Biological Resources Overview
for
Park City Heights

Prepared for

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Table of Contents

List of Figures

List of Tables

List of Appendixes

1. Background

The Boyer Company has proposed a residential development for a parcel of land along Richardson Flat Road, called Park City Heights. The Boyer Company requested that Logan Simpson Design Inc. (LSD) visit the Park City Heights project area and evaluate biological resources present in the area. This includes identifying any protected or sensitive biological resources that may occur in the project area or could be affected by the proposed development; documenting the ecological setting of the project area; providing a qualitative assessment of wildlife habitats within the area; identifying the common plant and animal species occupying the property; identifying and determining the suitability of habitats within the project area for endangered, threatened, or special concern plants and animals known from Summit County, Utah; providing an evaluation of the suitability of habitat for greater sage-grouse, which has been documented near the project area; and providing a review of the Park City Sensitive Lands Overlay (SLO) Zoning Regulations.

Throughout this Biological Resources Overview, the term “project site” is used to represent the development footprint (area of disturbance); the term “developable property” is a 216 acre contiguous parcel of land within which the project site is located; and the term “project area” includes lands generally surrounding the developable property. The term “project vicinity” is used to denote a more expansive landscape context. Note, a non-contiguous parcel of approximately 23 acres will be included in the zoning permit request; however this land was not considered in this biological study because it will not to be developed.

2. Project Location

The developable property is an approximately 216-acre parcel located south of Utah State Route (SR) 248 and west of US Highway 40 (US 40) in Park City, Summit County, Utah (Figures 1 and 2). The property lies adjacent to, but outside the city limits of Park City. Approximately one third of the property is proposed for development – a site plan is included in Appendix A. The proposed development is at the base of the mountains, east to US 40, and north to nearly Richardson Flat Road. Lands adjacent to the property are a combination of mountain slopes with undeveloped shrublands in conservation easements (to the west), residential developments (to the west and southwest), riparian corridors and agricultural land (to the north) and an embankment for a controlled access highway (to the east). The developable property’s legal description includes portions of the southern half of section 2 and the northern half of section 11, Township 2 South, Range 4 East (Salt Lake Baseline and Meridian).

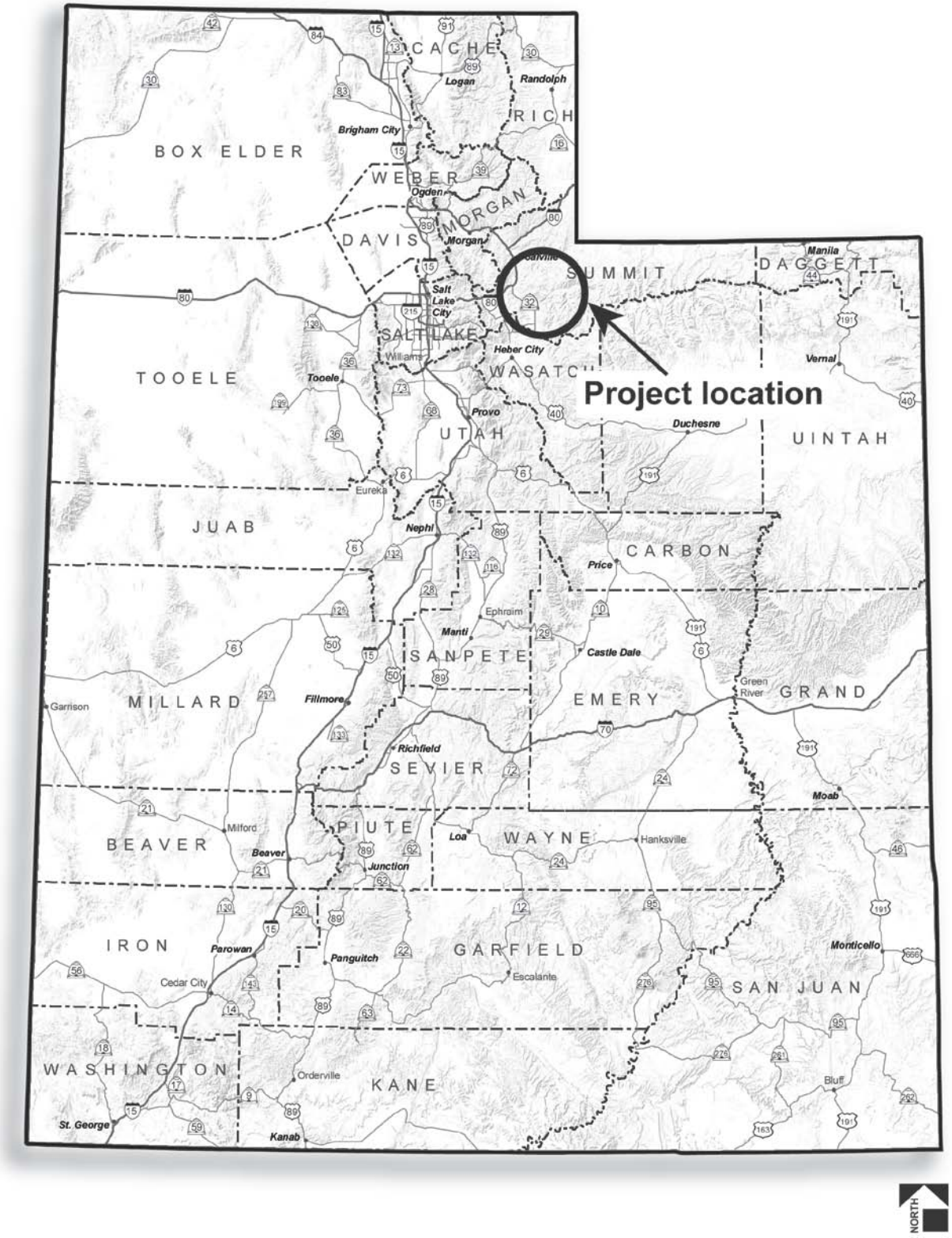

Figure 1. Project location.

Figure 2. Project area.

3. Ecological Setting

LSD biologist Gary Reese conducted site visits to the Park City Heights project area on December 6 and 7, 2010 and March 9, 14 and 16, 2011. Data was collected on the existing biological resources of the project area and vicinity. Site visit photographs are included in Appendix B. While snow was present throughout that period, conditions were ideal for evaluating the suitability of the habitat for large mammals and greater sage-grouse winter habitat. A collapsible snow shovel was used to remove the snow in those areas where the herbaceous flora needed to be evaluated (Photograph 1). A four wheel drive vehicle aided in navigating the unimproved roads; areas not accessible by vehicle were surveyed on foot.

The project area is located within the Utah-Wyoming Rocky Mountains Ecological Region, which includes the mountains just north of Yellowstone National Park in south-central Montana, the Bighorn Mountains in northeast Wyoming, the Uinta Mountains of northeast Utah and Northwest Colorado, Utah's Wasatch Range, and the mountains and valleys of the southeastern corner of Idaho (Noss et al. 2001). Park City, which encompasses approximately 12 square miles with a resident population of approximately 7,300 people (2000 Census) and a substantial tourism industry, is located on the east side of the Wasatch Range. Park City consists of a core downtown area that is surrounded by lower-density residential and commercial developments, golf courses, and ski resorts.

The developable property is a 216-acre vegetated parcel that is situated south of Silver Creek, in the part of Richardson Flat lying west of the US 40 grade (Photograph 2). Elevation ranges from 6,640 to 7,580 feet. The highway realignment in the late 1980s resulted in an embankment being built across the western side of Richardson Flat (Photograph 3). Richardson Flat is located in a low gradient valley surrounded by hills of about 1,000 feet relief. The hills are comprised of either Woodside Shale or Weber Quartzite (Bromfield and Crittenden 1971). The erosion and weathering of these hills formed the old alluvial soils of the foothills. These soils are rich in clay and exhibit very low water permeability. The flat is drained by Silver Creek (Photograph 4), which flows from Park City to its east, then turns north from the developable property and passes the Richardson Flat tailings. The tailings and the riparian zone for Silver Creek have been undergoing remediation for heavy metal toxicity, left as a legacy of historic mining around Park City.

Figure 3 provides a map of the vegetation communities on the developable property, which includes six natural habitats and two types of disturbed areas. The vegetation communities are: Gambel oak shrubland (108 acres), mountain big sagebrush shrubland (99 acres), mountain big sagebrush - Saskatoon serviceberry shrubland (2 acres), sparsely vegetated wet meadow (1 acre), Douglas-fir woodland (1 acre), and quaking aspen shrubland (less than 1 acre). Disturbed areas include ruderal vegetation (7 acres highway grade and 2 acres abandoned railroad grade); and excavated land (4 acres). The wet meadow and part of the aspen shrubland are riparian wetland habitat, the remainder is upland.

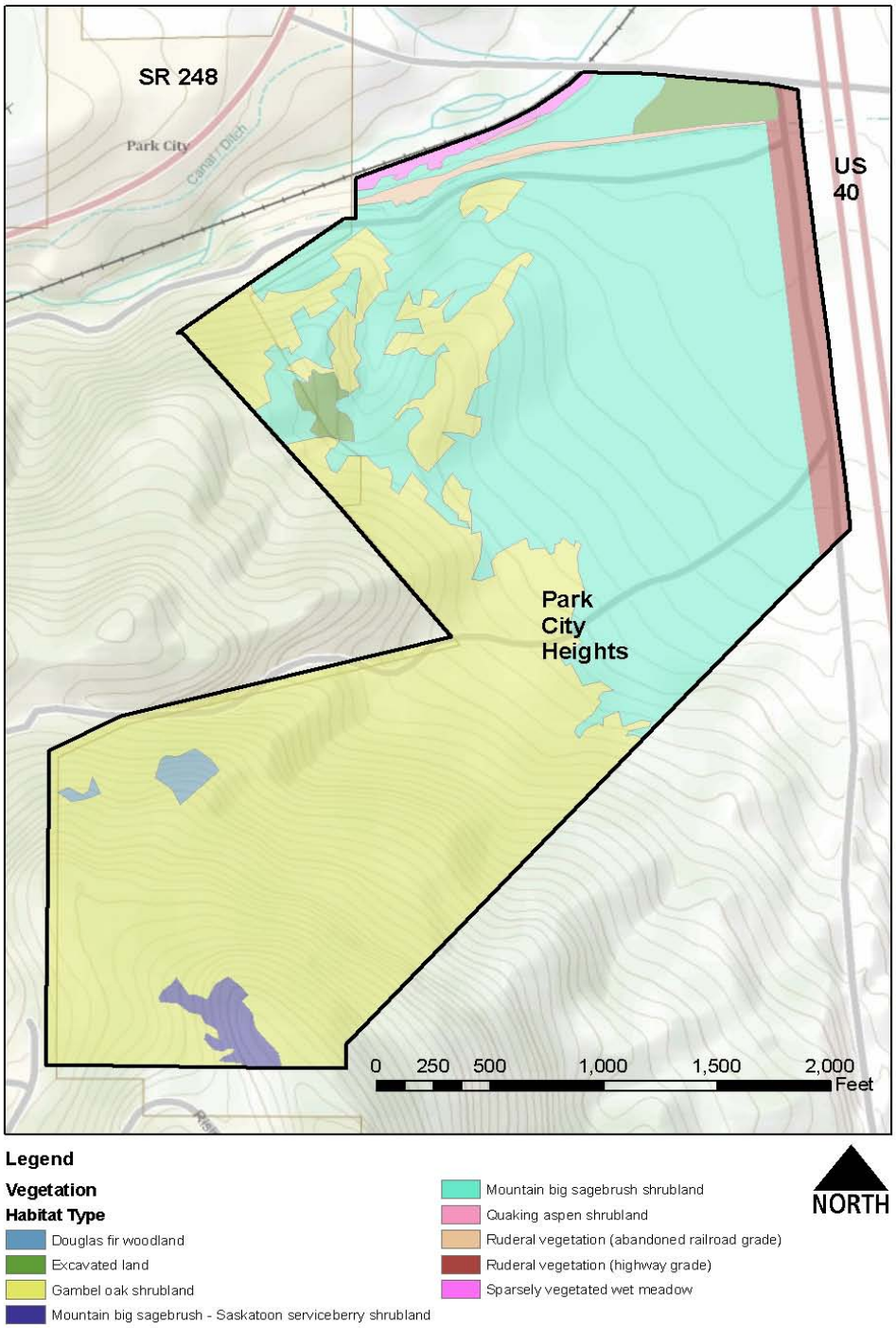

Figure 3. Vegetation communities and disturbed land types on the developable property.

Gambel Oak Shrubland

Shrublands dominated by Gambel oak (*Quercus gambelii*) are the most common habitat type in the developable property. The oaks form thickets averaging 20 feet high and have sparse understories of shrubs, grasses, and herbs. These shrublands generally occupy steeper slopes and higher elevations in the project area (Photograph 5) than does the Mountain big sagebrush shrubland. The dense bushy environment provides cover for animals and their young. The high tannin content of Gambel oak doesn't seem to bother mule deer, who browse year-round on its foliage. Oak acorns which are rich in carbohydrates, fats, and proteins take a year to mature. Oak acorns are important food sources for ravens, jays, turkeys, squirrels, chipmunk, and deer.

Mountain Big Sagebrush Shrubland

Mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) shrubland is the second most extensive habitat on the developable property (Photograph 6). It extends throughout the eastern side of the developable property, occupying moderate slopes. Mountain big sagebrush dominates the shrub canopy, with localized Saskatoon serviceberry (*Amelanchier alnifolia*) as an associated species. The average cover of sagebrush emerging from 9 inches of snow was 28 percent, with an average height of 23 inches emergent above snow. The herbaceous understory has been diminished from many years of grazing by cattle, sheep and horses. The understory appears to be dominated by cheatgrass (*Bromus tectorum*), an exotic grass which has invaded sagebrush rangelands throughout the region.

Big sagebrush is highly preferred and nutritious winter forage for mule deer, and provides habitat for a diverse assemblage of birds and mammals across the western United States (Welsh 2005). Songbirds such as dark-eyed juncos, horned larks, and white-crowned sparrows occupy sagebrush and consume big sagebrush seed. Additionally, the greater sage grouse requires sagebrush for its survival.

Mountain Big Sagebrush – Saskatoon Serviceberry Shrubland

The transition zone between Gambel oak and mountain big sagebrush is where Saskatoon serviceberry is most common. These edge areas are highly variable in vegetative composition and are not readily mappable on aerial photography. However, this plant community forms a mappable habitat on ridgelines, a topographic feature protected under the Park City SLO Zone Regulations. Mountain big sagebrush – Saskatoon serviceberry shrubland is important wildlife habitat due to the proximity of protective oak cover to serviceberry plants and its fruits. Deer and moose browse serviceberry and its fruit is relished by a variety of song and game birds (NRCS 2006). The ridgeline will not be directly impacted by the proposed development.

Sagebrush and serviceberry are co-dominants on the ridge along the southern edge of the developable property (Photograph 7). This area had abundant wildlife tracks (Photograph 8) and was the only area with a significant herbaceous component to the shrubland. The grasses identified included slender wheatgrass (*Elymus trachycaulus*) and crested wheatgrass (*Agropyron cristatum*). Except in times of high winter wind, this ridgeline appears to provide excellent wildlife habitat. Deer Valley subdivisions are immediately below the ridge. Lack of cover and proximity to homes limit the utilization of this habitat to species which tolerate human presence.

Sparsely Vegetated Wet Meadow

Silver Creek flows within 5 to 100 feet of the northeastern edge of the developable property. The floodplain is bisected by a historic Union Pacific railroad grade, now converted to a rail trail. The ballast which built up the railroad bed is from mining operations and is toxic. The rail trail and Richardson Flat Road are the northern boundary for the developable property. Silver Creek is classified as a cold water fishery and supports willows (*Salix* spp.), cattails (*Typha latifolia*), and emergent and floating vegetation. The density and height of this riparian vegetation is quite variable, depending on the influence of beaver dams.

Along the rail trail is a sparsely vegetated wet meadow where the vegetation is dominated by sedges, with a small patch of aspen (*Populus tremuloides*) (Photograph 9). The wet meadow may be sparsely vegetated due to soil toxicity, or having been covered with soil.

Riparian habitats associated with Silver Creek are adjacent to the developable property and will not be disturbed by the proposed development. These riparian habitats will continue to offer forage and cover for birds, mammals (including resident beavers), fish, amphibians, reptiles, and aquatic invertebrates. Birds expected in the area include: red-tailed hawk, bald eagle (non-nesting), killdeer, rock pigeon, belted kingfisher, northern flicker, black-billed magpie, common raven, black-capped chickadee, European starling, song sparrow, dark-eyed junco, and house finch.

Douglas-fir Woodland

Two small groves of Douglas-fir (*Pseudotsuga menziesii*) occupy a sheltered area below the ridge line and in a valley between two hills within the Gambel oak shrubland. This vegetation type was only examined through binoculars due to deep snow buildup and hazardous walking conditions. These groves can provide nesting sites and cover for birds such as owls and woodpeckers, as well as tree canopy habitat for squirrels.

Quaking Aspen Shrubland

Twelve 20 feet high quaking aspen (*Populus tremuloides*) saplings occupy the upland edge of the sparsely vegetated wet meadow (Photograph 9). There are 4 to 6 feet high suckers colonizing the wet meadow near

the saplings. This appears to be vegetative recovery after beaver removal. With time, these saplings will probably be felled by the beaver lodging immediately north in Silver Creek. This vegetative type is narrow and barely evident on the 2009, 1:945 scale aerial photography that was used for mapping the vegetation of the developable property.

Ruderal Vegetation

The area between the riparian habitat and the sagebrush uplands is bisected by an historic alignment of the Richardson Flat Road (now a two-track on the south side of Silver Creek) and an abandoned railroad spur (Photograph 10). The abandoned railroad grade and its cut embankments are dominated by weedy plants which have spontaneously colonized the site after the tracks were removed.

A steep embankment on the east side of the developable property is a highway re-seeding after construction of a grade for US 40 in the late 1980s. The seeding is a mix of grasses and herbs (Photograph 11). The top of the embankment is flat and has an unimproved road running parallel to the US 40 right-of-way fence.

Excavated Land

A 4-acre excavated site in the northeast corner of the developable property is used in winter as the Park City snow storage area (Photograph 12). It is also used as an unimproved parking lot and staging area for heavy equipment.

Wildlife

Various owls and raptors may occur incidentally throughout the project area. While there were perch sites on power line poles near the riparian area, no large nests were observed. Fresh tracks representing bobcat, turkey, coyote, and fox were observed during the site visit. Large mammal (e.g. ungulates, such as deer, elk, and moose) have been reported in the area by Utah Big Game Range Trend Studies and migrate across Silver Creek, crossing SR 248 both north and south (Dynamac Corporation 2002). They may be attracted to the willows to forage; however, because of the small size of the riparian area, large-scale vegetation removal in the last 20 years, and nearby human presence, it does not provide adequate cover areas for breeding. The riparian corridor may see occasional foraging use by these species.

Use of the project area by wildlife would be relatively similar between different seasons, with the exception that fewer species would be present in winter because many species migrate or hibernate to escape cold temperatures and scarce resources. Winter is when larger species such as deer and elk are more likely to risk entering the developed areas of Park City to browse on the supplemental vegetation available in landscaped areas, particularly golf courses and gardens.

The steep oak shrublands and riparian corridor can serve as linkages for wildlife movements in fragmented landscapes. But the portion of the developable property to be developed currently has reduced value as a movement corridor because of the extent of human presence, the barrier fence along US 40, and the openness of the habitat in full view to any predator perched on the US 40 embankment. These factors preclude the movements of many wildlife species through the proposed developable property.

In summary, the project area currently provides various habitats for wildlife species that tolerate the presence of human development and disturbance. These species consist of small bird and mammal species with relatively small home range requirements. The surrounding habitat not proposed for development offers habitat for a variety of species. Although the area proposed for development may receive occasional use by wildlife for cover, foraging, roosting, and perching, occurrences by these species would be incidental and the habitat in the proposed development area is not critical to the survival of these species in the greater Park City area.

4. Species Identification

Threatened, Endangered, and Sensitive Species

The US Fish and Wildlife Service (USFWS) list of endangered, threatened, proposed, candidate, and conservation agreement species occurring in Summit County and the Utah Division of Wildlife Resources (UDWR) list of sensitive species for Summit County were reviewed to determine if any of these special status species have the potential to occur within the project area. Species included on the USFWS and UDWR lists are addressed in Table 1. No plants were included on either the USFWS or UDWR lists for Summit County. A project coordination letter from UDWR revealed that UDWR has not documented the presence of any special status species within the project area. The project area does not include any critical habitat that has been designated or proposed under the Endangered Species Act (16 U.S. Code 1531–1544, as amended).

Table 1. Special status species potentially occurring in the project area

Species	Status[a]	Habitat Requirements	Suitable Habitat Present?
Invertebrates			
Deseret mountainsnail (*Oreohelix peripherica*)	SPC	Closely associated with limestone outcrops under vegetation and associated leaf litter, specifically mountain maple (Acer sp.), scrub oak (Quercus gambelii), and balsam root (Balsamorhiza sp.).	Project area is outside of species' known distribution.
Western pearlshell (*Margaritifera falcata*)	SPC	Small streams. Possibly extirpated in Utah, although small populations may exist in historical localities.	Project area is outside of species' known distribution.
Fish			
Bluehead sucker (*Catostomus discobolus*)	CS	A benthic species of small or mid-sized tributaries of moderate-to-fast velocity in high gradient reaches of mountain rivers of the Upper Colorado River system, the Snake River, and the Lake Bonneville basin.	Project area is outside of species' known distribution.
Boneytail (Gila elegans)	ESA LE	Colorado River drainage	Project area is outside of species' known distribution.
Bonneville cutthroat trout (*Oncorhynchus clarkia utah*)	ESA LE	Found in a number of habitat types, ranging from high elevation mountain streams and lakes to low elevation grassland streams. In all habitats, a functional stream riparian zone providing structure, cover, shade and bank stability is required.	Historically present throughout the region; there are no recent records from Silver Creek.
Colorado River cutthroat trout (*Oncorhynchus clarkia pleuriticus)*	CS	This subspecies of the cutthroat trout that is native to the upper Colorado River drainage of UT, WY, CO, AZ, and NM has been reintroduced into lakes in the Uinta Mountains, in the northeastern part of the state.	Project area is outside of species' known distribution.
Colorado pikeminnow *(Ptychocheilus lucius)*	ESA LE	Colorado river drainage	Project area is outside of species' known distribution.
Humpback chub (Gila cypha)	ESA LE	Colorado river drainage	Project area is outside of species' known distribution.
Least chub (Iotichthys phlegethontis)	ESA C	Springs, streams and lakes associated with the Bonneville Basin	Project area is outside of species' known distribution.
Razorback sucker (Xyrauchen texanus)	ESA LE	Colorado river drainage	Project area is outside of species' known distribution.
Northern Leatherside chub (*Lepidomeda Copei*)	SPC	Native to streams and rivers of the southeastern portion of the Bonneville Basin.	Project area is outside of species' known distribution.

Table 1. Special status species potentially occurring in the project area (continued)

Species	Status[a]	Habitat Requirements	Suitable Habitat Present?
Reptiles and Amphibians			
Columbia River spotted frog (*Rana luteiventris*)	CS	Isolated springs and seeps which have a permanent water source with areas that do not freeze in winter; lays eggs primarily in pools of water without fish; cat-tails habitat rarely used, with preference for emergent sedges and willows; individuals may migrate along riparian corridors in spring and summer after breeding.	Historical records for this species near Jordanelle Reservoir, species no longer present by 1991. No suitable habitat within or adjacent to the project area.
Smooth green snake (*Opheodrys vernalis*)	SPC	Moist areas, especially moist grassy areas and meadows where it is camouflaged due to its solid green dorsal coloration.	According to UDWR natural heritage records, there are no documented occurrences of this species in Summit County.
Western toad (*Bufo boreas*)	SPC	Found in a variety of habitats, including slow moving streams, wetlands, desert springs, ponds, lakes, meadows, and woodlands.	Project area is outside of species' known distribution.
Birds			
Bald eagle (*Haliaeetus leucocephalus*)	SPC	Nests in tall trees near bodies of water where fish and waterfowl prey are available. Winters in sheltered stands of trees near open water. Generally avoid human activity and development.	Occurrence in project area is unlikely. Occurrence would be incidental; no foraging, roosting, or nesting habitat is present.
Bobolink (*Dolichonyx oryzivorus*)	SPC	Wet meadows, grasslands, and agricultural areas associated with riparian or wetland areas. Populations in Utah are found in the northern half of the state near Logan, Brigham City, Kamas, Heber, Morgan, Mountain Green, Huntsville, West Layton, Provo, and Bear Lake.	Not expected to occur in the project area due to a limited area of potential suitable habitat.
Ferruginous hawk (*Buteo regalis*)	SPC	Flat and rolling terrain in grasslands, agriculture lands, sagebrush/saltbush/greasewood shrub lands, and at the periphery of pinyon-juniper forests. In the winter, uses farmlands, grasslands, deserts, and other arid regions where lagomorphs, prairie dogs, or other major prey items are present.	Occurrence in project area is unlikely. Occurrence would be incidental; no foraging, roosting, or nesting habitat is present.
Grasshopper Sparrow (*Ammodramus Savannarum*)	SPC	Summer resident, nesting in Utah in grasslands or shrub-steppe with a minor component of sagebrush.	No suitable habitat in the project area.
Greater sage-grouse (*Centrocercus urophasianus*)	ESA C	Plains, foothills, and mountain valleys with an overstory of sagebrush and an understory of grasses and forbes for breeding habitat which maybe adjacent to wet meadow areas for brooding habitat. Low density sagebrush on south and southwestern slopes below ca. 6500 feet for winter habitat.	Occupied habitat within a ½-mile radius of the project area, but no suitable habitat within the project area.

Table 1. Special status species potentially occurring in the project area (continued)

Species	Status[a]	Habitat Requirements	Suitable Habitat Present?
Birds (continued)			
Lewis's woodpecker (*Melanerpes lewis*)	SPC	Within Utah, found in central part of state in open park-like ponderosa pine forests. Attracted to burned Douglas-fir, mixed conifer, pinyon-juniper, riparian, and oak woodlands. Prefers understory of grasses and shrubs to support insect prey populations. Nests in dead trees and stumps.	No suitable nesting habitat in the project area. Occurrence in the project area is unlikely based on the lack of Ponderosa pine or burned habitat and lack of understory in Douglas fir and Gambel oak.
Northern goshawk (*Accipiter gentilis*)	CS	Uncommon, permanent resident in Utah. Prefers montane forests and riparian zone habitats.	No suitable habitat in the project area.
Short-eared owl (Asio flammeus)	SPC	Large open grassland or non-riparian wetland areas, such as hayland, retired cropland, small-grain stubble, shrub-steppe and wet meadow zones of wetlands. Breeds in Utah in wetlands and grassland habitat; in winter roosts in forests and woodlands, forages in agricultural fields.	Occupied habitat in the vicinity of the project area, but no suitable breeding or foraging habitat within or adjacent to the project area.
Three-toed woodpecker (*Picoides tridactylus*)	SPC	Engelmann spruce, sub-alpine fir, Douglas fir, grand fir, pondersosa pine, tamarack, aspen, and lodgepole pine forests, generally above 8,000 feet. Require soft wood for excavation and scaly barked trees or snags infested with boring insects for foraging.	No suitable habitat in the project area.
Western Yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	ESA C	Rare breeder in Utah. Large blocks of riparian habitat with dense sub-canopies below 6,500 feet.	No suitable habitat in the project area.
Mammals			
Black-footed ferret (*Mustela nigripes*)	ESA LE	Underground prairie dog borrows. Reintroduced to the Coyote Basin of Uintah County, Utah.	Project area is outside of species' known distribution.
Canada lynx (*Lynx canadensis*)	ESA LT	Montane conifer forests. Rare in Utah.	Project area is outside of species' known distribution.
Elk (*Cervus canadensis*)	Park City	Possible incidental use of project area. Habitat unsuitable due to proximity of roads, fences, and human use. Project will not preclude movement of animals through the area.	
Moose (*Alces alces*)	Park City	Possible incidental use of project area in association with adjacent Silver Creek riparian corridor, which will not be disturbed by the project. No preferred foraging habitat of riparian shrubs and aquatic vegetation in area. Habitat unsuitable due to proximity of roads, fences, and human use. Project will not preclude movement of animals through the area.	
Mule deer (*Odocoileus hemionus*)	Park City	Present in project area, with suitable habitat on slopes of oak shrubland that will remain undisturbed. Project will not preclude movement of animals through the area.	
White-tailed prairie dog (*Cynomys leucurus)*	SPC	Form colonies and spend much of their time in underground burrows.	Project area is outside of species' known distribution.

Source: Utah Conservation Data Center, <http://dwrcdc.nr.utah.gov/ucdc/ViewReports/te_cnty.htm>; <http://dwrcdc.nr.utah.gov/ucdc/ViewReports/sscounty.htm>; and <http://www.fws.gov/utahfieldoffice/Documents/Species%20by%20County_12092010.pdf>. Accessed December 15 2010.

[a] Status definitions: SPC=Wildlife of Special Concern in Utah, CS=Species receiving special management under a Conservation Agreement in order to preclude the need for Federal listing, ESA=Endangered Species Act, C=Candidate, LE=Listed Endangered, LT=Listed Threatened

5. Habitat Suitability for the Greater Sage-grouse

This section provides an informed evaluation of the habitat suitability of the developable property for greater sage-grouse (*Centrocercus urophasianus*) in various seasons. It is based on field surveys, 2009 aerial imagery interpretation of the project area, and findings in recent published research studies and from the greater sage-grouse conservation plan for Morgan and Summit Counties, Utah (MSARM 2006).

The proposed Park City Heights development project lies within an area presently mapped by the UDWR as greater sage-grouse habitat. A shapefile of the property boundaries, including lands north of Silver Creek to the junction of SR 248 and US 40, was submitted to the UDWR along with a request for a sensitive species overview of the area. A response letter dated December 13, 2010 (Appendix C) stated that "Within a ½-mile radius of the project area (sections 2 and 8, Township 2 South, Range 4 East), the Utah Division of Wildlife Resources (UDWR) has recent records for greater sage-grouse." No additional information on the sage-grouse occurrences was provided by UDWR.

In 1999, the UDWR mapped at a 1:980,000 scale the extent of seasonal habitat types for greater sage-grouse in the Morgan and Summit Counties Resource Area (MSARM 2006). Figure 4 from that report depicts sage-grouse nesting and brood habitat. It is of sufficient resolution to depict occupied nesting and brood habitat in the valley drained by Silver Creek, including the Richardson Flat area. Figure 5 from that report depicts winter habitat over the entire project area and region. These maps appear to be derived from the SGID93_BIOSCIENCE-Habitat-SageGrouseBrood and SGID93_BIOSCIENCE-Habitat-SageGrouse Winter geographical information system (GIS) data layers available at the Utah GIS Portal. Those data sets represent sage-grouse brooding and winter use areas in Utah as determined by UDWR field biologists in spring 1999. They show brood habitat extending into the project area and winter habitat over the entire property. Noteworthy is that boundaries of both potential habitats are highly generalized at this mapping scale, and thus included areas which scientific studies have shown are not preferred habitat.

Doherty, et al. 2010 produced a map depicting the location and relative population size of sage-grouse breeding areas (leks) in the western United States. For the Park City area of the map, the Silver Creek valley, extending from Richardson Flats north 4 miles to Interstate 80, has at least three leks, which are all categorized in the smallest population size class. These low density leks are shown as 8.5 kilometer (km) diameter areas, to denote the typical range around a lek within fragmented habitats like Richardson Flat. The implication of this size class analysis is that leks like the ones in the project vicinity should be considered of lower priority.

Further evidence of a low density of birds in western Summit County is provided by lek survey results in a report by UDWR (2005). It reports three leks surveyed in 1995 and one lek in 2000 and 2001. There were only one male and three females birds counted. However, not all leks are counted on a reoccurring basis.

Suitable habitat depends on a wide variety of factors which can transform a habitat with preferred vegetation into one that sage-grouse won't occupy. For the property area, these exclusionary factors included poor quality habitat, such as exotic plant dominance and even-aged structure; unsuitable habitat such as oak shrubland; unsuitable topography and aspect; omnipresent human disturbance such as roads, parking lots, and construction staging areas; transmission lines and poles; presence of known predators; toxic soils; wildlife exclusion fencing; juniper encroachment; habitat fragmentation; and adjacent developed land. The following discussion provides evidence to support a hypothesis that the combination of these factors within the property area makes the developable property poorly suited to supporting sage-grouse in any season.

Preferred and suitable habitats for sage-grouse depend, in part, upon the topography, as well as the structure and composition of existing vegetation, which varies by season. Preferred topography and aspect for sage-grouse wintering habitat has been determined in research studies summarized by Connelly et al. (2011) to be on south or southwest-facing aspects. These aspects capture sun at the best angles for warming sage-grouse during sunny days. They are also on gentle slopes of less than 5 percent grade. The project area is the direct opposite, being primarily northeastern slopes and in part over 5 percent grade. Most areas of undeveloped land near known leks and within these preferred winter habitat topographic parameters are east of the property area across US 40; on the eastern side of Silver Creek and Richardson Flat.

Sage-grouse are obligate sagebrush species, meaning that sagebrush (*Artemisia* sp.) is a necessary component of their habitat. The species, height, and cover of sagebrush selected as habitat depends upon the season and type of activity the sage-grouse are engaged in (i.e., breeding, nesting/brooding, or wintering). Much of the developable property is Gambel oak, which immediately excludes it from consideration as sage-grouse habitat. Research studies summarized by Connelly et al. (2011) shows that preferred sagebrush habitat must lie within a restricted range of cover and height classes for the shrub. These parameters varied by state. In Utah, satellite imagery was used by Homer et al. (1993) to classify winter habitat of sage-grouse into seven shrub categories. Wintering grouse preferred shrub habitats with medium to tall (16-24 inch high) shrubs and moderate shrub canopy cover (20–30 percent). Sage-grouse avoided winter habitats characterized by medium (16-20 inch high) shrub height with sparse (less than14 percent) sagebrush canopy cover. However, Bohne et al. (2007) caution that efforts to inventory wintering areas need to validate the maps of potential sage-grouse winter habitat indicated by vegetation and snow deposition patterns developed from aerial or satellite imagery. They summarized the winter range

sagebrush preferences of sage-grouse in Wyoming as 10-30 percent canopy cover, 10-14 inches in height above snow, with preference for windblown ridges with low sagebrush in a landscape mosaic of taller sagebrush. Sage-grouse winter range in Wyoming does not occur above 7,500 feet elevation, or in areas where there is Juniper (*Juniperus osteosperma*) encroachment.

Based upon eight transects of 100-200 feet in length, completed during the site visit when there was an average of nine inches snow cover, most of the sagebrush within the developable property exceeded the optimum height or cover parameters for preferred winter habitat. The average cover along the transects was 28 percent (range 8-46), with an average height of 32 inches (i.e., 23 inches emergent above snow; height range of 21 to 41 inches). However, winter sagebrush cover is dependent on snow depth. As the depth increases, emergent cover decreases. Records compiled by the Western Regional Climate Center indicate the average winter snow depth in Park City is 5-6 inches, with a February maximum of 18-20 inches. Thus as the winter progresses, less sagebrush is exposed and a migratory sage grouse population could move 50-100 miles (Patterson 1952) to lower elevations and milder conditions. When snow depths reach 14 inches, sage-grouse abandon flat areas for drainages and steeper southwest facing slopes (Autenrieth 1981, Hupp and Braun 1989). Thus, even if an optimum combination of sagebrush cover and height were attained sometime between January and March on the developable property, the 14 inches or greater average snow depth and northeast-facing aspect of the developable property would preclude winter occupancy by sage-grouse.

Brooding habitat must have available succulent forage. The sagebrush in the project area would classify under the National Vegetation Classification system as an *Artemisia tridentata* ssp. *vaseyana* / *Bromus tectorum* (Mountain big sagebrush / cheatgrass) Semi-natural Shrubland [and Sparse Shrubland] Association. The herbaceous understory vegetation is dominated by an exotic grass and poor in the quantity and quality of forage preferred by sage-grouse during brooding season.

Sage-grouse are potentially subject to increased mortality and disturbance resulting from manmade structures including fences, power lines, and other tall structures (wind turbines, communication towers), though this threat is poorly understood (MSARM 2006). Sage-grouse may fly into these structures which can result in death or may injure them to the point where they cannot effectively avoid predators. Sage-grouse mortalities due to collision with power lines, fences, and other tall structures have been observed in Colorado, Utah, and other areas (Gunnison Sage-grouse Rangewide Steering Committee 2005). Photograph 11 shows a five foot high, hog-wire fence along US 40 and an embankment fragmenting the developable property from more extensive and diverse sagebrush habitat in Richardson Flat, to the east. It apparently was installed to prevent moderate-sized mammals from entering the highway right-of-way and being a collision risk. Given its height and orientation along the crest of the embankment, it could present a hazard to low-flying sage-grouse. The poles provide perches for avian predators of sage-grouse, which

include black-billed magpie and common raven (both observed on a December 7 site visit), as well as eagles and hawks (MSARM 2006). The predators can also perch on the edge of the embankment and command a view of the entire acreage of sagebrush in the project area (Photographs 3 and 11). Along the oak/sagebrush transition are encroaching junipers which have been highline browsed in winter by deer and serve as perches for predators. Studies in Nevada have shown sage-grouse leks and brooding areas are not found within view of junipers, due to threats from predators (Dallin 2010).

While sagebrush adjacent to riparian zones can be a preferred habitat for nesting, a combination of exclusionary factors makes the developable property unsuitable habitat. A power line crosses the north end of the developable property near to the Silver Creek riparian area. The power line poles serve as perching sites for avian predators. From atop these poles, some of which are shown in Photograph 11 the entire upland/riparian transition area within the project area is visible to predators. Ravens were observed on these poles during the December field visit.

Welsh (2005) summarized the available research on sage-grouse habitat preference and concluded “the ideal brooding habitat would consist of big sagebrush with a canopy cover of some 25 percent with a small creek running through it. A riparian zone about 50 feet wide would reduce the big sagebrush canopy cover to zero and provide the needed forbs for the chicks to eat with the adjacent big sagebrush cover providing shading, loafing, escape, food, and a source of insects.” In contrast, the Silver Creek floodplain is approximately 500 feet wide and toxic waste underlies the riparian vegetation and pools formed by beaver activity. On the rail trail, the toxic ballast of the former Union Pacific Railroad has been partly paved over and presently provides a pedestrian rail trail through the riparian zone (SCWSG 2006). The riparian soils are also toxic from tailings of historic mining operations (Weston 1989). The toxicity is from heavy metals, primarily zinc, lead, and arsenic (EPA 2005). Grazing and browsing the vegetation rooted in these soils leads to bioaccumulation of the heavy metals in the food chain. The combination of all these exclusionary factors makes the north end of the property area both unsuitable and unfit habitat for sage-grouse.

Sage-grouse avoid areas of human presence. The perimeter of the developable property is heavily used by humans and is laced with two-track roads. The northern boundary has vehicle traffic on the paved Richardson Flats Road. Photograph 12 shows a parking and construction staging area in the northeast corner of the developable property. A construction company operates a busy yard just across Silver Creek from the northwest corner of the project area. There are existing subdivisions adjacent to Gambel oak shrublands and mountain big sagebrush-Saskatoon serviceberry shrubland habitats just beyond the west property boundary. The entire eastern property boundary is an embankment for US 40. Only the southern property boundary is unoccupied by humans. Thus, sage-grouse within the fragmented sagebrush habitat of the property cannot escape the visual and auditory presence of humans.

6. Findings

The location of the proposed Park City Heights development provides limited habitat for native wildlife species. Habitat values have been compromised due to adjacent highways, roadways, and fences that fragment habitats; the presence of power lines and power poles; the severely degraded condition of the meadow zone; and presence of toxic soils within the Silver Creek riparian corridor. The best habitats present on the property include oak shrubland on the slopes, and a small stand of Douglas-fir trees; these areas and the riparian corridor will remain as open space. Park City's SLO Zone Regulations limits the density of residential development of oak shrublands. This vegetation community provides sensitive wildlife habitat and occupies steep slopes generally unsuitable for development. Within the project area, approximately 4-8 acres of 108 acres of oak shrubland habitat will be impacted by the proposed development. Development is proposed for the edge of areas classified as oak shrubland. However, at this location the vegetation is composed of a poor diversity of sagebrush and low stature oaks, is fragmented by numerous openings, does not include the steep slopes, and is currently impacted by off-rood vehicle traffic and dirt roads that cross the area. The 100-104 acres of oak shrubland on the property that is identified for open space and will benefit from closing vehicle access and blocking dirt roads.

The proposed Park City Heights development is consistent with Section (B) Jurisdiction, subsection (1) Protection of Wildlife Habitat and Ecological Character, in the Park City Municipal Code – Title 15 LMC, Chapter 2.21 Sensitive Land Overlay Zone (SLO) Regulations. Section 6, Findings, addresses the four jurisdictional paragraphs under Section (B) (1) with respect to: (a) Construction timing, (b) Sensitive and specially valued species, (c) Connections, and (d) Wildlife conflicts.

Construction timing

Due to the project areas small size and the minimal availability of habitat for nesting by birds, few avian species are anticipated to occur; however, vegetation clearing and grubbing would still be minimized from April through July to avoid disturbance to nesting birds. No mass grading of open areas would occur during the avian nesting season, though clearing and grubbing limited to streets and buildable pads could occur during this time period if a detailed search for active bird nests is conducted. If a nest is found it would either be avoided until it is no longer in use, or a licensed bird rehabilitation center would recover the nestlings, meeting compliance requirements of the Migratory Bird Treaty Act.

Sensitive and Specially Valued Species

No habitats that would be used by threatened, endangered, or sensitive species during any part of the year were identified in or adjacent to the project area. Therefore, the proposed project will have no effect on any threatened or endangered species or its habitat and will not impact any sensitive species. The following paragraphs summarize the reasons why the three sensitive species listed by the Utah Department of

Natural Resources in a database search, as indicated by the letter provided in Appendix C, are not affected or impacted.

- Greater sage-grouse. The Utah Department of Natural Resources indicated a recent greater sage grouse record from within one half mile of sections 2 or 11, Township 2 South, Range 4 East, but did not provide further information on its location. A literature search revealed very small leks a few miles north of the project area, with a buffer area of possible brooding habitat extending to approximately one mile north of the project area. Section 5 above (Habitat Suitability for the Greater Sage-grouse) concludes that neither the project area nor adjacent lands are suitable habitat for this species in any season.

- Columbia spotted frog. The Utah Department of Natural Resources indicated a historic Columbia spotted frog occurrence from the vicinity of the project area, but did not state when nor where the species was found. Bailey, et al. (2006) stated that historic records are limited to museum collection records and anecdotal information from surveys conducted in the mid 1900's. During 1991 and 1992, all historically known locations as well as other suitable wetlands within its historic range, were surveyed for the occurrence of spotted frog. Results of that survey indicated that remaining nearby popul*ations were near the present day Jordanelle R*eservoir at Rock Cliff. This is known as the Jordanelle/Francis population (approximately 8 miles southeast of the project area), which previously included many extirpated populations extending north along Ross Creek, now under the reservoir pool. Thus, the applicable historical records for this species were all near Jordanelle Reservoir and were no longer extant by 1992. Additionally, since Silver Creek does not have springs and seeps with a permanent water source that does not freeze in winter, there is no suitable habitat within or adjacent to the project area.

- Short-eared owl. The Utah Department of Natural Resources indicated a recent short-eared owl occurrence from the vicinity of the project area, but did not state where the species was found. US Geological Survey and Utah State University (1999) showed that the nearest occurrences of short-eared owls were wintering populations 16 miles away at Coalville, Utah. This owl breeds in Utah in wetlands and grassland habitat. In winter it roosts in forests and woodlands, and forages in agricultural fields. If an incidental occurrence of a short-eared owl were to roost near the project area, it would be in oak scrub or isolated trees – habitats which are being protected in the proposed development. There are no suitable breeding or foraging habitats within or adjacent to the project area. Suitable habitat would require large open grassland or non-riparian wetland areas, such as hayland, retired cropland, small-grain stubble, shrub-steppe, and wet meadow zones of wetlands. The adjacent Silver Creek habitat is unsuitable as it lacks wet meadows. Short-eared owls do not typically utilize riparian areas in Utah (Romin and Much 1999). Rather, they exhibit a preference for

non-riparian meadows with sedges and grasses under 1.5 feet tall (BLM 2006), rather than the tall cattail and willow vegetation present along adjacent the reach of Silver Creek. The nearest available foraging habitat would be agricultural fields, which are outside the project area.

Connections

The proposed development would occur on approximately one-third (70-80 acres) of the developable property. As proposed, the development would be confined to mountain big sagebrush habitat and areas of ruderal vegetation. The project would result in a reduction in low quality wildlife habitat. Undeveloped lands on the developable property are contiguous with conservation easements on adjacent properties, thus provide interconnected habitats for wildlife occurring in the project vicinity. Species that currently occupy open space habitat are not likely to be substantially affected by a reduction in mountain sagebrush habitat. In addition, there are large areas of open space adjacent to undeveloped land within the developable property.

Wildlife conflicts

No wildlife conflicts are expected to occur with future occupants of the proposed development.

7. Recommendations

- Follow-up studies. Two additional site visits will occur by knowledgeable biologists during May/June 2011 to a) validate the observations of the biological report, b) determine if/how data from peak bird and wildlife breeding seasons may influence the findings of the report, and c) verify that the recommendations made in this study are still valid. Special considerations will be made to identify wildlife movement corridors, coyote/fox den sites, and any areas of high native species diversity (plants, animals, and/or insects).

- Animal movement corridors. Five site visits where conducted between December 2010 and March 2011 to ascertain movement corridors for animals. Winter movement corridors were determined by observations of tracks in snow, deer pellet concentrations, discussions with residents, and analysis of animal/vehicle collision rates per highway milepost. The lack of forage and protective cover in the mountain sagebrush community, along with its northeast facing slopes and deeper snows, makes it non-preferred habitat for the movement of animals larger than fox, bobcat, coyotes, and rabbits. Thus, the proposed development would have negligible effect on large animal movement. Mule deer and elk cross the property area on the ridgeline and, when shallower snow depths allow, the steep oak shrublands along the edge of and outside the area of the development. These areas will remain in natural condition. West of the property area are many pathways through oak shrubland to Silver Creek where animals find water. The lane divider on SR 248 and the eight feet high fence

north of the highway discourage movement of animals along that stretch of highway, but it does direct animals to the west and east where the fence is lower or missing. Of the few animals which cross, more animals cross to the west. Due to the degraded condition of habitat, presence of contaminated soils, and potential of animal/vehicle conflicts due to surrounding roads, no actions to encourage the presence of large ungulates (e.g., moose, elk, and deer) should be undertaken. Landscaping plans associated with the development, especially for lots that open to undeveloped lands, will consider the use of plants that are less desirable to wildlife. No additional fences to guide large mammals through the mix of development and open space are recommended. The animals that are present can be expected to readily adapt to the changing urban/open space landscape with most wildlife use focused on the western and southern facing open space slopes away from the proposed development. All development would be limited to the designed footprint in order to assure that wildlife areas remain in suitable condition and that wildlife that enters the area has safe passage around the development, especially following the Silver Creek corridor.

- Site Plan. The development project should be limited to the existing site plan, as shown in Appendix A. That site plan leaves most of the non-sagebrush habitat and cover in place.
- Wetlands. The housing development avoids all wetlands. However, the extension of the rail trail passes through/around wetland areas. Direct impacts to wetlands will be avoided or fully mitigated by assuring the trail does not impede the flow of water or impact the function of the wetland. The trail system provides opportunities to educate the public concerning the importance of wetlands (see Nature Study below).
- Noxious and invasive weed control. The mountain sagebrush community has cheatgrass, an invasive grass which established when the land was grazed by livestock. Controlling established cheatgrass is futile without extensive and repeated treatment with herbicides or prescribed fires. Much of the land with cheatgrass invasion is within the project area, and will ultimately be controlled by land grading. Due to the close proximity of US Highway 40 and SR 248 there is a likelihood for noxious and invasive weeds to colonize sagebrush habitat disturbed by construction activity. Therefore, any noxious weeds which become established on graded land in the project area should be physically removed or herbicide treated to prevent their spread throughout the project area and into adjacent areas.
- Bird nesting. Due to the project area's small size and the minimal availability of habitat for nesting by birds, few avian species are anticipated to occur; however, vegetation clearing and grubbing would still be minimized from April through July to avoid disturbance to nesting birds. No mass grading of open areas would occur during the avian nesting season, though clearing and grubbing

limited to streets and buildable pads could occur during this time period if a detailed search for active bird nests is conducted. If a nest is found it would either be avoided until it is no longer in use, or a licensed bird rehabilitation center would recover the nestlings, meeting compliance requirements of the Migratory Bird Treaty Act. Bluebird nesting boxes could be erected along the oak shrubland edge to attract bluebirds to the development.

- Nature study. Signage that highlights the opportunities for wildlife watching or ecological discovery could be provided, resulting in an enhanced recreational experience for residents using the trail system in the development. This could specifically include identification of major plants, ecological processes, wetland ecology, potential animal species, and insights into seasonal changes to the landscape. The trail system would be an ideal location for placement of bluebird nest boxes.
- Motorized vehicle disturbances in open space. There are five two-tracks unpaved roadways extending from the mountain sagebrush habitat into the oak shrubland. To enhance the value of the shrubland as open space and provide a secluded place for wildlife, it is recommended that the trails be closed to motorized vehicles. One two-track provides access to an adjacent parcel and a utility line. That road should remain maintained and available only for landowner access, with vehicle access beyond the parcel limited for emergency purposes only.
- Silver Creek. The existing riparian areas along Silver Creek have toxic soils, toxic ballast along the rail trail, and a sewage line through the riparian corridor topped with fill soil. The vegetation has been degraded and the wetland hydrology modified due to a road crossing and beaver activity. Both contribute to a long succession of deep pools and mucky soils. Over the course of three site visits in March 2011, no evidence (e.g., animals, tracks, or scat) of the movement of large mammals was observed at Silver Creek between US 40 and a construction company staging area just west of Richardson Flat Road, Additionally, small animal movement between the project area and Silver Creek is impeded by paved roads and the rail trail. No habitat enhancement of Silver Creek is recommended because a) it could attract large mammals and result in an increase in animal/vehicle collisions along Richardson Flat Road and SR.248, and b) due to heavy metal toxicity, the use of the area by large ungulates should be discouraged and preclude its management as a natural area.

8. Coordination

UDWR was consulted for species concerns during the development of this Biological Resources Overview. A letter from the UDWR regarding the project indicated that UDWR has not documented the presence of any special status species within the developable property, although three known or historical special status species occurrences were outside the project vicinity (Appendix C).

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10. Additional Information

Gary A. Reese conducted a field review of the project area on December 6 and 7, 2010. Photographs and field notes are on file at Logan Simpson Design Inc. This document was prepared by Gary Reese under the supervision of Bruce Palmer. Brief resumes of each follow:

Gary Reese, Project Biologist

Gary is a senior biologist who began his professional experience in 1975. He earned a master's in range ecology from Utah State University (USU) and has worked throughout Utah with the USDA Forest Service (USFS); USU Ecology Center; and U.S. Geological Survey. His expertise is in assessing vegetation resources; evaluating wildlife habitat; developing habitat management and conservation plans; wetland

delineation; noxious plant inventory; and special status species surveys. Gary has worked nationwide both for and within federal, regional, county, and city governments, identifying and evaluating over 1,100 areas for suitability as parks, wildlife areas, conservation easements, open space, and wetland reserves. He has also represented the interests of private, corporate, and non-profit landowners, conducting natural resource assessments and developing conservation plans. Gary has 30 years of experience in presenting findings to governmental entities, such as the USFS Intermountain Region; Utah Ecological Services Field Office (USFWS); the Utah Water Board; and regional Water Conservancy Districts.

Bruce Palmer, Senior Biologist/Logan Simpson Design Director of Biological Services

Bruce is a senior ecologist/wildlife biologist with over 30 years of experience in natural resource and endangered species management, and the application of environmental regulations with a focus on the Endangered Species Act (ESA) and National Environmental Policy Act (NEPA). Bruce has held program management positions with the Arizona Game and Fish Department (AGFD), and U.S. Fish and Wildlife Service (USFWS) in Arizona and California, leading conservation programs for some of the rarest species throughout the Southwest and Intermountain West. Bruce is considered an expert on species distribution and habitat relationships. For the USFWS, Bruce implemented and supervised species' recovery programs and interagency consultation under the ESA for numerous listed species of plants and animals. As coordinator of the USFWS California Condor Recovery Program, Bruce directed this high profile, multi-million dollar international conservation program that included captive breeding and releases to the wild in California, Arizona, and Baja California. Over the years, Bruce has worked on projects throughout the West, and has gained in-depth experience in environmental planning and compliance documentation; endangered species consultation; big game management; vegetation community delineation; habitat restoration; on-the-ground implementation of plant and animal species surveys, research, and management; and evaluating effects to species from a wide variety of land management actions.

11. Signatures

Prepared By: Gary A. Reese Date: March 2, 2011

Gary A. Reese, Senior Biologist
Logan Simpson Design Inc.

Reviewed/Approved By: Bruce K. Palmer Date: March 2, 2011

Bruce Palmer, Senior Biologist
Logan Simpson Design Inc.

Appendix A

Site Plan

PARK CITY HEIGHTS

CONCEPTUAL MASTER PLAN

NOVEMBER 7, 2010

Appendix B

Photographs

Photograph 1. Use of a collapsible shovel to sample vegetation under the snow pack.

Photograph 2. View of the developable property from the top of a ridge along the south west border of the property. Note US 40 running north south and SR 248 coming in from the west (left side of photograph).

Photograph 3. View of developable property looking north north-east from US 40 grade.

Photograph 4. View northeast along the rail trail. The Silver Creek riparian area is on the left and the sparsely vegetated wet meadow is on the right.

Photograph 5. View upslope along the powerline crossing the northern end of the developable property. This line passes through Gambel oak shrubland.

Photograph 6. View downslope along the powerline, looking east across the mountain big sagebrush in the northern part of the developable property. This line is close to the riparian area and the poles are perching sites for raptors.

Photograph 7. Mountain big sagebrush and Saskatoon serviceberry habitat on the ridge top at the southern end of the developable property.

Photograph 8. Detail of mountain big sagebrush emergent from the snowpack on the ridge line of the developable property. Abundant mammal tracks were present in this area, which abuts Deer Valley subdivisions.

Photograph 9. Quaking aspen shrubland illustrating aspen suckers and saplings along the wet meadow.

Photograph 10. Abandoned railroad grade along northern end of developable property.

Photograph 11. US 40 and right-of-way fence, looking south along a frontage road from the east side of developable property.

Photograph 12. Excavated area serving as a parking lot at northeast corner of the developable property.

Appendix C

UDWR Letter

JON M. HUNTSMAN, JR.
Governor
GARY R. HERBERT
Lieutenant Governor

State of Utah
DEPARTMENT OF NATURAL RESOURCES
MICHAEL R. STYLER
Executive Director
Division of Wildlife Resources
JAMES F. KARPOWITZ
Division Director

December 13, 2010

Gary Reese
Logan Simpson Design
3753 Howard Hughes Parkway #235
Las Vegas, NV 89169

Subject: Species of Concern Near the Richardson Flats Residential Development, Park City, Utah

Dear Gary Reese:

I am writing in response to your email dated December 8, 2010 regarding information on species of special concern proximal to the proposed Richardson Flats residential development located in Sections 2 and 11 of Township 2 South, Range 4 East, SLB&M, in Park City, Summit County, Utah.

Within a ½-mile radius of the project area noted above, the Utah Division of Wildlife Resources (UDWR) has recent records for greater sage-grouse. In addition, in the vicinity there are recent records of occurrence for short-eared owl and historical records of occurrence for Columbia spotted frog. All of the aforementioned species are included on the *Utah Sensitive Species List*.

The information provided in this letter is based on data existing in the Utah Division of Wildlife Resources' central database at the time of the request. It should not be regarded as a final statement on the occurrence of any species on or near the designated site, nor should it be considered a substitute for on-the-ground biological surveys. Moreover, because the Utah Division of Wildlife Resources' central database is continually updated, and because data requests are evaluated for the specific type of proposed action, any given response is only appropriate for its respective request.

In addition to the information you requested, other significant wildlife values might also be present on the designated site. Please contact UDWR's habitat manager for the northern region, Scott Walker, at (801) 476-2776 if you have any questions.

Please contact our office at (801) 538-4759 if you require further assistance.

Sincerely,

Sarah Lindsey

Sarah Lindsey
Information Manager
Utah Natural Heritage Program

cc: Scott Walker, NRO

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UTAH DNR WILDLIFE RESOURCES