Creek, but nesting was not documented.


GHO
GGO
Legend
Project Area
Sightings
GHO - Great horned owl
GGO - Great gray owl
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Great Horned Owl and
Great Gray Owl Sigthings
WESTECH
Figure 9

Sandhill cranes were regularly observed in drainages in the east half of the study area from May through August 2015, and were sometimes more than 0.25 mile from water (Figure 10). Two chicks were observed with two adults along a tributary of Little Sheep Creek in late June 2015.

3.10 LANDBIRDS

As discussed previously, landbirds were defined as all species except upland game, raptors, waterfowl and shorebirds. Most of the birds recorded in 2014-2015 were landbirds (Appendix A, C).

In addition to the 62 bird species recorded in 2014-2015, Elliott (2011) observed six species that were not recorded in 2014-2015, and ASC data included eight species that were not recorded by Elliott (2011) or 2014-2015 field work. Thus there have been 76 landbird species recorded in the Black Butte Copper Project study area over the years.

3.11 AMPHIBIANS AND REPTILES

No amphibians were recorded during the study, but Stagliano (2015) observed the Columbia spotted frog (*Rana luteiventris*) in the area (Appendix A). Appropriate breeding habitat was available in seasonal ponds, or in the man-made pond along Little Sheep Creek, but no adults, egg masses or larvae were observed at any of these sites.

The only reptile observed during 2014-205 was the common gartersnake (Appendix A). There were several sightings, all in stream bottom habitats (Appendix C).

3.12 ENDANGERED OR THREATENED SPECIES

As discussed in Section 2.12, the USFWS (2015) identified three terrestrial wildlife species that are listed, proposed or candidates for listing under the ESA: Canada lynx (listed threatened), greater sage-grouse (candidate) and Sprague's pipit (candidate). The probability of any of these species occurring in the study area is considered very low, and any such occurrences would likely be transient individuals. No endangered or threatened species were recorded by sightings or evidence during the 2014-2015 evaluation. None have been recorded in the MTNHP (2015b) data base within 10 miles of the study area.

3.13 SPECIES OF CONCERN

The Black Butte Copper Project study area has at least small amounts of preferred habitat for 47 Species of Concern, Potential Species of Concern, or Special Status Species (1 amphibian, 1 reptile, 16 mammals and 29 birds; Appendix A). The potential occurrence of these species in the or near the Project area is presented in Table 2. Of these, 13 species (0 amphibians, 0 reptiles, 1 mammals and 12 birds) were recorded in or near the Project area:

The porcupine was addressed in Section 3.4.

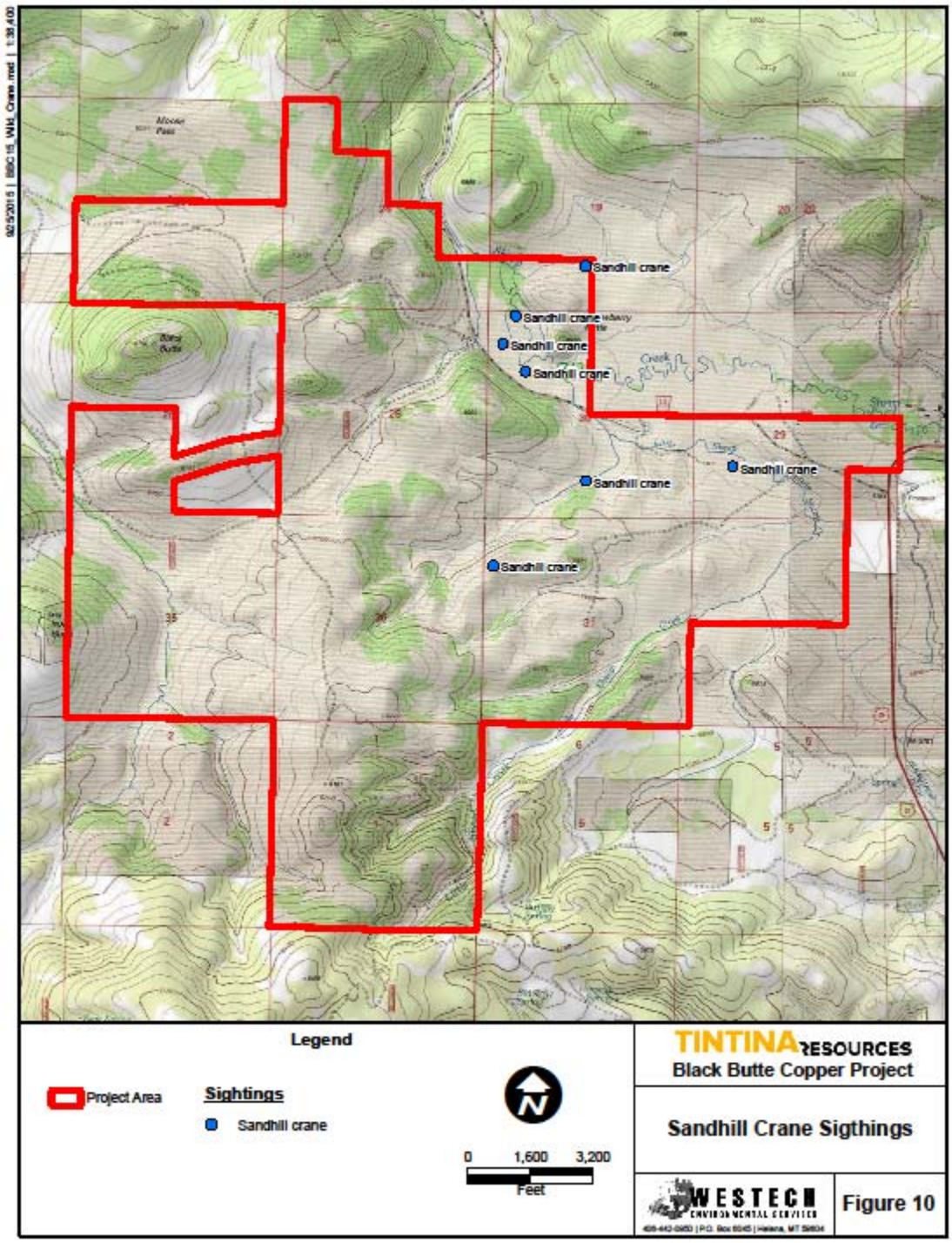

Sandhill crane
Sandhill crane
Sandhill crane
Sandhill crane
Sandhill crane
Sandhill crane
Sandhill crane
Legend
Project Area
Sightings
Sandhill crane
0
1,600
3,200
Feet
TINTINA RESOURCES
Black Butte Copper Project
Sandhill Crane Sigthings
WESTECH
Figure 10

Table 2. Potential occurrence of Species of Concern, Potential Species of Concern, or Special Status Species in the Black Butte Copper Project study area.

Species[a]	Preferred and/or breeding habitat in the Project area[a]	Recorded in or near the Project area[a]	Recorded within 10-12 miles of Project area[b]	Potential occurrence in or near Project area[c]
Amphibians				
Western toad	Yes		X	High
Reptiles				
Western milksnake	Yes? (may be on range periphery)			Low
Mammals				
Hayden's shrew	Yes? (may be on range periphery)			Low
Merriam's shrew	Yes? (may be on range periphery)			Low
Dwarf shrew	Yes			Moderate
Preble's shrew	Yes			Moderate
Townsend's big-eared bat	Yes			Moderate
Spotted bat	No? (no preferred roosting habitat; near upper elevation limit)			Low
Silver-haired bat	Yes			Moderate
Hoary bat	Yes			Moderate
Little brown myotis	Yes			Moderate
Fringed myotis	Yes			Moderate
Porcupine	Yes	X		Very high
Water vole	Yes? (may be on range periphery)			Low
White-footed mouse	Yes			Moderate
Swift fox	Yes? (may be on range periphery)			Low
Canada lynx	Yes? (limited)			Low
Grizzly bear	Yes			Low
Birds				
Greater sage-grouse	Yes		X	Moderate
Great blue heron	Yes (no nesting habitat)	X	X	Very high
Bald eagle	Yes (no nesting habitat)	X	X	Very high
Northern goshawk	Yes	X	X	Very high
Ferruginous hawk	Yes	X		Very high
Golden eagle	Yes	X	X	Very high
Long-billed curlew	Yes		X	Moderate
Western screech-owl	Yes? (may be on range periphery)			Low

Species[a]	Preferred and/or breeding habitat in the Project area[a]	Recorded in or near the Project area[a]	Recorded within 10-12 miles of Project area[b]	Potential occurrence in or near Project area[c]
Northern hawk owl	Yes			Moderate
Great gray owl	Yes	X		Very high
Short-eared owl	Yes			Moderate
Common poorwill	Yes			Moderate
Rufous hummingbird	Yes	X		Very high
Pileated woodpecker	Yes? (very limited)			Low
Loggerhead shrike	Yes			Moderate
Plumbeous vireo	Yes? (may be on range periphery)			Low
Clark's nutcracker	Yes	X	X	Very high
Brown creeper	Yes? (limited)		X	Moderate
Varied thrush	Yes? (limited)			Low
Sage thrasher	Yes			Moderate
Green-tailed towhee	Yes? (very limited)			Low
Brewer's sparrow	Yes	X	X	Very high
Sagebrush sparrow	Yes? (may be on range periphery)			Low
Baird's sparrow	Yes? (may be on range periphery)	X		Very high
Bobolink	Yes? (very limited) (near upper elevation limit)	X	X	Very high
Gray-crowned rosy-finch	Yes (no nesting habitat)			Moderate
Black rosy-finch	Yes (no nesting habitat)			Moderate
Cassin's finch	Yes	X	X	Very high
Evening grosbeak	Yes		X	Moderate

[a]Appendix A

[b]MTNHP 2015(b)

[c]Professional opinion based on the following: very high = has been recorded in or near the study area; high = preferred habitat available in the Project area, and has been recorded within 10-12 miles of the Project area; moderate = has not been recorded in or within 10-12 miles of the Project area, but preferred habitat available, or could occur as transient; low = preferred habitat may not be available in Project area, may be on periphery or range, may be near upper elevation limit, or likelihood of occurring as transient is low

Bald and golden eagles, northern goshawk, ferruginous hawk and great gray owl were discussed in Section 3.8. The great blue heron was addressed in Section 3.9.

The rufous hummingbird is a Potential Species of Concern (a native species "…for which current, often limited, information suggests potential vulnerability. Also included are animal species [for] which additional data are needed before an accurate status assessment can be made" (MTNHP 2015b)). It is assigned a global rank of G5 ("common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range" (MTNHP and FWP 2015)) and a state rank of S4B

(breeding species; "apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining" (MTNHP and FWP 2015)). In the Black Butte Copper Project study area, it was recorded in July in aspen (subtype 110) and willow (subtype 114) habitats (Appendix C).

The Clark's nutcracker is a Species of Concern that is assigned a global rank of G5 and a state rank of S3 (MTNHP and FWP 2015). It is dependent on conifer seeds, particularly pine seeds. Loss of pines (whitebark, limber, ponderosa) to fire, disease, and bark beetle outbreaks could impact populations (MTNHP 2015a). Clark's nutcrackers were regularly seen in the Black Butte Copper Project study area, always in Douglas-fir habitats (habitat subtype 160; Appendix C).

The Brewer's sparrow is a Species of Concern, assigned a global rank of G5 and a state rank of S3B (MTNHP and FWP 2014). It is considered to be a characteristic species of sagebrush habitat; loss of sagebrush habitat is a threat (MTNHP 2015a). Brewer's sparrows were not observed in 2014-2015 field work but were recorded in the study area in the past (Appendix A).

The Baird's sparrow was recorded in sagebrush habitat (subtype 212) in late May, and was never recorded again. It is possible these birds were migrants/transients, since the study area is on the range periphery of this species (Appendix A).

Bobolinks were observed in habitat subtypes 510/530 (hay/tame pasture) along the Sheep Creek bottom in July 2015. The project area is near the upper elevation limit for this species, and preferred habitat (old fields) was comparatively limited.

Cassin's finches were not observed in 2014-2015 field work but were recorded in the study area in the past (Appendix A).

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Appendix A. Terrestrial wildlife resources of the Black Butte Copper Project vicinity.

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
AMPHIBIANS[3]				
Caudata				
Western tiger salamander (*Ambystoma mavortium*)		Ponds, lakes and springs in prairie and agricultural habitats, usually without fish present.	Yes? [5](may be on range periphery)	
Anura				
Plains spadefoot (*Spea bombifrons*)[4]		Prairie ponds with sandy soils and/or gravel-loam.	No	
Western toad (*Anaxyrus boreas*)		A wide variety of terrestrial habitats, may be found far from breeding sites; breeds in clean, standing water.	Yes	
Boreal chorus frog (*Pseudacris maculata*)		Damp prairies. Breeds in potholes and reservoirs.	Yes	
Columbia spotted frog (*Rana luteiventris*)		Wetlands in forested and non-forested habitats.	Yes	
Northern leopard frog (*Lithobates pipiens*)		Short grasslands near water; breeds in wetland habitats.	Yes? (may be near upper elevation limit)	
REPTILES[3]				
Testudines				
Painted turtle (*Chrysemys picta*)		Aquatic environments (≤5200 ft) with mud bottoms, little current and ample aquatic vegetation.	No (above upper elevation limit)	
Squamata				
Rubber boa (*Charina bottae*)		Usually associated with forest habitat, but may be found in grasslands and sagebrush.	Yes	
North American racer (*Coluber constrictor*)		Open habitats such as prairie, sagebrush, badlands.	Yes	
Western milksnake (*Lampropeltis gentilis*)		Open sagebrush-grassland, pine savannah and badlands, often near rock outcrops.	Yes? (may be on range periphery)	
Gophersnake (*Pituophis catenifer*)		Dry habitats such as short-grass prairie (≤5200 ft), sagebrush and pine savannah.	No (near upper elevation limit)	
Terrestrial gartersnake (*Thamnophis elegans*)		Moist habitats near water.	Yes	
Common gartersnake (*Thamnophis sirtalis*)		Wide variety of habitats and elevations, but often near water.	Yes	X
Prairie rattlesnake (*Crotalus viridis*)		Open, arid country; mixed grass-coniferous forest; rock outcrops.	Yes	
MAMMALS[3]				
Soricomorpha				
Masked (common) shrew (*Sorex cinereus*)		Drier coniferous forests.	Yes	
Hayden's (prairie) shrew (*Sorex haydeni*)		Grassy habitats, particularly moist grassland.	Yes? (may be on range periphery)	
Merriam's shrew (*Sorex merriami*)		Arid sagebrush-steppe, non-native grasses and forbs, poorly developed riparian habitat at creekside	Yes? (may be on range periphery)	
Dwarf shrew (*Sorex nanus*)		Wide variety of habitats.	Yes	
Dusky or Montane shrew (*Sorex monticolus*)		Mid- to high elevation forests; alpine tundra; stream bottoms.	Yes	
Water shrew (*Sorex palustris*)		Streamside habitat in coniferous forests, seasonal streams and seeps, particularly with overhanging banks.	Yes	
Preble's shrew (*Sorex preblei*)		Sagebush/grassland; sagebrush openings in coniferous forest.	Yes	
Vagrant shrew (*Sorex vagrans*)		Moist sites in coniferous forests.	Yes	
Chiroptera				
Townsend's big-eared bat (*Corynorhinus townsendii*)		Roosts in caves and abandoned mines in Douglas-fir, lodgepole pine, ponderosa pine and cottonwood stands.	Yes	
Spotted bat (*Euderma maculatum*)		Roosts in cliffs and steep canyons; forages in a wide variety of habitats, usually below 6000 feet in elevation.	No? (no preferred roosting habitat; near upper elevation limit)	
Silver-haired bat (*Lasionycteris noctivagans*)		Mature conifer and deciduous forests with nearby water; riparian woodlands. Day roosts include tree cavities, under loose bark, bird nests, and buildings. Hibernacula include tree cavities, under loose bark, and buildings.	Yes	
Big brown bat (*Eptesicus fuscus*)		Open and forested areas near water; day roosts include attics, barns, bridges and bat houses. Hibernacula include caves and mines.	Yes	
Hoary bat (Lasiurus cinereus)		Forests, riparian corridors; roosts in trees, sometimes in crevices.	Yes	

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
California myotis (*Myotis californicus*)		Forests; roosts in trees, crevices and buildings.	Yes? (may be on range periphery)	
Long-eared myotis (*Myotis evotis*)		Wide variety of rocky and forested habitats; roosts in buildings, bridges, hollow trees, stumps, bark of trees, rock fissures.	Yes	
Western small-footed myotis (*Myotis ciliolabrum*)		Mesic and arid conifer forest; riparian woodland. Roosts in rock outcrops, clay banks, loose bark, buildings, bridges, caves and mines. Hibernates in caves and mines.	Yes	
Little brown myotis (*Myotis lucifugus*)		Wide variety of habitats; forages over water; roosts in cliffs, caves and human-made structures.	Yes	
Long-legged myotis (*Myotis volans*)		Primarily in forested mountains and river bottoms. Roosts in buildings, trees, rock fissures, fissures in stream banks. Hibernacula include caves and mines.	Yes	
Fringed myotis (*Myotis thysanodes*)		Ponderosa pine, Douglas-fir, cottonwood, sagebrush-grassland; roosts in crevices, caves, mines, buildings.	Yes	
Lagomorpha				
Pika (*Ochotona princeps*)		Mid- to high elevation talus, slides, boulder fields, rock rubble near meadows.	No	
White-tailed jackrabbit (*Lepus townsendii*)		Grassland, sagebrush-grassland.	Yes	X
Snowshoe hare (*Lepus americanus*)		Fairly dense stands of young pole-sized timber; openings, forest edges.	Yes	
Mountain cottontail (*Sylvilagus nuttallii*)		Shrub-filled gullies and forest edges.	Yes	X
Rodentia				
Beaver (*Castor canadensis*)	FB	Wide variety of aquatic habitats with woody riparian vegetation.	Yes	X, E
Porcupine (*Erethizon dorsatum*)		Coniferous and deciduous forests, brushy and riparian habitats.	Yes	X
Northern pocket gopher (*Thomomys talpoides*)		Wide variety of habitats; avoids dense forest and areas with shallow, rocky soils.	Yes	X, E
Southern red-backed vole (*Myodes gapperi*)		Usually dense subalpine forests; more open forest types; alpine.	Yes	
Sagebrush vole (*Lemmiscus curtatus*)		Sagebrush flats, particularly *Artimisia tridentata*	Yes	
Long-tailed vole (*Microtus longicaudus*)		Wide variety of habitats from grassland to boreal forest.	Yes	
Montane vole (*Microtus montanus*)		Usually dry grassland or sagebrush/grassland. Will use wet meadows and marshes if meadow vole is not present.	Yes	
Prairie vole (*Microtus ochrogaster*)		Dray grassland and sagebrush; will occupy riparian habitat in absence of meadow vole.	Yes	
Meadow vole (*Microtus pennsylvanicus*)		Moist to wet grasslands.	Yes	
Water vole (*Microtus richardsoni*)		Near streams and lakes, usually above 5000 ft.	Yes? (may be on range periphery)	
Heather vole (*Phenacomys intermedius*)		Most common in subalpine spruce-fir forest with shrubby ground cover; also alpine, timberline krummholz, montane yellow pine/Douglas-fir forests with bearberry/twinflower understory.	No	
Bushy-tailed woodrat (*Neotoma cinerea*)		Rock slides, outcrops, crevices, badlands and buildings in a variety of habitats.	Yes	X
Muskrat (*Ondatra zibethicus*)	FB	Streams, rivers, ponds, marshes with herbaceous vegetation and non-freezing attributes. Usually avoids fast flowing water.	Yes? (limited)	
Northern grasshopper mouse (*Onychomys leucogaster*)		Wide variety of open habitats.	Yes	
White-footed mouse (*Peromyscus leucopus*)		Riparian woodlands, thickets.	Yes	
Deer mouse (*Peromyscus maniculatus*)		All habitats; usually not seen in wetlands.	Yes	X
House mouse (*Mus musculus*)		Buildings, agricultural fields, grassy meadows, marsh.	Yes? (limited)	
Black-tailed prairie dog (*Cynomys ludovicianus*)		Lower elevation flat, open grasslands and shrub/grasslands.	No	
Yellow-bellied marmot (*Marmota flaviventris*)		Talus slopes, rock outcrops near meadows and grasslands; avoids dense forest.	Yes	X
Northern flying squirrel (*Glaucomys sabrinus*)		Montane and subalpine coniferous forests; riparian cottonwood forests.	Yes	
Red squirrel (*Tamiasciurus hudsonicus*)		Coniferous forests.	Yes	X
Richardson's ground squirrel (*Urocitellus richardsonii*)		Shortgrass prairies, heavily grazed pastures, shrub-steppe	Yes	X, E
Golden-mantled ground squirrel (*Callospemophilus lateralis*)		Montane and subalpine forests wherever rocky habitat is present.	Yes? (may be on range periphery)	
Thirteen-lined ground squirrel (*Spermophilus tridecemlineatus*)		Wide variety of grasslands; may prefer grazed or mowed grasslands.	Yes? (may be on range periphery)	
Yellow-pine chipmunk (*Tamias amoenus*)		Open stands of ponderosa pine and Douglas-fir.	Yes	X

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Least chipmunk (*Tamias minimus*)		Sagebrush, brushy grasslands, coniferous forest, alpine tundra. Habitat preference influenced by sympatric chipmunks.	Yes	X
Western jumping mouse (*Zapus princeps*)		Tall, lush grass and forbs, often near water. Mesic forests with sparse understory.	Yes	
Carnivora				
Gray wolf (*Canis lupus*)	DM, NM	Wide variety of habitats dependent upon prey availability.	Yes	
Coyote (*Canis latrans*)	PM	Wide variety of habitats.	Yes	X, E
Swift fox (*Vulpes velox*)	FB	Open prairies and arid plains	Yes? (may be on range periphery)	
Red fox (*Vulpes vulpes*)		Wide variety of habitats.	Yes	
Mountain lion (*Puma concolor*)	BG	Any habitat with good cover and prey availability.	Yes	
Canada lynx (*Lynx canadensis*)	LT, FB	Mid- to high elevation subalpine forests with snowshoe hares. Could occur as transient.	Yes? (limited)	
Bobcat (*Lynx rufus*)	FB	Wide variety of habitats, usually with rocky areas.	Yes	X
Striped skunk (*Mephitis mephitis*)	PM	Wide variety of habitats.	Yes	
Wolverine (*Gulo gulo*)	FB	Large, mountainous and essentially roadless areas. Could occur as transient.	No	
Northern river otter (*Lontra canadensis*)	FB	High flow volume water, densely vegetated and undercut banks; large streams and rivers in winter.	Yes? (limited)	
Marten (*Martes americana*)	FB	Mature conifer or mixed forests, usually subalpine, with ≥35% canopy cover.	Yes? (may be on range periphery)	
Short-tailed weasel (*Mustela ermina*)	PM	Montane forest associations. Brushy or wooded areas, usually not far from water, with high prey densities.	Yes	
Long-tailed weasel (*Mustela frenata*)	PM	Almost all habitats, usually near water.	Yes	
Least weasel (*Mustela nivalis*)	PM	Variety of habitats with small mammals; avoids dense forest.	Yes	
American mink (*Mustela vison*)	FB	Aquatic habitats with prey.	Yes	
Badger (*Taxidea taxus*)		Grassland and shrub-grassland.	Yes	X
Raccoon (*Procyon lotor*)		Diverse habitats, usually near water.	Yes	
Black bear (*Ursus americanus*)	BG	Wide variety of habitats; habitat use linked to food availability.	Yes	X
Grizzly bear (*Ursus arctos*)	LT	Wide variety of habitats. Could occur as transient.	Yes	
Artiodactyla				
Pronghorn (*Antilocapra americana*)	BG	Open, rolling grasslands and sagebrush.	Yes	X
Moose (*Alces americanus*)	BG	Variable. Coniferous forest, river valleys, mountain meadows, clearcuts, willow flats, swampy areas.	Yes	
Elk (*Cervus elaphus*)	BG	Highly adaptable to a wide variety of habitats.	Yes	X, E
Mule deer (*Odocoileus hemionus*)	BG	Conifer and mixed forests, pine savannah, badlands, grasslands, sagebrush, river and creek bottoms, agriculture.	Yes	X, E
White-tailed deer (*Odocoileus virginianus*)	BG	Dense coniferous forests, river and creek bottoms, particularly with woody riparian habitat.	Yes	X, E
BIRDS[6]				
Anseriformes				
Greater white-fronted goose (*Anser albifrons*)	MG	Migrant; agricultural fields, marshes, and prairies.	No	
Snow goose (*Chen caerulescens*)	MG	Migrant; grain fields, lakes, and marshes.	No	
Ross' goose (*Chen rossii*)	MG	Migrant; grain fields, lakes, and marshes.	No	
Canada goose (*Branta canadensis*)	MG	Lakes, ponds, rivers with adjacent agricultural and other open lands.	Yes? (limited)	X, E
Trumpeter swan (*Cygnus buccinator*)	MG	Migrant; large lakes and ponds.	No	
Tundra swan (*Cygnus columbianus*)	MG	Migrant; large lakes and ponds.	No	
Wood duck (*Aix sponsa*)	MG	Creeks, rivers, marshes, swamps and ponds. Nests in tree cavities or next boxes.	Yes? (no nesting habitat)	
Gadwall (*Anas strepera*)	MG	Wetlands, nests in dense cover near water.	Yes? (limited)	X
Eurasian wigeon (*Anas penelope*)	MG	Migrant; shallow water, fields, and meadows.	No	
American wigeon (*Anas americana*)	MG	Shallow wetlands, nests in brushy and grassy uplands.	Yes? (limited)	
Mallard (*Anas platyrhynchus*)	MG	Highly adaptable; nests in dense cover near water.	Yes	X
Blue-winged teal (*Anas discors*)	MG	Nests in herbaceous vegetation near shallow ponds.	Yes? (limited)	
Cinnamon teal (*Anas cyanoptera*)	MG	Large marshes, reservoirs, slow streams, ditches and ponds.	Yes? (limited)	
Northern shoveler (*Anas clypeata*)	MG	Marsh areas of lakes and ponds.	Yes? (very limited)	
Northern pintail (*Anas acuta*)	MG	Wetlands in prairie grasslands.	Yes? (very limited)	
Green-winged teal (*Anas crecca*)	MG	Ponds and marshes in deciduous parklands, grasslands, sedge meadows and thickets.	Yes? (very limited)	X
Canvasback (*Aythya valisineria*)	MG	Small lakes and bays, deep-water marshes, ponds, potholes and shallow rivers.	No	

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Redhead(*Aythya americana*)	MG	Lakes and ponds.	Yes? (very limited)	
Ring-necked duck (*Aythya collaris*)	MG	Open water, wetlands abundant aquatic vegetation.	No	
Greater scaup (*Aythya marila*)	MG	Migrant; lakes, ponds and large wetlands with no flowing water.	No	
Lesser scaup (*Aythya affinis*)	MG	Lakes, rivers and large wetlands.	No	
Harlequin duck (*Histrionicus histrionicus*)	MG	Fast moving, low gradient, clear mountain streams.	No	
Surf scoter (*Melanitta perspicillata*)	MG	Migrant; large lakes and reservoirs.	No	
White-winged scoter (*Melanitta fusca*)	MG	Migrant, large lakes, reservoirs and rivers.	No	
Long-tailed duck (*Clangula hyemalis*)	MG	Migrant; lakes, large rivers.	No	
Bufflehead (*Bucephala albeola*)	MG	Ponds with no outlets, small lakes.	No	
Common goldeneye (*Bucephala clangula*)	MG	Forested wetlands, lakes and rivers.	No	
Barrow's goldeneye)*Buchephala islandica*)	MG	Forested alkaline to freshwater lakes and ponds, beaver ponds, small sloughs.	No	
Hooded merganser (*Lophodytes cucullatus*)	MG	Rivers with adjacent riparian forests.	No	
Common merganser (*Mergus merganser*)	MG	Large lakes and rivers.	No	
Red-breasted merganser (*Mergus serrator*)	MG	Migrant; lakes, ponds, and rivers.	No	
Ruddy duck (*Oxyura jamaicensis*)	MG	Breeds in overgrown, shallow marshes with abundant emergent vegetation.	No	
Galliformes				
Gray partridge (*Perdix perdix*)	UG	Grasslands interspersed with cultivated fields.	No	
Ring-necked pheasant (*Phasianus colchicus*)	UG	Brushy and/or herbaceous cover near open grasslands and agricultural fields.	Yes? (very limited)	
Ruffed grouse (*Bonasa umbellus*)	UG	Dense forested or brushy areas, often along streams.	Yes	E
Greater sage-grouse (*Centrocercus urophasianus*)	C, UG	Sagebrush; may use adjacent hay fields.	Yes	
Dusky grouse (*Dendragapus obscurus*)	UG	Conifer forest edges and openings.	Yes	X
Sharp-tailed grouse (*Tympanuchus phasianellus*)	UG	Native grasslands with shrub-filled coulees.	Yes	
Wild turkey (*Meleagris gallopavo*)	UG	Open riparian, coniferous and deciduous forests.	No	
Gaviiformes				
Pacific loon (*Gavia pacifica*)		Migrant; lakes with adequate prey (small fish).	No	
Common loon (*Gavia immer*)		Migrant; lakes with adequate prey (small fish).	No	
Podicipediformes				
Pied-billed grebe (*Podilymbus podiceps*)		Marshes and open waterbodies.	No	
Horned grebe (*Podiceps auritus*)		Migrant; marshes and shallow ponds with emergent vegetation.	No	
Red-necked grebe (*Podiceps grisegena*)		Migrant; a variety of smaller, usually lowland waterbodies.	No (near upper elevation limit)	
Eared grebe (*Podiceps nigricollis*)		Shallow lakes/ponds with emergent vegetation.	Yes? (very limited)	
Western grebe (*Aechmophorus occidentalis*)		Large lakes and marshes with emergent vegetation.	No	
Clark's grebe (*Aechmophorus clarkii*)		Migrant; large lakes and rivers.	No	
Suliformes				
Double-crested cormorant (*Phalacrocorax auritus*)		Large-bodied aquatic habitats with fish and suitable roosting sites (large dead trees, bare branches, etc.).	No	
Pelecaniformes				
American white pelican (*Pelecanus erythrorhynchos*)		Migrant; rivers, lakes and other waterbodies.	No	
American bittern (*Botaurus lentiginosus*)		Large wetlands with tall emergent vegetation.	No	
Great blue heron (*Ardea herodias*)		Riparian and aquatic habitats; usually nest in cottonwoods.	Yes (no nesting habitat)	X
Great egret (*Ardea alba*)		Transient; lakes, marshes, low gradient, slow flowing rivers.	No	
Snowy egret (*Egretta thula*)		Migrant; wetlands and flooded fields; low gradient, slow flowing rivers.	No	
Cattle egret (*Bubulcus ibis*)		Migrant; wide variety of aquatic and terrestrial habitats.	Yes	
Black-crowned night-heron (*Nycticorax nycticorax*)		Migrant; marshes, swamps or low gradient, wooded streams.	No	
White-faced Ibis (*Plegadis chihi*)		Wetlands with islands of emergent vegetation. Feeds in grasslands and marshes, flooded hay meadows and agricultural fields.	No	
Accipitriformes				
Turkey vulture (*Cathartes aura*)	R	Nests on cliffs or rock outcrops. Forages in grasslands, badlands, farmlands, open woodlands.	Yes (no nesting habitat)	
Osprey (*Pandion haliaetus*)	R	Lakes, reservoirs and rivers. Large, flat stable surface for nesting.	No	
Bald eagle (*Haliaeetus leucocephalus*)	DM, R	Nests in riparian forests surrounding lakes and rivers; forages in all habitats with suitable prey or carrion.	Yes (no nesting habitat)	X
Northern harrier (*Circus cyaneus*)	R	Nests on ground in grasslands and shrublands. Forages in a wide variety of habitats.	Yes	X, E
Sharp-shinned hawk (*Accipiter striatus*)	R	Even-aged coniferous and deciduous forests; sometimes hunts in open areas.	Yes	X

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Cooper's hawk (*Accipter cooperii*)	R	Dense coniferous and deciduous forests, often in draws or riparian areas.	Yes	
Northern goshawk (*Accipiter gentilis*)	R	Mature coniferous forests with limited undergrowth.	Yes	X
Swainson's hawk (*Buteo swainsoni*)	R	Nests in stream bottoms and brushy coulees, hunts in grasslands, agricultural land and riparian areas.	Yes (no nesting habitat)	E
Red-tailed hawk (*Buteo jamaicensis*)	R	Highly adaptable; nests in cliffs and trees, hunts in grasslands, open woodlands and agricultural fields.	Yes	X, E
Ferruginous hawk (*Buteo regalis*)	R	Shrub-grasslands, grasslands, sagebrush steppe.	Yes	X
Rough-legged hawk (*Buteo lagopus*)	R	Migrant/winter resident; sagebrush, grassland, agricultural land.	Yes	X
Golden eagle (*Aquila chrysaetos*)	R	Prairies, sagebrush/grassland and open woodlands; nests on cliffs or in large trees.	Yes	X
Falconiformes				
American kestrel (*Falco sparverius*)	R	Wide variety of habitats; nests in cavities of trees, banks, cliffs and buildings.	Yes	X, E, ASC
Merlin (*Falco columbarius*)	R	Riparian and coniferous stands adjacent to open habitats.	Yes	
Gyrfalcon (*Falco rusticolus*)	R	Migrant/winter resident; found near concentrations of waterfowl or upland gamebirds.	No	
Peregrine falcon (*Falco peregrinus*)	DM, R	Nests on cliffs with a wide view, near water and plentiful prey.	No	
Prairie falcon (*Falco mexicanus*)	R	Nests in cliffs near grasslands.	Yes (no nesting habitat)	
Gruiformes				
Virginia rail (*Rallus limicola*)	MG	Shallow wetlands with emergent vegetation.	Yes? (very limited)	
Sora (*Porzana carolina*)	MG	Marshes with grassy vegetation.	Yes? (very limited)	X
American coot (*Fulica americana*)	MG	Broad variety of wetlands; requires heavy stands of emergent vegetation and deeper standing water.	No	
Sandhill crane (*Grus canadensis*)	MG	Grasslands near marshes, ponds and streams.	Yes	X, ASC
Charadriiformes				
Black-bellied plover (*Pluvialis squatarola*)		Migrant; lakes and reservoirs, plowed fields, short meadows and pastures.	No	
American golden-plover (*Pluvialis dominica*)		Migrant igrant; lakes and reservoirs, plowed fields, short meadows and pastures.	No	
Semipalmated plover (*Charadrius semipalmatus*)		Migrant; open, sandy or gravelly areas along rivers and lakes.	No	
Piping plover (*Charadrius melodus*)		Migrant; open, sandy or gravelly areas along rivers and lakes.	No	
Killdeer (*Charadrius vociferous*)		Open areas such as sandbars, pastures and human-modified habitats.	Yes	X, ASC
Mountain plover (*Charadrius montanus*)		Prairie dog colonies; very short grassland	No	
Black-necked stilt (*Himantopus mexicanus*)		Migrant; medium to large wetland complexes.	No	
American avocet (*Recurvirostra americana*)		Marshes, ponds, mudflats and alkaline lakes.	No	
Spotted sandpiper (*Actitis macularius*)		Rocky shores of ponds and streams.	Yes? (limited)	
Solitary sandpiper (*Tringa solitaria*)		Migrant; sloughs and mudflats.	No	
Greater yellowlegs (*Tringa melanoleuca*)		Migrant; marsh edges, slow moving rivers and mudflats.	No	
Willet (*Tringa semipalmata*)		Sparse cover in wetlands and wet grasslands.	Yes? (very limited)	
Lesser yellowlegs (*Tringa flavipes*)		Migrant; mudflats, shallow ponds, flooded fields.	No	
Upland sandpiper (*Bartramia longicauda*)		Upland grasslands.	Yes	
Whimbrel (*Numenius phaeopus*)		Migrant; grassy wetlands.	Yes? (very limited)	
Long-billed curlew (*Numenius americanus*)		Dry grasslands.	Yes	
Marbled godwit (*Limosa fedoa*)		Grasslands associated with shallow wetlands.	Yes	
Ruddy turnstone (*Arenaria interpres*)		Migrant; stubble fields, sand shorelines of lakes and reservoirs.	No	
Red knot (*Calidris canutus*)	LT	Migrant; marshes, flooded fields.	No	
Sanderling (*Calidris alba*)		Migrant; larger lakes with windswept beaches.	No	
Semipalmated sandpiper (*Calidris pusilla*)		Migrant; wet and dry mudflats.	No	
Western sandpiper (*Calidris mauri*)		Migrant; wet and dry mudflats.	No	
Least sandpiper (*Calidris minutilla*)		Migrant; wet and dry mudflats.	No	
Baird's sandpiper (*Calidris bairdii*)		Migrant; wet meadows and shallow ponds.	No	
Pectoral sandpiper (*Calidris melanotos*)		Migrant; grassy prairie marshes and potholes.	No	
Dunlin (*Calidris alpina*)		Migrant; mudflats and sandy beaches.	No	
Stilt sandpiper (*Calidris himantopus*)		Migrant; shallow ponds with muddy bottoms.	No	
Buff-breasted sandpiper (*Calidris subruficollis*)		Migrant; short grass plains, dry uplands, human-altered habitats.	Yes	
Short-billed dowitcher (*Limnodramus griseus*)		Migrant; grassy marshes.	No	
Long-billed dowitcher (*Limnodromus scolopaceus*)		Migrant; grassy marshes.	No	

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Wilson's snipe (*Gallinago delicata*)	MG	Creek bottoms, marshes, wet fields and wetlands with ample cover.	Yes	X, ASC
Wilson's phalarope (*Phalaropus tricolor*)		Marshy borders of lakes and ponds; flooded fields.	Yes? (very limited)	X
Red-necked phalarope (*Phalaropus lobatus*)		Migrant; lakes, less commonly ponds.	No	
Sabine's gull (*Xema sabini*)		Migrant; usually large lakes and reservoirs.	No	
Bonaparte's gull (*Chroicocephalus philadelphia*)		Migrant; larger lakes, ponds.	No	
Franklin's gull (*Leucophaeus pipixcan*)		Migrant through study area; relatively large prairie marshes with emergent vegetation.	No	
Mew gull (*Larus canas*)		Migrant; large lakes and reservoirs.	No	
Ring-billed gull (*Larus delawarensis*)		Lakes, wetlands and human-modified habitats, including inland.	Yes? (no nesting habitat)	
California gull (*Larus californicus*)		Large lakes, ponds and rivers.	No	
Herring gull (*Larus argentatus*)		Migrant; islands and areas near water.	No	
Thayer's gull (*Larus thayeri*)		Migrant; large lakes, reservoirs and rivers.	No	
Glaucous gull (*Larus hyperboreus*)		Migrant; large lakes and reservoirs.	No	
Caspian tern (*Hydroprogne caspia*)		Migrant through study area; large lakes and reservoirs.	No	
Black tern (*Chlidonias niger*)		Wetlands, ponds, prairie potholes and reservoirs with emergent vegetation; nests on islands.	No	
Common tern (*Sterna hirundo*)		Islands of large lakes and reservoirs.	No	
Forster's tern (*Sterna forsteri*)		Large marshes with reed beds and muskrat houses.	No	
Columbiformes				
Rock pigeon (*Columba livia*)		Variety of habitats, often human-modified.	Yes? (very limited)	X, E
Band-tailed pigeon (*Petageoenas fasciata*)		Montane and mixed-species forests.	Yes? (may be on range periphery)	
Eurasian collared-dove (*Stretopelia decaocto*)		Non-native; open woodlands and human-modified habitats.	No	
Mourning dove (*Zenaida macroura*)	MG	Very adaptable; open woodlands, forest edges and human-modified habitats.	Yes	E
Cuculiformes				
Yellow-billed cuckoo (*Coccyzus americanus*)	LT	Riparian woodland with dense shrubby understory.	No	
Black-billed cuckoo (*Coccyzus erythropthalmus)*		Riparian woodland with dense shrubby understory.	No	
Strigiformes				
Barn owl (*Tyto alba*)	R	Grassland, shrub-steppe, marshes, pastures, croplands, hay fields.	Yes? (may be on range periphery)	
Western screech-owl (*Megascops kennicottii*)	R	Cottonwood bottoms and fringe of coniferous forests.	Yes? (may be on range periphery)	
Great horned owl (*Bubo virginianus*)	R	Highly adaptable; variety of habitats.	Yes	X, ASC
Snowy owl (*Bubo scandiacus*)	R	Migrant/winter resident; open fields and marshes.	Yes	
Northern hawk owl (*Surnia ulula*)	R	Migrant/winter resident; moderately dense coniferous or mixed forests, post-fire habitat.	Yes	
Northern pygmy-owl (*Glaucidium gnoma*)	R	River bottoms to timber line, often in mixed forests.	Yes	
Burrowing owl (*Athene cunicularia*)	R	Grasslands with abandoned mammal burrows	Yes	
Barred owl (*Strix varia*)	R	Large, unfragmented blocks of mature and old growth forest.	No? (may also be on range periphery)	
Great gray owl (*Strix nebulosa*)	R	Dense coniferous and hardwood forest.	Yes	X
Long-eared owl (*Asio otus*)	R	Woody draws, juniper thickets and forest edges.	Yes	
Short-eared owl (*Asio flammeus*)	R	Grasslands, plains and agricultural areas.	Yes	
Boreal owl (*Aegolius funereus*)	R	High-elevation mature spruce/fir forest with lodgepole pine.	No	
Northern saw-whet owl (*Aegolius acadicus*)	R	Coniferous forests, deciduous riparian areas.	Yes	
Caprimulgiformes				
Common nighthawk (*Chordeiles minor*)		Prairies, river valleys, marshes, farmlands.	Yes	X
Common poorwill (*Phalaenoptilus nuttallii*)		Grasslands, shrublands, rocky foothills.	Yes	
Apodiformes				
White-throated swift (*Aeronautes saxatalis*)		Wide variety of habitats; nests in cliffs and canyons.	Yes (no nesting habitat)	
Calliope hummingbird (*Selasphorus calliope*)		Montane environments, thicket hillsides and forest openings.	Yes	
Rufous hummingbird (*Selasphorus rufus*)		Generally cool environments, second growth and mature forests.	Yes	X
Coraciiformes				
Belted kingfisher (*Megaceryle alcyon*)		Waterbodies with nesting habitat in earthen banks.	No (no nesting habitat	X
Piciformes				

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Lewis's woodpecker (*Melanerpes lewis*)		River bottoms, mature ponderosa pine, forest edges, burned areas.	No	
Williamson's sapsucker (*Sphyrapicus thyroideus*)		Mid to high elevation montane and subalpine coniferous forest, usually in mature to old growth forest.	No	
Red-naped sapsucker (*Sphyrapicus nuchalis*)		Deciduous and mixed woodlands, including aspen.	Yes	X, ASC
Downy woodpecker (*Picoides pubescens*)		Deciduous and coniferous woodlands.	Yes	X
Hairy woodpecker (*Picoides villosus*)		Mature woodlands.	Yes	X
American three-toed woodpecker (*Picoides dorsalis*)		Coniferous forest with spruce, fir or larch.	Yes (limited)	X
Black-backed woodpecker (*Picoides arcticus*)		Early successional burned coniferous forest.	No	
Northern flicker (*Colaptes auratus*)		Open woodlands.	Yes	X, E, ASC
Pileated woodpecker *(Dryocopus pileatus)*		Late successional deciduous or coniferous forest; younger forest with large trees.	Yes? (very limited)	
Passeriformes				
Olive-sided flycatcher (*Contopus cooperi*)		Highly adapted to post-fire forest, forest openings, open forest, forest edges near wetlands.	Yes (limited)	
Western wood-pewee (*Contopus sordidulus*)		Deciduous and coniferous forest edges.	Yes	X
Willow flycatcher (*Empidonax traillii*)		Moist shrubby areas; brushy wetlands.	Yes (limited)	X
Least flycatcher (*Empidonax minimus*)		Diverse habitats from coniferous forest to shrub fields.	Yes	
Hammond's flycatcher (*Empidonax hammondii*)		Cool, dense mature coniferous or mixed forests.	Yes (limited)	
Dusky flycatcher (*Empidonax oberholseri*)		Brushy habitats, logged slopes, open coniferous forests, aspen groves.	Yes	X, ASC
Cordilleran flycatcher (*Empidonax occidentalis*)		Cool, shady areas along water courses.	Yes? (very limited)	
Say's phoebe (*Sayornis saya*)		Open habitat, sagebrush, badlands, and barren foothills.	Yes	
Western kingbird (*Tyrannus verticalis*)		Open habitats, prairies, and farmland.	Yes	
Eastern kingbird (*Tyrannus tyrannus*)		Open areas along forest edges and fields.	Yes	E
Loggerhead shrike (*Lanius ludovicianus*)		Willows, sagebrush, bitterbrush, greasewood.	Yes	
Northern shrike (*Lanius excubitor*)		Migrant/winter resident; forest edges, shrubs.	Yes	
Plumbeous vireo (*Vireo plumbeus*)		Warm, dry pine forests.	No (may be on range periphery)	
Cassin's vireo (*Vireo cassinii*)		Dry, open coniferous, mixed and deciduous forest.	Yes	
Warbling vireo (*Vireo gilvus*)		Large deciduous trees with semi-open canopy, especially along streams, ponds, marshes and lakes.	No	
Red-eyed Vireo (*Vireo olivaceus*)		Deciduous or mixed forests with limited understory.	Yes? (near upper elevation limit)	
Gray jay (*Perisoreus canadensis*)		Boreal and subalpine coniferous forests	Yes	
Pinyon jay (*Gymnorhinus cyanocephalus*)		Ponderosa and limber pine.	No	
Steller's jay (*Cyanocitta stelleri*)		Coniferous and mixed forests, open woodlands, orchards.	Yes	
Blue jay (*Cyanocitta cristata*)		Coniferous/deciduous trees, particularly in towns.	No	
Clark's nutcracker (*Nucifraga columbiana*)		Coniferous forests.	Yes	X, E
Black-billed magpie (*Pica hudsonia*)		Thickets, particularly near water and/or human activity.	Yes	X, E
American crow (*Corvus brachyrhynchos*)		Highly adaptable; wide variety of habitats.	Yes	X, ASC
Common raven (*Corvus corax*)		Highly adaptable; wide variety of habitats.	Yes	X, E, ASC
Horned lark (*Eremophila alpestris*)		Open, barren habitat; shortgrass prairie.	Yes	
Purple martin (*Progne subis*)		Migrant, usually at lower elevations; open woodlands, human areas	Yes? (near upper elevation limit)	
Tree swallow (*Tachycineta bicolor*)		Open fields, meadows, marshes, wetland fringes. Nests in tree cavities or nest boxes.	Yes	X, E, ASC
Violet-green swallow (*Tachycineta thalassina*)		Deciduous, coniferous and mixed forests.	Yes	
Northern rough-winged swallow (*Stelgidopteryx serripennis*)		Nests in cliffs, sandbanks and crevices. Forages over water.	Yes? (limited)	
Bank swallow (*Riparia riparia*)		Low elevation habitats with eroded banks for nesting.	No? (near upper elevation limit)	
Cliff swallow (*Petrochelidon pyrrhonota*)		Sites with overhangs (rock or structure) near mud source.	Yes	
Barn swallow (*Hirundo rustica*)		Under roofs or eves with nearby water.	Yes (very limited)	X, E
Black-capped chickadee (*Poecile atricapillus*)		Open woodlands, thickets.	Yes	
Mountain chickadee (*Poecile gambeli*)		Montane coniferous forests; mixed deciduous/coniferous forest.	Yes	X, ASC
Red-breasted nuthatch (*Sitta canadensis*)		Coniferous and mixed forest edges.	Yes	X
White-breasted nuthatch (*Sitta carolinensis*)		Coniferous and mixed forest edges.	Yes	
Pygmy nuthatch (*Sitta pygmae*)		Mature ponderosa pine forests with mature trees, little affected by logging or snag removal	No	
Brown creeper (*Certhia americana*)		Mature coniferous and mixed forests with large trees and snags.	Yes? (limited)	
Rock wren (*Salpinctes obsoletus*)		Rocky outcrops, crevices.	Yes (limited)	
Canyon wren (*Catherpes mexicanus*)		Limited to rocky cliffs, canyons, usually in arid areas.	No	

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
House wren (*Troglodytes aedon*)		Inhabits woodlands and human-modified landscapes.	Yes	ASC
Pacific wren I*Troglodytes pacificus*)		Riparian areas within large, uncut stands mature and old growth spruce/fir forest	No	
Marsh wren (*Cistothorus palustris*)		Marshes with dense emergent vegetation and relatively deep water.	No	
American dipper (*Cinclus americanus*)		Fast moving, clear streams; waterfalls	No	
Golden-crowned kinglet (*Regulus satrapa*)		Forests with closed or open canopies; edges of clearings; near water	Yes	
Ruby-crowned kinglet (*Regulus calendula*)		Coniferous and deciduous forests, floodplain forests, willows.	Yes	X, ASC
Western bluebird (*Sialia mexicana*)		Open coniferous and deciduous forests.	Yes? (may be on range periphery)	
Mountain bluebird (*Sialia currucoides*)		Open areas with scattered trees.	Yes	X, ASC
Townsend's solitaire (*Myadestes townsendi*)		Open coniferous forests.	Yes	X, ASC
Veery (*Catharus fuscescens*)		Riparian forests with dense understory; willows.	No	
Swainson's thrush (*Catharus ustulatus*)		Mature coniferous, deciduous riparian and aspen forests.	Yes	
Hermit thrush (*Catharus guttatus*)		Interior forest, edges.	Yes	
American robin (*Turdus migratorius*)		Diverse woodland habitats.	Yes	X, E, ASC
Varied thrush (*Ixoreus naevius*)		Humid interior montane forest; deciduous forest with thick understory.	Yes? (limited)	
Gray catbird (*Dumetella carolinensis*)		Dense shrubs, early successional forest, abandoned buildings, tree rows. Uncommon in areas dominated by confirs.	Yes? (very limited)	
Northern mockingbird (*Mimus polyglottos*)		Low elevation forest edges, urban, cultivated lands.	No	
Sage thrasher (*Oreoscoptes montanus*)		Dense sagebrush.	Yes	
Brown thrasher (*Toxosyoma rufum*)		Thickets, shrubby draws.	No (also may be on range periphery)	
European starling (*Sturnus vulgaris*)		Wide variety of habitats at lower elevations.	Yes	X, ASC
American pipit (*Anthus rubescens*)		Nests at or above timberline in sparsely vegetated, open habitat; during migration, found at low elevations.	No	
Sprague's pipit (*Anthus spragueii*)	C	Large areas of native, medium to intermediate height prairie at lower elevations.	No (near upper elevation limit)	
Bohemian waxwing (*Bombycilla garrulous*)		Migrant/winter resident; open coniferous and mixed forests.	Yes	
Cedar waxwing (*Bombycilla cedrorum*)		Open forests, riparian areas, human-made habitats..	Yes	
Lapland longspur (*Calcarius lapponicus*)		Migrant/winter resident; open areas, grasslands, usually at lower elevations	No (near upper elevation limit)	
Chestnut-collared longspur (*Calcarius ornatus*)		Heavily grazed or mowed grasslands, pastures.	No (also may be on range periphery)	
McCown's longspur (*Rhynchophanes mccownii*)		Shortgrass prairie, bare ground	No (also may be on range periphery)	
Snow bunting (*Plectrophenax nivalis*)		Migrant/winter resident; open grasslands and fields, roadsides, stubble.	Yes	
Ovenbird (*Seiurus aurocapillus*)		Mature deciduous or deciduous/coniferous forests, generally below 5500 feet elevation.	Yes? (limited) (near upper elevation limit)	
Northern waterthrush (*Parkesia noveboracensis*)		Cool, dark wooded swamps, bog thickets, willows and alders along rivers.	Yes? (very limited)	
Tennessee warbler (*Oreothlypis peregrina*)		Migrant; open woodlands.	Yes	
Orange-crowned warbler (*Oreothlypis celata*)		Aspen, riparian forests with low shrubs.	Yes	
Nashville warbler (*Oreothlypis ruficapilla*)		Open deciduous and coniferous forest; edges.	Yes	
MacGillivray's warbler (*Geothlypis tolmiei*)		Riparian habitat and clearcuts in conifer forests; dense second growth.	Yes	X
Common yellowthroat (*Geothlypis trichas*)		Dense shrubby vegetation.	Yes? (limited)	ASC
American redstart (*Setophaaa ruticilla*)		Shrubby deciduous woodlands near water; willows.	Yes? (very limited)	
Magnolia warbler (*Setophaga magnolia*)		Migrant; coniferous forests and brushy areas.	Yes	
Yellow warbler (*Setophaga petechia*)		Wet or mesic brushy habitat.	Yes	ASC
Blackpoll warbler (*Setophaga striata*)		Migrant; alder, spruce or willow thickets	Yes? (very limited)	
Chestnut-sided warbler (*Setophaga pensylvanica*)		Migrant; variety of shrubby habitats and open woodlands.	Yes	
Palm warbler (*Setophaga palmarum*)		Migrant igrant; open areas in various woodlands at low elevations.	No (near upper elevation limit)	
Yellow-rumped warbler (*Setophaga coronata*)[7]		Mature coniferous and mixed forests.	Yes	E, ASC
Townsend's warbler (*Setophaga townsendi*)		Migrant through study area; tall coniferous and mixed coniferous-deciduous forests; prefers old growth or late successional forests.	Yes? (limited)	

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Wilson's warbler (*Cardellina pusilla*)		Riparian habitat with willows; dense mesic shrubs.	Yes	X
Yellow-breasted chat (*Icteria virens*)		Low, dense shrubs, without a tree canopy., at lower elevations.	No (near upper elevation limit)	
Green-tailed towhee (*Pipilo chlorurus*)		Edges of thick, shrubby habitats, usually shrub—steppe habitats.	Yes? (very limited)	
Spotted towhee (*Pipilo maculatus*)		Tall shrubs, open forest, usually at lower elevations.	No (near upper elevation limit)	ASC
American tree sparrow (*Spizella arborea*)		Migrant/winter resident; open areas with scattered trees, human-modified landscapes. At lower elevations	No	
Chipping sparrow (*Spizella passerina*)		Open woodlands, particularly coniferous.	Yes	X, ASC
Clay-colored sparrow (*Spizella pallida*)		Second-growth areas, open shrublands at lower elevations.	No	
Brewer's sparrow (*Spizella breweri*)		Sagebrush.	Yes	ASC
Vesper sparrow (*Pooecetes gramineus*)		Grasslands and sagebrush.	Yes	X, ASC
Lark sparrow (*Chondestes grammacus*)		Widespread in open habitats, usually below 5500 feet elevation.	Yes? (near upper elevation limit)	E
Sagebrush sparrow (*Artemisiospiza nevadensis*)		Large areas of contiguous big sagebrush.	Yes? (may be on range periphery)	
Lark bunting (*Calamospiza melanocorys*)		Shortgrass and mixed-grass habitats,	Yes	
Savannah sparrow (*Passerculus sandwichensis*)		Open meadows, marshes, agricultural fields.	Yes	X, E, ASC
Grasshopper sparrow (*Ammodramus savannarum*)		Open prairie with intermittent brush at lower elevations.	No (near upper elevation limit)	
Baird's sparrow (*Ammodramus bairdii*)		Native prairie, tame pasture with no or little grazing, usually at lower elevations.	Yes (may be on range periphery)	X
Fox sparrow (*Passerella iliaca*)		Thick cover, forest edges.	Yes	
Song sparrow (*Melospiza melodia*)		Wide habitat range, often near water.	Yes	X, ASC
Lincoln's sparrow (*Melozpiza lincolnii*)		Boggy shrubs, willows, sedges, mossy areas; aspen, cottonwoods.	Yes? (limited)	ASC
Swamp sparrow (*Melospiza georgiana*)		Migrant; wetlands, forest edges, dense brush.	Yes? (limited)	
White-throated sparrow (*Zonotrichia albicollis*)		Migrant; brushy habitats near or within woodlands, usually at lower elevations.	Yes? (limited) (near upper elevation limit)	
Harris' sparrow (*Zonotrichia querula*)		Migrant; deciduous shrubs and trees, often along streams at lower elevations.	No (near upper elevation limit)	
White-crowned sparrow (*Zonotrichia leucophrys*)		Grasslands; bare ground for forage, dense cover for nesting; surface water; tall conifers.	Yes	X, ASC
Dark-eyed junco (*Junco hyemalis*)[8]		Open coniferous forests, parks, farms, rural roadsides and stream edges.	Yes	X
Western tanager (*Piranga ludoviciana*)		Open woodlands.	Yes	
Rose-breasted grosbeak (*Pheucticus ludovicianus*)		Migrant; deciduous forests at lower elevations.	No (near upper elevation limit)	
Black-headed grosbeak (*Pheucticus melanocephalus*)		Diverse forested habitats, including riparian.	Yes	
Lazuli bunting (*Passerina amoena*)		Mesic shrublands; forest openings.	Yes? (limited)	
Indigo bunting (*Passerina cyanea*)		Migrant; shrubby and weedy habitats at lower elevations.	No	
Bobolink (*Dolichonyx oryzivorus*)		Tall and mixed grass prairies; old fields, usually below 5500 feet elevation.	Yes? (very limited) (near upper elevation limit)	X
Red-winged blackbird (*Agelaius phoeniceus*)		Variety of wetland and upland habitats.	Yes	X, E
Western meadowlark (*Sturnella neglecta*)		Native grasslands, shrublands, pastures, hay, alfalfa.	Yes	X, ASC
Yellow-headed blackbird (Xanthocephalus xanthocephalus)		Wetlands with emergent vegetation, usually below 5500 feet elevation.	Yes? (very limited) (near upper elevation limit)	
Rusty blackbird (*Euphagus carolinus*)		Migrant; moist woodlands (primarily coniferous), wooded edges of water courses, usually below 5500 feet elevation.	Yes? (very limited) (near upper elevation limit)	
Brewer's blackbird (*Euphagus cyanocephalus*)		Open, often human-modified habitats.	Yes	ASC
Common grackle (*Quiscalus quiscula*)		Open woodland and edges, marshes, human-altered landscapes, usually below 5500 feet elevation.	Yes? (limited) (near upper elevation limit)	
Brown-headed cowbird (*Molothrus ater*)		Prairie, agricultural fields, forest edges, pastures.	Yes	X, ASC
Bullock's oriole (*Icterus bullockii*)		Open deciduous woodlands, especially riparian, usually below 5500 feet elevation.	No (near upper elevation limit)	
Baltimore oriole (*Icterus galbula*)		Open woodlands, woodland margins, urban parks at lower elevations.	No	

Appendix A (continued).

Species	Legal Status[1]	Preferred and/or Breeding Habitat	Preferred and/or breeding habitat in the Project area	Recorded in or near the Project area[2]
Gray-crowned rosy-finch (*Leucosticte tephrocotis*)[9]		Nests in crevices above timberline; in winter, open fields	Yes (no nesting habitat)	
Black rosy-finch (*Leucosticte atrata*)		Nests above timber line; in winter, open fields.	Yes (no nesting habitat)	
Pine grosbeak (*Pinicola enucleator*)		Open coniferous forest.	Yes	
Purple finch (*Haemorhous purpureus*)		Migrant; coniferous and deciduous forests, usually below 5500 feet elevation.	Yes? (limited) (near upper elevation limit)	
Cassin's finch (*Haemorhous cassinii*)		Most forest types (including riparian), particularly ponderosa pine.	Yes	ASC
House finch (*Haemorhous mexicanus*)		Open, semi-open and human-modified habitats, usually below 5500 feet elevation.	Yes? (limited) (near upper elevation limit)	
Red crossbill (*Loxia curvirostra*)		Mature coniferous forests.	Yes	
White-winged crossbill (*Loxia leucoptera*)		Mature coniferous and mixed forests.	Yes	
Common redpoll (*Acanthis flammea*)		Migrant/winter resident; open woodlands, scrub, field edges, towns, usually below 5500 feet elevation.	Yes? (limited) (near upper elevation limit)	
Hoary redpoll (*Acanthis hornemanni*)		Migrant/winter resident; open woodlands, scrub, towns, usually below 5500 feet elevation.	Yes? (limited) (near upper elevation limit)	
Pine siskin (*Spinus pinus*)		Open coniferous and deciduous forests.	Yes	X, ASC
American goldfinch (*Spinus tristis*)		Weedy fields, flood plains, human-altered land.	Yes (limited)	X, E
Evening grosbeak (*Coccothraustes vespertinus*)		Mixed conifer, spruce-fir and deciduous forests.	Yes	
House sparrow (*Passer domesticus*)		Human-modified habitats, usually below 5500 feet elevation.	Yes? (very limited) (near upper elevation limit)	

[1]FWS (2015): LT = Listed Threatened; LE = Listed Endangered; C = Candidate; CH = designated Critical Habitat; DM = Delisted, Monitored. FWP (various): FB = Fur-Bearing mammal; NM = Nongame in need of Management; PM = Predatory Mammal; MG = Migratory Game bird; R = Raptor; UG = Upland Game bird

[2] X=species recorded during 2014-2015 evaluation. E = species recorded by Elliott (2011). ASC = species recorded by ASC (1994-2004).

[3]Distribution and nomenclature from MTNHP (2015a).

[4]Species in bold text are Montana Species of Concern, Potential Species of Concern or Special Status Species (MTNHP 2015; MTNHP and FWP 2015).

[5]? = Habitat availability uncertain. May be on range periphery = species' Montana range limit is near the study area. May be near upper elevation limit = most Montana records are from elevations lower than the study area. No preferred roosting habitat = species' preferred roosting habitat is not available in the study area. Limited = preferred habitat in study area, if available, is limited in extent. Very limited = preferred habitat in study area, if available, is very limited in extent. Noo nesting habitat = foraging habitat may be available in the study area, but nesting habitat is not available. Could occur as transient = although preferred habitat may be available in the study area, species is likely to occur only as a transient through the area. Migrant = species migrates through Montana. If preferred habitat is available in the study area, use of the study area would likely be short-term. Migrant/winter resident = species migrates through Montana and may be present in winter in the study area. Migrant through study area = species may nest in Montana but would only migrate through the study area.

[6] Distribution and nomenclature from MTNHP (2015a) and Montana Bird Distribution Committee (2012).

[7]Includes Audubon's warbler (*Setophaga coronata auduboni*) and myrtle warbler (*Setophaga coronata coronata*).

[8]Includes Oregon (Montana) junco (*Junco hyemalis montanus*), pink-sided junco (*Junco hyemalis mearnsi*) and slate-colored junco (*Junco hyemalis hyemalis/cismontanus*).

[9]Includes Cassin's gray-crowned rosy-finch (*Leucosticte tephrocotis tephrocotis*) and Hydson's gray-crowned rosy-finch (*Leucosticte tephrocotis littoralis*).

APPENDIX B. WILDLIFE HABITAT DESCRIPTIONS, BLACK BUTTE COPPER PROJECT STUDY AREA.

Six major wildlife habitat types comprising 15 habitat subtypes were identified in the Black Butte Copper project terrestrial wildlife resources evaluation area. Habitats were mapped as a single habitat subtype, or were grouped into combinations of subtypes when it they were present as mosaics.

Habitat Type 000. Miscellaneous Features

Habitat Subtype 001. Rock Outcrop

Habitat subtype 001 comprised small exposed outcrops on ridge tops, primarily in the west portion of the study area. Most were too small to be mapped at the scale (1" = 1000') used for the habitat map; therefore some outcrops were encompassed within the map unit for the surrounding habitat (Plate 1). Consequently the acreage of rock outcrops (Table 1) may have been underestimated. These rock outcrops were used as perches by raptors and passerine birds, den sites for yellow-bellied marmots, and may have provided roost sites for bats.

There were larger, more vertical rock outcrops on Black Butte, just outside the study area. These outcrops were partially vegetated with Douglas-fir (*Pseudotsuga menziesii*) and did not present suitable cliff nesting sites for raptors.

Habitat Subtype 002. Pond/Impoundment/Stream

Three water body types were mapped as subtype 002:

- There were very small ponds formed by snow and rain runoff in natural depressions, usually on ridges. These were often too small to be mapped at the scale used for the habitat map. Most held water only for very short periods of time, but provided water sources for pronghorn, mule deer, elk, killdeer and several passerine bird species.

- A small, man-made impoundment created when gravel was excavated from the floodplain of Little Sheep Creek. Several species of waterfowl (*e.g.*, Canada geese, mallard, gadwall, green-winged teal), shorebirds (*e.g.*, killdeer, Wilson's snipe, Wilson's phalarope) and passerine birds (*e.g.*, red-winged blackbird, American robin) were recorded at this site.

- Perennial streams, including Sheep Creek and Little Sheep Creek. Great blue herons, mallards, and Wilson's snipe were recorded in these streams.

Habitat Subtype 020. Road

For the purposes of this study, road habitat was comprised of permanent, all-season roads. Professional judgment was used to classify a wildlife sighting as associated with either roads (i.e., the animal(s) were actually using the habitat created by the road surface) or with the adjoining habitat (e.g., a deer crossing

a road). Sightings associated with barrow pits (e.g., a western meadowlark foraging in a barrow pit) were assigned to grassland habitat subtype 411 (bunchgrass).

Habitat Subtype 021. Buildings

Building sites consisted of occupied and unoccupied residences and/or outbuildings. Most of the wildlife species recorded at building sites (Appendix C) were passerine birds that could be considered adaptable to and/or tolerant of human activities.

Habitat Type 100. Woodland

Habitat Subtype 105. Aspen

Aspen groves were distributed irregularly in the study area, usually at sites near surface moisture such as seeps, springs or small perennial or intermittent streams. There were several small aspen groves that could be mapped at the scale of the habitat map. These stands were used by mule deer, black bear and a variety of passerine birds.

Habitat Subtype 105/160. Aspen/Douglas-fir

Some of the forested stands in the study area were decadent aspen groves that were co-dominated by Douglas-fir. Wildlife use was similar to both aspen (subtype 105) and Douglas-fir (subtype 160).

Habitat Subtype 114. Willow

Several willow species were present along Sheep Creek, Little Sheep Creek, and other drainages in the study area. Common gartersnakes, unidentified bats, white-tailed deer and several bird species were recorded in willow habitats.

Habitat Subtype 160. Douglas-fir

Habitat subtype 160, dominated by Douglas-fir, defined the conifer habitat in the study area. Habitat subtype 160 comprised Douglas-fir/rock, occurring in very small amounts in the study area but present in adjacent areas, including Black Butte; Douglas-fir/grass, usually found on dryer sites with a more open overstory, and herbaceous species such as pinegrass (*Calamagrostis rubescens*) and bluebunch wheatgrass (*Agropyron spicatum*) in the understory; and Douglas-fir/deciduous shrub, with an understory dominated by deciduous shrubs such as ninebark (*Physocarpus malvaceus*) and snowberry (*Symphoracarpos occidentalis*). These habitats formed a mosaic that could not be mapped separately at the scale (1" = 1000') used for the habitat map. Most wildlife sightings from one habitat were also recorded in the others, so they were grouped for mapping purposes.

Habitat Subtype 160/212. Douglas-fir/Sagebrush

Habitat subtype 160/212 occurred where Douglas-fir was encroaching into stands of sagebrush. Most wildlife species recorded in subtype 160 were also recorded in subtype 160/212, but the latter formed an ecotone with more open habitats, and accounted for sightings of some edge species.

Habitat Type 200. Xeric Shrubland

Habitat Subtype 212. Sagebrush

Sagebrush vegetation communities were grouped into a single wildlife habitat subtype. Habitat subtype 212 was a dominant habitat in open portions of the study area, particularly on flat topography and in drainages.

Habitat Subtype 212/411. Sagebrush/Bunchgrass

On more rolling topography, sagebrush stands formed a mosaic with openings dominated by bunchgrasses. These openings/stands could not be differentiated at the scale (1" = 1000') used for the habitat map. Most wildlife sightings from one habitat were also recorded in the other, so they were grouped for mapping purposes. Many species that would be considered "prairie" species (*e.g.*, pronghorn, Richardson's ground squirrel, western meadowlark, vesper sparrow) were recorded in these habitats.

Habitat Type 300. Mesophytic Shrub

Habitat Subtype 320. Low Mesophytic Shrub

Habitat subtype 320 was generally restricted to swales and drainage bottoms. Most mapped stands were dominated by shrubby cinquefoil (*Dasiphora fruticosa*), although other species (snowberry, sagebrush) were often present.

Habitat Type 400. Grassland

Grasslands formed the third (along with xerophytic shrubland and woodland) predominant habitat in the Black Butte Copper Project terrestrial wildlife resources evaluation area. Habitat type 400 comprised two subtypes: bunchgrass (subtype 411) and riparian grass (subtype 413).

Habitat subtype 411. Bunchgrass

For the purposes of the Black Butte Copper Project terrestrial wildlife resources evaluation, bunchgrass habitats were characterized by dominant native grasses that grow in discrete clumps rather than sod-like carpets. Bunchgrass habitat was primarily mapped on uplands, and formed a mosaic with sagebrush habitat. Consequently, many wildlife species recorded in one subtype were also observed in the other (Appendix C).

Habitat Subtype 413. Riparian Grass

Riparian grass was a diverse but restricted habitat subtype, occurring only in moist to wet drainages, and often found in association with subtypes 002 (water), 114 (willow) and 320 (low mesophytic shrub). The stands were often wet or subject to seasonal flooding.

Habitat Type 500. Agriculture

Habitat Subtype 510/530. Hay/Tame Pasture

For the purposes of the Black Butte Copper Project terrestrial wildlife resources evaluation, agricultural habitats were defined as those areas that appeared to have been cultivated and/or partially or entirely disturbed for pasture or hay production. Two subtypes (510 (hay) and 530 (tame pasture)) were combined for this habitat, and were found along the Sheep Creek bottom and lower ends of some tributaries. Most of the wildlife species recorded in association with these habitat subtypes were also recorded in stream bottom habitats (Appendix C).

Appendix C. Wildlife species recorded by habitat in the Black Butte Copper Project terrestrial wildlife resources evaluation, 2014-2015.

Species	Habitat Subtype												Total
	001 Rock	002 Water	020 Road	021 Bldg.	105 Aspen	114 Willow	160 Douglas-fir	212 Sagebrush	320 Low Mesic Shrub	411 Bunchgrass	413 Rip. Grass	510/530 Hay/Tame Pasture	
AMPHIBIANS													
None													**0**
REPTILES													
Squamata													
Common gartersnake (*Thamnophis sirtalis*)						X					X		**2**
MAMMALs													
Chiroptera													
Unidentified bat		X				X		X			X	X	**5**
Lagomorpha													
White-tailed jackrabbit (*Lepus townsendii*)							X	X					**2**
Mountain cottontail (*Sylvilagus nuttallii*)	X		X	X	X		X						**5**
Rodentia													
Beaver (*Castor canadensis*)		X											**1**
Porcupine (*Erethizon dorsatum*)							X						**1**
Northern pocket gopher (*Thomomys talpoides*)						X		X	X	X	X	X	**6**
Bushy-tailed woodrat (*Neotoma cinerea*)	X												**1**
Deer mouse (*Peromyscus maniculatus*)								X					**1**
Yellow-bellied marmot (*Marmota flaviventris*)	X									X			**2**
Red squirrel (*Tamiasciurus hudsonicus*)							X						**1**
Richardson's ground squirrel (*Urocitellus richardsonii*)	X		X	X				X	X	X	X	X	**8**
Yellow-pine chipmunk (*Tamias amoenus*)							X						**1**
Least chipmunk (*Tamias minimus*)					X		X						**2**
Carnivora													
Coyote (*Canis latrans*)	X	X	X		X		X	X	X	X	X	X	**10**
Bobcat (*Lynx rufus*)							X						**1**
Unidentified weasel (*Mustela* spp.)				X									**1**
Badger (*Taxidea taxus*)			X					X		X			**3**
Black bear (*Ursus americanus*)		X		X	X		X				X		**5**
Artiodactyla													
Pronghorn (*Antilocapra americana*)		X						X		X			**3**
Mule deer (*Odocoileus hemionus*)		X			X		X	X	X	X	X		**7**
Elk (*Cervus elaphus*)		X					X	X		X	X		**5**
White-tailed deer (*Odocoileus virginianus*)		X				X					X	X	**4**
BIRDS													
Anseriformes													
Canada goose (*Branta canadensis*)		X											**1**
Gadwall (*Anas strepera*)		X											**1**
Mallard (*Anas platyrhynchus*)		X											**1**
Green-winged teal (*Anas crecca*)		X											**1**
Galliformes													
Dusky grouse (*Dendragapus obscurus*)							X						**1**
Pelecaniformes													
Great blue heron (*Ardea herodias*)		X				X							**2**
Accipitriformes													
Bald eagle (*Haliaeetus leucocephalus*)												X	**1**
Northern harrier (*Circus cyaneus*)								X			X		**2**
Sharp-shinned hawk (*Accipiter striatus*)							X						**1**
Northern goshawk (*Accipiter gentilis*)							X	X					**2**
Red-tailed hawk (*Buteo jamaicensis*)							X	X					**2**

Appendix C (continued).

Species	Habitat Subtype												Total
	001 Rock	002 Water	020 Road	021 Bldg.	105 Aspen	114 Willow	160 Douglas-fir	212 Sagebrush	320 Low Mesic Shrub	411 Bunchgrass	413 Rip. Grass	510/530 Hay/Tame Pasture	
Ferruginous hawk (*Buteo regalis*)								X					**1**
Rough-legged hawk (*Buteo lagopus*)										X			**1**
Golden eagle (*Aquila chrysaetos*)							X	X					**2**
Falconiformes													
American kestrel (*Falco sparverius*)								X		X			**2**
Gruiformes													
Sora (*Porzana carolina*)		X									X		**2**
Sandhill crane (*Grus canadensis*)										X	X	X	**3**
Charadriiformes													
Killdeer (*Charadrius vociferus*)		X	X										**2**
Wilson's snipe (*Gallinago delicata*)		X				X		X			X	X	**5**
Wilson's phalarope (*Phalaropus tricolor*)		X											**1**
Columbiformes													
Rock pigeon (*Columba livia*)				X									**1**
Strigiformes													
Great horned owl (*Bubo virginianus*)						X							**1**
Great gray owl (*Strix nebulosa*)							X						**1**
Caprimulgiformes													
Common nighthawk (*Chordeiles minor*)								X		X		X	**3**
Apodiformes													
Rufous hummingbird (*Selasphorus rufus*)					X	X							**2**
Coraciiformes													
Belted kingfisher (*Megaceryle alcyon*)		X				X							**2**
Piciformes													
Red-naped sapsucker (*Sphyrapicus nuchalis*)							X						**1**
Downy woodpecker (*Picoides pubescens*)							X						**1**
Hairy woodpecker (*Picoides villosus*)							X						**1**
American three-toed woodpecker (*Picoides dorsalis*)							X						**1**
Northern flicker (*Colaptes auratus*)					X	X	X						**3**
Passeriformes													
Western wood-pewee (*Contopus sordidulus*)							X						**1**
Willow flycatcher (*Empidonax traillii*)					X	X							**2**
Dusky flycatcher (*Empidonax oberholseri*)					X		X						**2**
Clark's nutcracker (*Nucifraga columbiana*)							X						**1**
Black-billed magpie (*Pica hudsonia*)				X		X				X			**3**
American crow (*Corvus brachyrhynchos*)												X	**1**
Common raven (*Corvus corax*)			X			X	X	X		X			**5**
Tree swallow (*Tachycineta bicolor*)		X			X	X		X	X	X	X	X	**8**
Barn swallow (*Hirundo rustica*)				X									
Mountain chickadee (*Poecile gambeli*)							X						**1**
Red-breasted nuthatch (*Sitta canadensis*)							X						**1**
Ruby-crowned kinglet (*Regulus calendula*)							X						**1**
Mountain bluebird (*Sialia currucoides*)	X		X	X	X			X	X	X			**7**
Townsend's solitaire (*Myadestes townsendi*)							X						**1**
American robin (*Turdus migratorius*)			X	X	X	X	X	X		X		X	**8**
European starling (*Sturnus vulgaris*)				X				X					**2**
MacGillivray's warbler (*Geothlypis tolmiei*)							X						**1**
Wilson's warbler (*Cardellina pusilla*)						X							**1**
Chipping sparrow (*Spizella passerina*)							X	X					**2**
Vesper sparrow (*Pooecetes gramineus*)								X		X			**2**
Savannah sparrow (*Passerculus sandwichensis*)											X	X	**2**
Baird's sparrow (*Ammodramus bairdii*)								X		X			**2**

Appendix C (continued).

Species	Habitat Subtype												Total
	001 Rock	002 Water	020 Road	021 Bldg.	105 Aspen	114 Willow	160 Douglas-fir	212 Sagebrush	320 Low Mesic Shrub	411 Bunchgrass	413 Rip. Grass	510/530 Hay/Tame Pasture	
Song sparrow (*Melospiza melodia*)					X								**1**
White-crowned sparrow (*Zonotrichia leucophrys*)							X						**1**
Dark-eyed junco (*Junco hyemalis*)							X						**1**
Bobolink (*Dolichonyx oryzivorus*)												X	**1**
Red-winged blackbird (*Agelaius phoeniceus*)		X						X			X		**3**
Western meadowlark (*Sturnella neglecta*)	X		X	X				X		X		X	**6**
Brown-headed cowbird (*Molothrus ater*)							X	X		X			**3**
Pine siskin (*Spinus pinus*)							X						**1**
American goldfinch (*Spinus tristis*)			X	X									**2**
Total	**7**	**20**	**10**	**12**	**13**	**16**	**37**	**29**	**6**	**21**	**16**	**15**	

LEGEND

- Project Boundary
- Fence
- Habitat Type Boundary

Map Symbol	Habitat Type
001	Rock outcrop
002	Water
020	Road
021	Building
105	Aspen
114	Willow
160	Douglas-fir
212	Sagebrush
320	Low mesic shrub
411	Bunchgrass
413	Riparian grass
510/530	Hay / tame pasture

Aerial: 2013 NAIP
Topo: 20' Generated from ⅓ second NED

N

Scale 1" = 1000'

0 500 1000 2000

Feet

TINTINA RESOURCES

Black Butte Copper Project

Wildlife Habitat

WESTECH ENVIRONMENTAL SERVICES
406-442-0950 | P.O. Box 6045 | Helena, MT 59604

Sheet 1 of 1

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