Wildlife Habitat Management Plan for the Rio Lobo Property

Deschutes County, Oregon

Prepared for:

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MB&G Project No. 0101750

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Introduction

The Rio Lobo Property is located west of the City of Bend (City) in Deschutes County (County), Oregon. The Project Study Area (PSA) for this report includes the entire 375-acre ownership. The Rio Lobo Project Team (Project Team) is seeking a zone change for approximately 307 acres of the PSA from Urban Area Reserve (UAR) to Westside Transect Zone, wherein the density of development would require a minimum lot size of 2.5 acres. A Preliminary Plan depicting the 307-acre area to be re-zoned is included in Appendix A.

The PSA is located within biological mule deer and elk winter range, identified by Oregon Department of Fish and Wildlife (ODFW 2014). Winter range for these species generally extends west of the City across relatively lower elevations on lands with adequate forage and cover resources where deer and elk are known to overwinter. The PSA is not included in the Deschutes County Wildlife Area Combining Zone (WA Zone), a Goal 5 Resource, which was specifically created by the County in coordination with ODFW for conservation of high priority mule deer and elk winter range (Deschutes County 2008). In the vicinity of the PSA, the WA Zone is located north of Tumalo Creek and abutting the southwestern corner of the property on the east side of the creek.

Kevin Spencer of Empire Construction and Development, LLC, contracted Mason, Bruce & Girard, Inc. (MB&G) natural resource consultants to assess the potential impacts of low density residential development on mule deer and elk populations located on the PSA. This assessment intends to inform development design in order to reduce impacts to mule deer and elk using the PSA and to provide appropriate conservation measures to maintain the resource. MB&G conducted a field habitat assessment within the PSA in order to characterize the floral and faunal constituents of habitat types, as well as topography, aspect, and other habitat elements.

In this report, MB&G presents the results of the general habitat assessment of the entire PSA based on characteristics of each habitat type, such as vegetative components, structure, age class distribution, landscape position, topography, elevation, hydrologic regime, and management history. Also included are any habitat use patterns which might affect the design of a preliminary development plan. Finally, this report presents the primary management plan components and wildlife habitat conservation measures to demonstrate the Project Team's commitment to reduce impacts to elk and mule deer winter range habitat as well as conserve wildlife movement patterns within and adjacent to the PSA. Although the entire PSA was assessed, the management plan components and wildlife habitat conservation measures discussed in this report apply to the 307-acre area of the PSA that would be re-zoned to the Westside Transect Zone and subsequently developed. The Preliminary Plan depicting conservation areas, and Mule Deer and Elk Winter Range Project Overlap Figure are included as Appendix A, and project area photographs are included as Appendix B.

PSA Location

The PSA consists of approximately 375 acres adjacent to the northern border of a new housing development named “The Tree Farm” and abutting Shevlin Park to the west (Figure 1). Coordinates for the approximate center of the PSA are 44° 44’ 05.94” N 121° 22’ 28.31” W. Topographically, the PSA ranges in elevation from approximately 3,750 to 3,900 feet above mean sea level (msl). The PSA is predominantly flat except for a slope down to Tumalo Creek along the western edge of the PSA and a north-south draw in the southeast corner of the property.

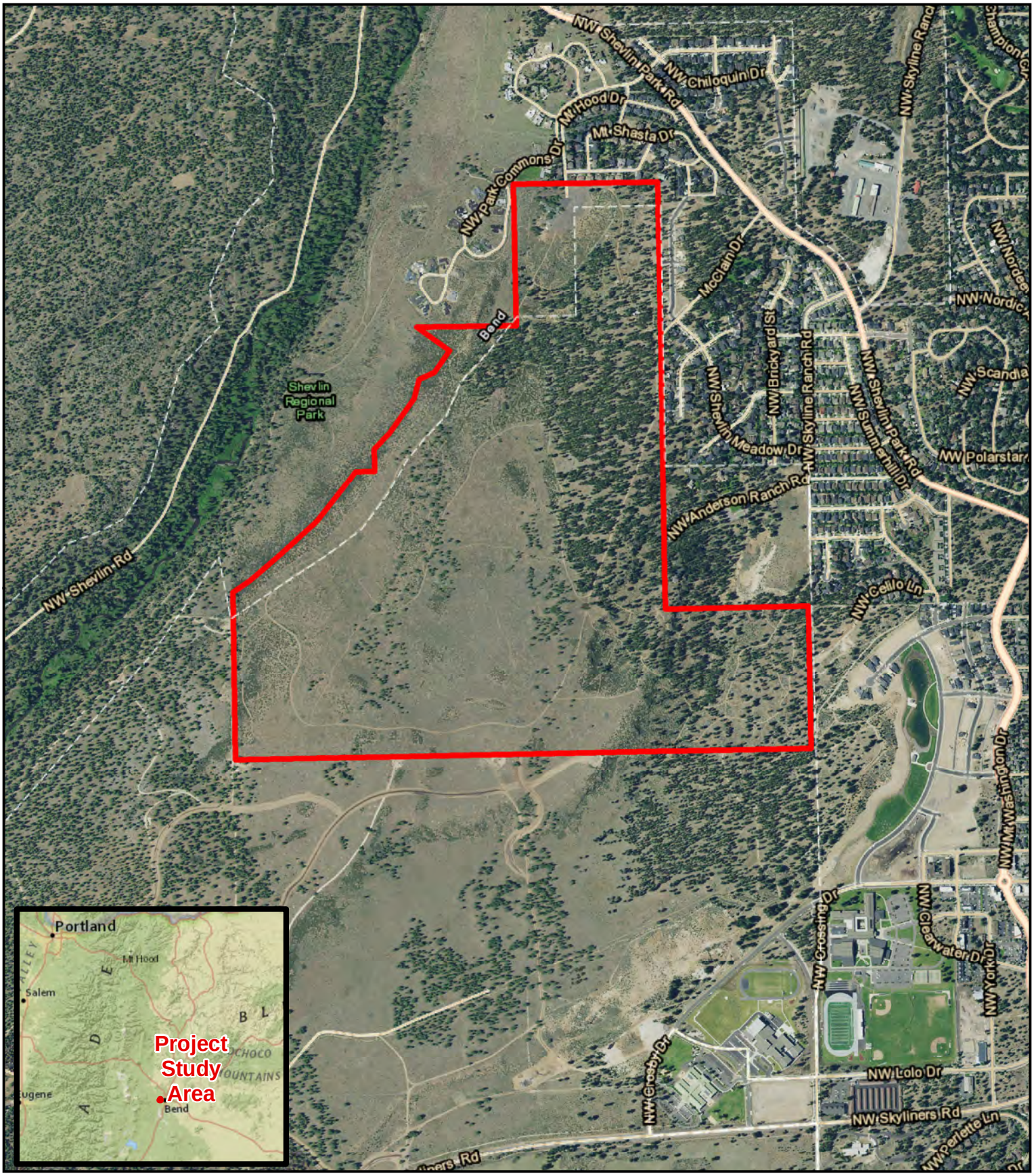

Figure 1.
Vicinity Map

Project Study Area (PSA)

MB&G

Source: Aerial imagery from NAIP 2016, all other data from MB&G. Reproduced for informational purposes and may not be suitable for legal, engineering or surveying purposes. Conclusions drawn from such information are the responsibility of the user.

0 300 600 1,200 Feet

WMP_Figure1_Vicinity, 12/20/2016

Rio Lobo Project
Deschutes County, Oregon

Methodology

On December 15th, 2016, and March 15th and 16th, 2017, MB&G wildlife biologists (Dr. Wendy Wente and Jenny McKay) traversed the PSA in order to identify and characterize discernable habitat types within the PSA. Habitats were characterized based on habitat descriptions developed by Johnson and O'Neil (2001). Aerial photos and topographic maps were used during the site investigation for navigation, verifying over-story type and canopy closure, and identifying potential wildlife movement corridors (National Agriculture Imagery Program [NAIP] 2016, United States Geological Survey [USGS] 1981). At representative observation points, the biologists evaluated and photo-documented various biological and physiographical characteristics of the habitat within the PSA. Observation point evaluations consisted of a habitat assessment including, but not limited to, dominant vegetation species inventory for each apparent structural layer within an approximate 100-foot radius of the plot center, average slope, landscape position, elevation, and other habitat elements such as proximity to cover, forage and water resources. Figure 2 presents a wildlife habitat type map of the PSA, including habitat observation point locations. Habitat types included on Figure 2 were determined based on results of the field survey as well as existing data.

In addition to characterizing on-site habitats, MB&G documented current deer and elk utilization as evidenced by observations of individuals and also by tracks, scat, rubs, use of shelter (beds or yarding), and browsing patterns of herbaceous and woody forage species. The MB&G biologists also noted signs of localized heavier use by deer and elk and evidence of corridor travel patterns.

Results

During the initial site visit on December 15th, 2016, a large snow event was underway with ongoing accumulation throughout the day, and MB&G biologists noted 18" to 24" of snow on the ground. The fresh snow greatly hampered the field effort. MB&G biologists returned in March, 2017 to collect the habitat usage and observation point data reported here. Unless otherwise noted, all observations discussed in the following sections are from the March, 2017 site visit.

General Site Description

Pre-field review of aerial photography of the site (Google Earth 2016) confirmed that the western extent of the PSA falls within the Awbrey Hall Fire perimeter, a wildfire that burned through the area in 1990. This fire removed most of the tree cover. The aerial photography and coarse pre-field habitat typing through the USGS National Gap Analysis Program (GAP) Land Cover Data Viewer indicated the presence of typical post-fire vegetation communities dominated by brush and bunchgrass species (Inter-mountain Basins Big Sagebrush Steppe Habitat [USGS 2001]). Some tree cover remains on the northeastern extent of the PSA and in other isolated pockets. In these areas, the USGS GAP Land Cover Data Viewer indicated the presence of forested

ecological types. Field observations of the specific vegetation communities and distribution of habitat patches present in the PSA are discussed in the Habitat Types section below.

In general, field observations confirmed that portions of the PSA were managed for fire suppression by regular tree limbing and thinning, as well as brushing and juniper removal. There were a number of unimproved roads and the PSA was subject to a moderate level of human disturbance due to its adjacency to Shevlin Park and suburban developments. Shevlin Park encompasses Tumalo Creek and its associated riparian area which are aligned in a northeasterly direction and parallel the western side of the PSA. Residential developments bordered the PSA to the east and to the north. An additional residential development was observed directly south of the PSA and was under construction during the March field visit. This development (The Tree Farm) had a series of paved roads with home lots for sale, however, home construction had not begun at the time of the March field survey. New residential homes were also being constructed adjacent to the northeast corner of the PSA.

Habitat Types

The PSA exhibited two habitat types available to wildlife species based on vegetation, topography, aspect, and land use impacts. Descriptions of these habitat types are listed below and have been modified from those described by Johnson and O'Neil in order to provide a more localized account of each habitat type (Johnson and O'Neil 2001). Appendix B includes example photographs of each habitat type. Figure 2 presents a map showing the approximate distribution of these habitat types and the location of the representative habitat observation points.

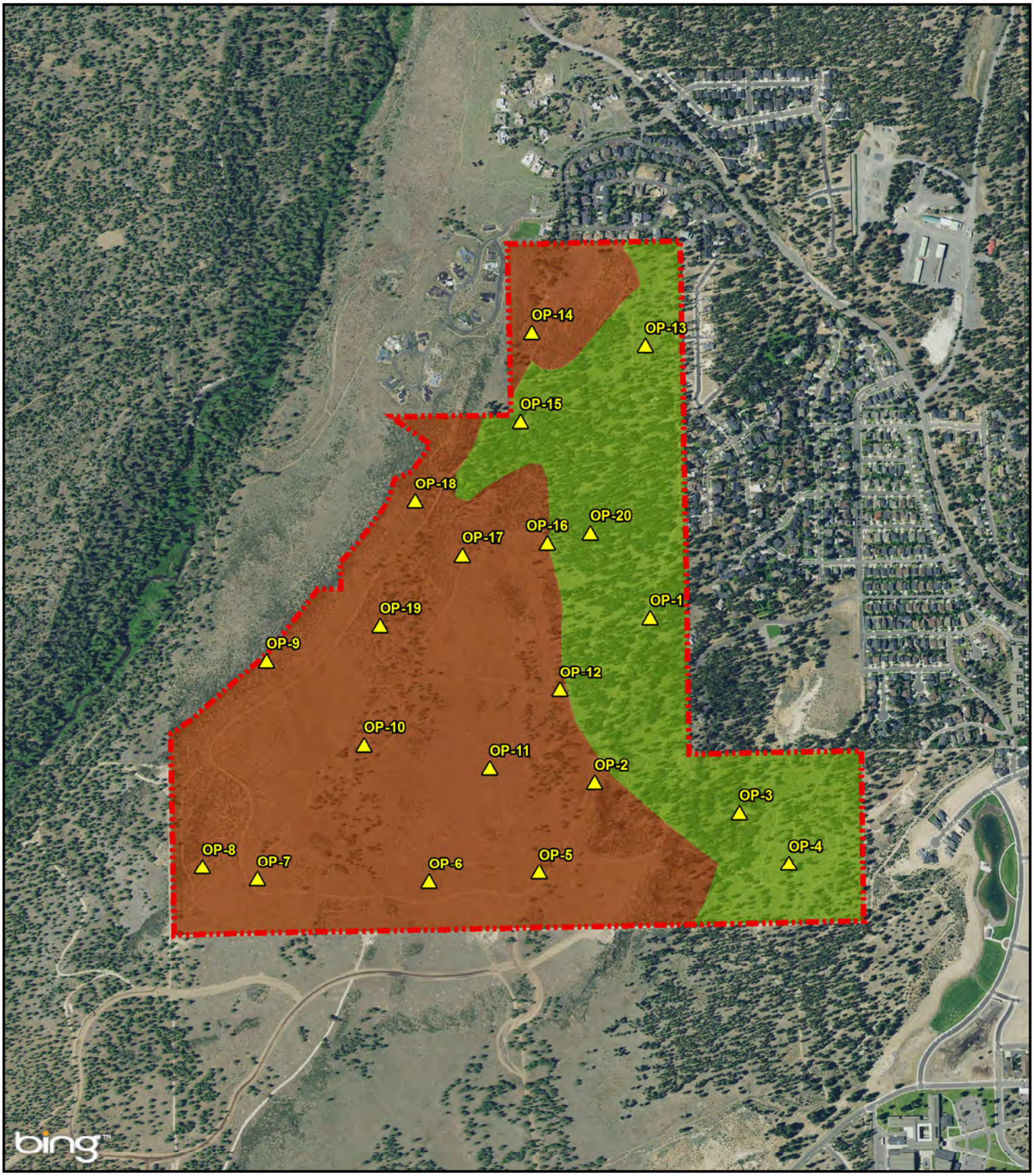

Figure 2.
Habitat Map

Project Study Area
ObservationPoint
Ponderosa Pine
Shrub-Steppe

MB&G

Source: Aerial imagery from NAIP 2016, all other data from MB&G. Reproduced for informational purposes and may not be suitable for legal, engineering or surveying purposes. Conclusions drawn from such information are the responsibility of the user.

0 250 500 1,000 Feet

WMP_Figure2_Habitat, 3/24/2017

Rio Lobo Project
Deschutes County, Oregon

Ponderosa Pine Forest (Observation Points 1, 3, 4, 13, 15, and 20)
This habitat is dominated by ponderosa pine (*Pinus ponderosa*) in the over story with occasional occurrence of western juniper (*Juniperus occidentalis*) (Photos 1 and 2, Appendix B). The shrub layer of the Ponderosa Pine Forest type was composed primarily of antelope bitterbrush (*Purshia tridentata*), manzanita (*Arctostaphylos sp.*), and rabbitbrush (*Chrysothamus viscidiflorus*). Grasses were dominated by Idaho fescue (*Festuca idahoensis*) and bottlebrush squirreltail (*Elymus elymoides*). Bare mineral soil and significant accumulations of pine needle duff covered unvegetated areas of the forest floor. Slopes within this habitat ranged from 0 to 25% and a draw traversed this habitat type in the southeast corner of the PSA.

Shrub-Steppe (Observation Points 2, 5-12, 14, and 16-19)
In 1990, the Awbrey Hall stand-replacement fire affected forested upland areas within the PSA. Most tree species were killed, leaving increased resources for emerging shrub and herbaceous species. Rabbitbrush, antelope bitterbrush, manzanita, snowbrush ceanothus (*Ceanothus velutinus*), Idaho fescue, and various other bunch grasses comprise the vegetation community in this area (Photos 3-6, Appendix B).

Deer and Elk Habitat Utilization Trends

Mule Deer Habitat and Migration Corridor
Mule deer are known to migrate through the PSA and use it as winter range. During the field investigation in March, MB&G biologists observed signs of diffuse movement through both habitat types discussed above. Resident deer use the PSA in its entirety during winter as evidenced by the presence of deer sign at observation points and other areas throughout the property (Photo 7, Appendix B). Within the shrub-steppe habitat type, there were several pockets of mature to decadent forage species attractive to ungulates. These pockets, along with forested habitat within the PSA provided evidence of bedding, foraging, and game trails. Based on this evidence, the PSA likely serves as both *in-situ* habitat and corridors for traveling to resources located outside of the PSA.

Key areas identified as travel corridors for deer included (Figure 3):

1. The northwest facing slope running northeast to southwest. This corridor extends along the western boundary of the PSA and parallels Shevlin Park to the west.
2. A corridor running northeast to southwest along the draw which transects the southeast corner of the property.

Elk Habitat
Elk are known to utilize the PSA, to a lesser extent than do deer, as evidenced by elk scat and tracks observed throughout the PSA. Elk tracks were noted in several areas between observation points 16 and 5, suggesting a north-south movement pattern throughout the property. However, elk scat was not observed at any of these points indicating that elk are likely moving through and not necessarily utilizing this portion of the PSA for long periods of time. Fairly extensive elk scat was located at observation point 19 along the corridor adjacent to Shevlin Park, suggesting yarding behavior in this area, at least temporarily (Photo 8, Appendix B).

Rock Outcrops

Due to topographical constraints and associated access difficulty, the lands immediately surrounding the bases of rock outcrops within the PSA are not regularly subject to brush removal. As such, these areas have developed pockets of older brushy vegetation communities, adding to their wildlife habitat value. Due to unique habitat qualities provided by rock outcrops, they serve as key habitat elements within the PSA for ungulates and other wildlife species. These areas also provide visual and physical cover and they are used as secure bedding and browsing locations, specifically for deer (Photo 10, in Appendix B).

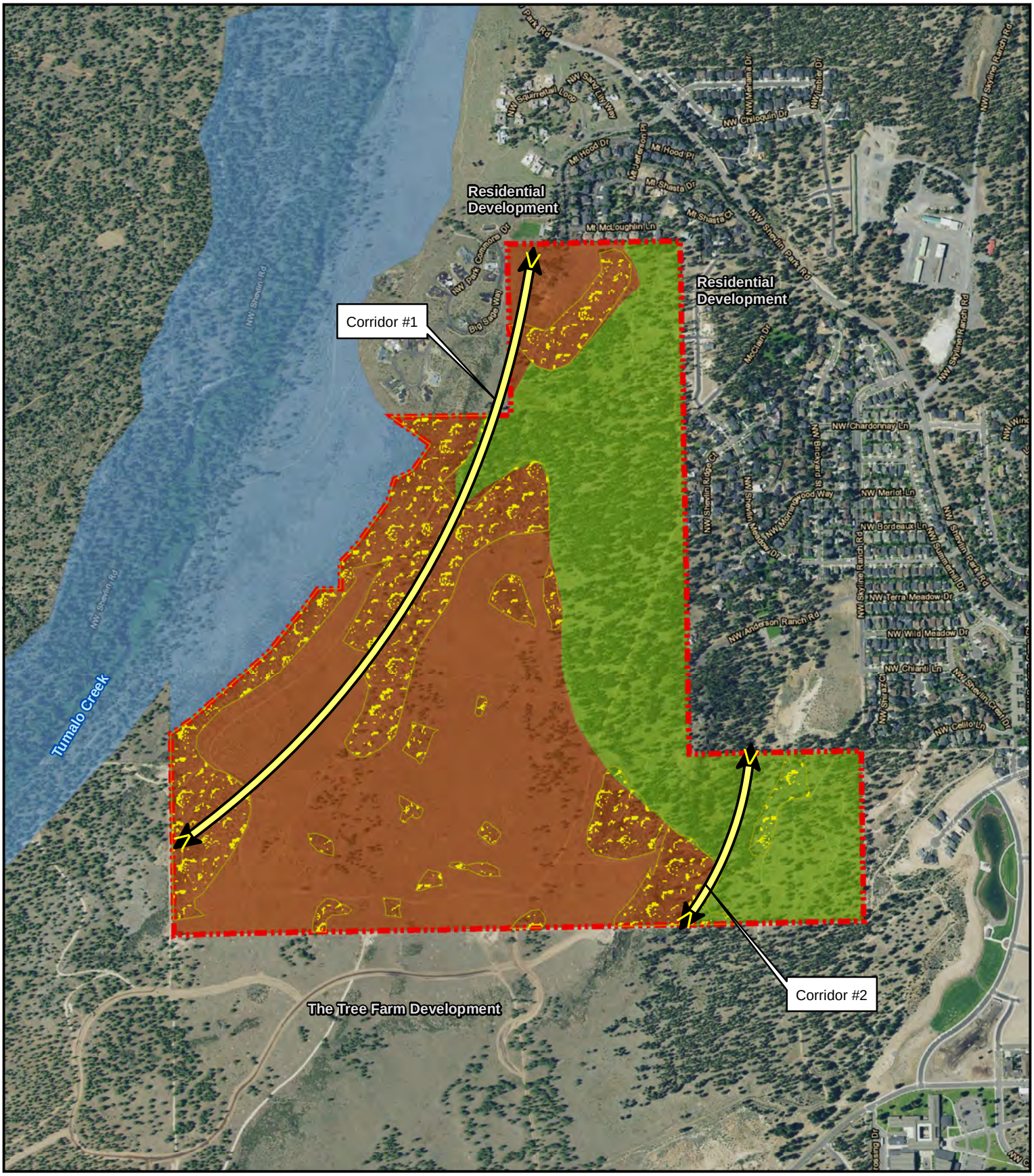

Figure 3.
Corridors and Forage Map

Rio Lobo Project
Deschutes County, Oregon

Project Study Area

Mule Deer Movement Pattern (Snapshot)

Winter Forage Patch

Ponderosa Pine Habitat

Shrub-Steppe Habitat

Shevlin Park

MB&G

Source: Aerial imagery from NAIP 2016, all other data from MB&G. Reproduced for informational purposes and may not be suitable for legal, engineering or surveying purposes. Conclusions drawn from such information are the responsibility of the user.

Feet
0 250 500 1,000

WMP_Figure3_Corridors, 12/19/2017

Development Plan

The proposed development includes a total of approximately 103 residential lots that would each be less than two-and-a-half acres in size. The development sets aside portions of the PSA including a conservation area, and a designated open space area which will be managed with some focus on the maintenance of wildlife habitat. These areas are indicated on the Preliminary Plan in Appendix A, and they include the conservation area along the western extent of the proposed development as well as the designated open space in the southeastern corner. There is also a no build zone along the eastern edge of the westernmost conservation area (see Preliminary Plan, Appendix A) that is designed to provide a buffer of defensible space between structures and the conservation area, as described in the Wildfire Mitigation and Forest Health Plan developed for this project (WMFHP 2017). The Preliminary Plan included in Appendix A is preliminary; however, the wildlife habitat conservation measures described in the following sections will be applied to the Westside Transect Zone area of the Preliminary Plan at each stage of its development to finalization; approximately 307 acres.

Integration of Wildlife Habitat Management with Wildfire Protection

Singletree Enterprises developed the WMFHP in conjunction with this WHMP in order to produce a comprehensive vegetation management plan that will reduce the threat of wildfire spread while also maintaining quality wildlife habitat within the conservation area, the designated open space area, and in the undeveloped portions of the residential lots. As explained in the WMFHP, vegetation will generally be managed in compliance with the National Fire Protection Association (NFPA) codes and defensible space standards which use a zone of protection approach. Vegetation treatments for Zones 1, 2, and 3 are defined in the WMFHP.

Vegetation management prescriptions that are intended to reduce the potential for wildfire can affect forage quality and quantity, as well as the associated cover effectiveness of wildlife habitat. After development, vegetation management on the PSA will include tree stand thinning, ladder fuel reduction (*e.g.* periodic removal of ground fuels and tree limbing), slash pile removal, and slope-specific treatments. The following provisions will be implemented to maintain wildlife habitat value within the context of the NFPA standards as described in the WMFHP.

Within open space, including the conservation area, and designated open space, and within lots beyond fire protection buffers associated with structures (*i.e.* outside of Zones 1 and 2, and within Zone 3, per the WMFHP):

- Downed logs: Downed logs will be left as a source of visual screening if they will not act as ladder fuel, per guidance provided in the WPMP. Where possible, retain an average of two downed logs per acre, consistent with the goals of adjacent Shevlin Park (Boldenow 2008).
- Standing snags (dead trees) provide food and nest site locations for wildlife, especially cavity nesting birds (Photo 1, Appendix B). Leave snags in place where practical. The density target for snags will be two of each per acre, consistent with the goals of adjacent Shevlin Park (Boldenow 2008).

- Brush: Leave patches of brush (Photos 4 and 10, Appendix B), especially those associated with rock outcrops. Most brush under the drip line of trees must be removed often enough to maintain a distance of at least three times the height of the ground fuel and the tree crown. In open areas, older and taller brush patches can be maintained and remain consistent with the fire protection guidelines (WMFHP).
    - Patches of brush will specifically be left within the conservation area along the western boundary of the PSA and opportunistically within other open spaces and building lots when also in compliance with the WMFHP (see current brush patch pattern in Figure 3).
    - Brush patches will be maintained in a mosaic pattern following a multi-year cycle of brushing so that brush patches will vary in age and height.
- Slope-specific brush treatments: Hand-pruning treatments will be used to maintain brush patches as wildlife habitat while also providing breaks in the linear continuity of brush patches oriented along steep slopes and rock outcrops; consistent with a fire fuels reduction practice (WMFHP).

Vegetation Management Standards and Wildlife Habitat

Application of the vegetation treatments described above will result in a landscape which continues to support deer and other wildlife species. In particular, maintenance of vegetation within the conservation area on the western edge of the development will maintain a north-south travel corridor adjacent to already protected lands along Tumalo Creek and within Shevlin Park. In addition, a mosaic of brush pockets and ponderosa pine cover associated with the designated open space area, and undeveloped portions of lots within Zone 3 will continue to provide patches of habitat and travel corridors for deer, elk, and other wildlife.

Treatments to steeper slopes represent a small proportion of the total acreage of brush and they will be implemented in a manner consistent with maintaining pockets of habitat for animals to continue utilizing as cover and forage. Therefore, the vegetation treatments on the sloped areas are not expected to significantly impact wildlife habitat beyond the management already occurring as a part of the proposed fuel reduction treatments.

The current land management treatments of brushing and thinning applied within the PSA result in a more open understory which mimics the effects of fire and also encourages the growth of forage species which deer in particular rely upon during the winter months. Forage will continue to be accessible in winter due to the maintenance of a ponderosa pine tree canopy throughout the eastern portion of the PSA which will reduce the depth of the snowpack relative to more open areas on deer and elk winter range (*e.g.* within the Awbrey Hall fire perimeter).

Wildlife Disturbance

Implementation of vegetation treatments will potentially disturb wildlife for short periods of time as workers move through areas to complete vegetation alteration. These activities will be short in

duration and similar to those practiced in the past on the PSA as well as on nearby lands including the Deschutes National Forest (United States Forest Service [USFS] 1990) and Shevlin Park (Boldenow 2008). In addition, vegetation management activities are likely to be performed in the fall or spring when the area is most accessible and not under fire restrictions; therefore the activities will likely occur outside of the deer winter range season.

Wildlife Habitat Conservation Measures

The PSA and proposed development are within ODFW biologically-defined mule deer and elk winter range as well as located adjacent to Deschutes County's wildlife area (WA) combining zone (Appendix A). Because the PSA is not located within the WA zone, development plans must only comply with the more general Deschutes County Code (DCC); however, the Project team voluntarily proposes to incorporate the following development design elements and conservation measures within the 307-acre Westside Transect Zone to protect wildlife habitat values, particularly those of deer winter range. These conservation measures are based on selected portions of the DCC 18.88 for WA combining zones, including DCC specific to cluster developments (18.128.200 B.3), and some originate from our ongoing coordination with ODFW. These Project-specific conservation measures also take into account the specific characteristics of the PSA and the surrounding landscape.

Post-development open space within the Westside Transect Zone, including the conservation area, the no build zone, the designated open space, and building lots beyond the fire protection buffers around structures (*i.e.* outside of Zones 1 and 2, and within Zone 3, per the WMFHP), will be managed for the maintenance of mule deer winter range, and wildlife habitat in general. Existing natural vegetation will be protected, preserved and enhanced to continue providing cover or shelter, food supply, and free movement. As part of the management of open space areas, specific wildlife habitat conservation measures targeted at protecting and enhancing the wildlife habitat include:

- Continued application of the vegetation management standards described earlier in this report. If more aggressive fuel reduction treatments become necessary within the conservation area, no build zone, or designated open space, their impacts to wildlife habitat will be re-assessed by a professional biologist and possible modifications designed to lessen the impacts of the proposed measures will be considered prior to their implementation (see monitoring plan requirement below).
- Vegetation will be monitored and weeds/non-native plants will be controlled and eradicated when possible and feasible following the recommendations of the Deschutes County Noxious Weed Board, or a similar body.
- Juniper trees will be removed when encountered within the open space areas during application of the fire fuels reduction practices outlined above to prevent competition with native shrub species that are preferred by deer.
- Live ponderosa pine trees will be preserved within the open space areas when feasible.
- Fire wood cutting or vegetation alteration beyond that prescribed as management for increased habitat value and fuels management will not be permitted within the open space areas.

- Livestock will not be kept or allowed on the property.
- To minimize the impact of domestic dogs on deer populations, leash laws will be posted and strictly enforced within the conservation area on the western portion of the development and the designated open space in the southeastern corner.
- No high-intensity recreational uses (*e.g.* playground, motorized trail use) will be allowed within the conservation area or the designated open space.
- The lots that are directly adjacent to the designated conservation area along Shevlin Park will observe the no build zone to create a defensible space (per the WMFHP) and also to protect the wildlife value of the adjacent conservation area.
- No new fences will be constructed within the conservation area along the western portion of the development or the designated open space in the southeastern corner. All fences installed on building lots will be constructed in compliance with WA zone fence standards (DCC 18.88.070) to prevent restriction of deer movement throughout the area.

    - ***Fence Standards (Utilizing DCC 18.88.070). The following fencing provisions shall apply as a condition of approval for any new fences constructed as a part of development of a property in conjunction with a conditional use permit or site plan review.***
        - ***New fences shall be designed to permit wildlife passage. The following standards and guidelines shall apply:***
            - ***The distance between the ground and the bottom strand or board of the fence shall be at least 15 inches.***
            - ***The height of the fence shall not exceed 48 inches above ground level.***
            - ***Smooth wire and wooden fences that allow passage of wildlife are preferred. Woven wire fences are discouraged.***

- The proposed development will prohibit the recreational use of off-road motor vehicles within the conservation area, the no build area, and the designated open space area. Motorized vehicle use in these areas will not be allowed except as needed for management or emergency fire vehicle access.
- Where existing or proposed roads intersect the conservation area, the no build zone, or the designated open space, there will be reduced speed signs and signage indicating wildlife crossings.
- As part of the post-development monitoring plan (see below), develop a program to educate residents and guests on the project's wildlife habitat maintenance goals and how they can reduce impacts to deer using open space as winter range.

Providing adequate wildlife passage through the development.

At a landscape level, the PSA is located on the eastern edge of the ODFW-designated deer winter range for the Tumalo herd (Appendix A). It is also identified as elk winter range (biologically). It does not fall within the Deschutes County WA zoned area which is the highest priority area for winter range protection. The nearest WA zoned area, which is designated for deer winter range, is located on the north side of Tumalo Creek to the north and west of the PSA and adjacent to the southwestern property boundary.

The conservation area proposed in the Preliminary Plan along the western edge of the PSA is designed to provide a minimally obstructed wildlife travel corridor, especially for deer and elk, that is contiguous with adjacent protected areas to the west of the development (the riparian zone of Tumalo Creek, Shevlin Park, and public lands farther to the west). In conjunction with other development plans and their associated open spaces located to the north and south of the PSA, this conservation area provides a key link in the landscape-level continuity of wildlife habitat maintained along Tumalo Creek. The corridor follows the natural topography of a ridge that parallels the creek, originating on the southwestern border with the WA zone, and gently dropping down in elevation toward the riparian zone of Tumalo Creek to the north-west of the PSA (Figure 4). According to ODFW biologists, deer migrating through the Bend area on an east-west path are already likely to avoid residentially developed areas, travelling instead along the southern border of the City; however, animals approaching the developed areas are likely to continue using contiguous corridors such as that along Tumalo Creek. Also, pockets of habitat maintained within developments, such as the designated open space indicated in the southeastern portion of the Preliminary Plan, will continue to provide forage and cover resources for resident deer, as well as other wildlife species (Corey Heath and Sara Gregory, ODFW Biologists, pers. comm., April 18, 2017).

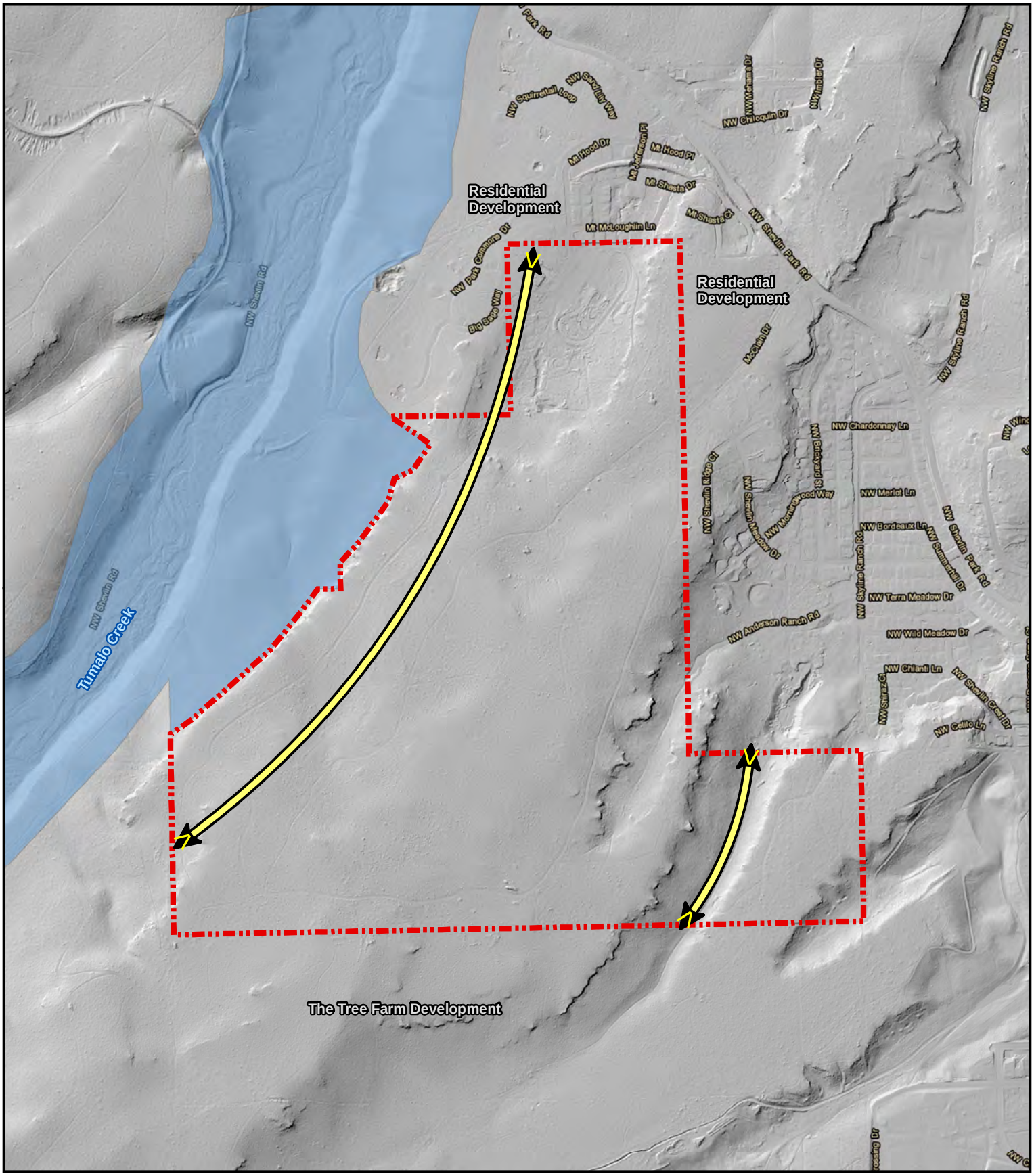

Figure 4.

Elevation Map

Rio Lobo Project
Deschutes County, Oregon

Project Study Area

Mule Deer Movement Pattern (Snapshot)

Shevlin Park

MB&G

Source: Hillshade from OLC, all other data from MB&G. Reproduced for informational purposes and may not be suitable for legal, engineering or surveying purposes. Conclusions drawn from such information are the responsibility of the user.

0 250 500 1,000 Feet

WMP_Figure4_Elevation_v2, 12/19/2017

Implementation, Monitoring, and Enforcement of the Wildlife Habitat Conservation Measures

Within the 307-acre Westside Transect Zone on the PSA, the developer will implement these wildlife habitat conservation measures and will be responsible for monitoring and enforcing adherence with these measures until management is turned over to the Home Owners Association (HOA). The transfer of management from the developer to the HOA is expected to occur once all property has been conveyed or sold to persons or entities other than the developer or 15 years after the conveyance of the first home site or at an earlier time at the discretion of the developer. Throughout development and once management is transferred to the HOA, there will be three avenues for continued implementation, monitoring, and enforcement of the wildlife habitat conservation measures:

1) Wildlife habitat conservation measures will be incorporated into the Declaration of Covenants, Conditions, and Restrictions (CC&Rs), therefore the HOA will have ultimate authority to assess a fine or fee if an owner is non-compliant and the HOA will have the ability to bring the property into compliance should an owner continue failing to comply.

2) There will be a provision in the CC&Rs for a professional biologist to conduct an audit of the compliance of the developer or HOA (the managing party, as determined by the status of land management responsibility at the time of the audit) with this WHMP. This audit would be performed every 3 to 5 years starting from inception of ground-breaking activities associated with the development. The expected deliverable would be a monitoring report assessing the implementation and effectiveness of the above Wildlife Habitat Conservation Measures and proposing potential adaptive management actions to address any issues detected during the audit. Under no circumstances would the measures outlined in this plan be reduced through this audit process.

3) The managing party (the developer or the HOA, depending on the status of land management responsibility) is required to meet County Code and abide by the land use decision.

Costs associated with implementing, monitoring, and enforcing the wildlife habitat conservation measures in this plan will be covered by the developer until management is transferred to the HOA. At that time the expenses will become a part of the HOA annual budget.

Summary and Opinion

The habitat types and evidence of use of the PSA by deer and elk observed by MB&G during the field investigation indicate a general pattern of use that is consistent with the designation of the entire area within the PSA as mule deer and elk winter range habitat. The Preliminary Plan for the proposed project was developed while considering impacts to the wildlife habitat present within the PSA. The development of this WHMP and revisions made to the Preliminary Plan in

response to the findings of this report are in excess of Deschutes County's requirements for developments. These efforts indicate a recognition on the part of the project team with respect to this important habitat value and the desire to maintain its function. Furthermore, this project considers a landscape-level approach to maintaining wildlife habitat connectivity as development occurs on the west side of the City.

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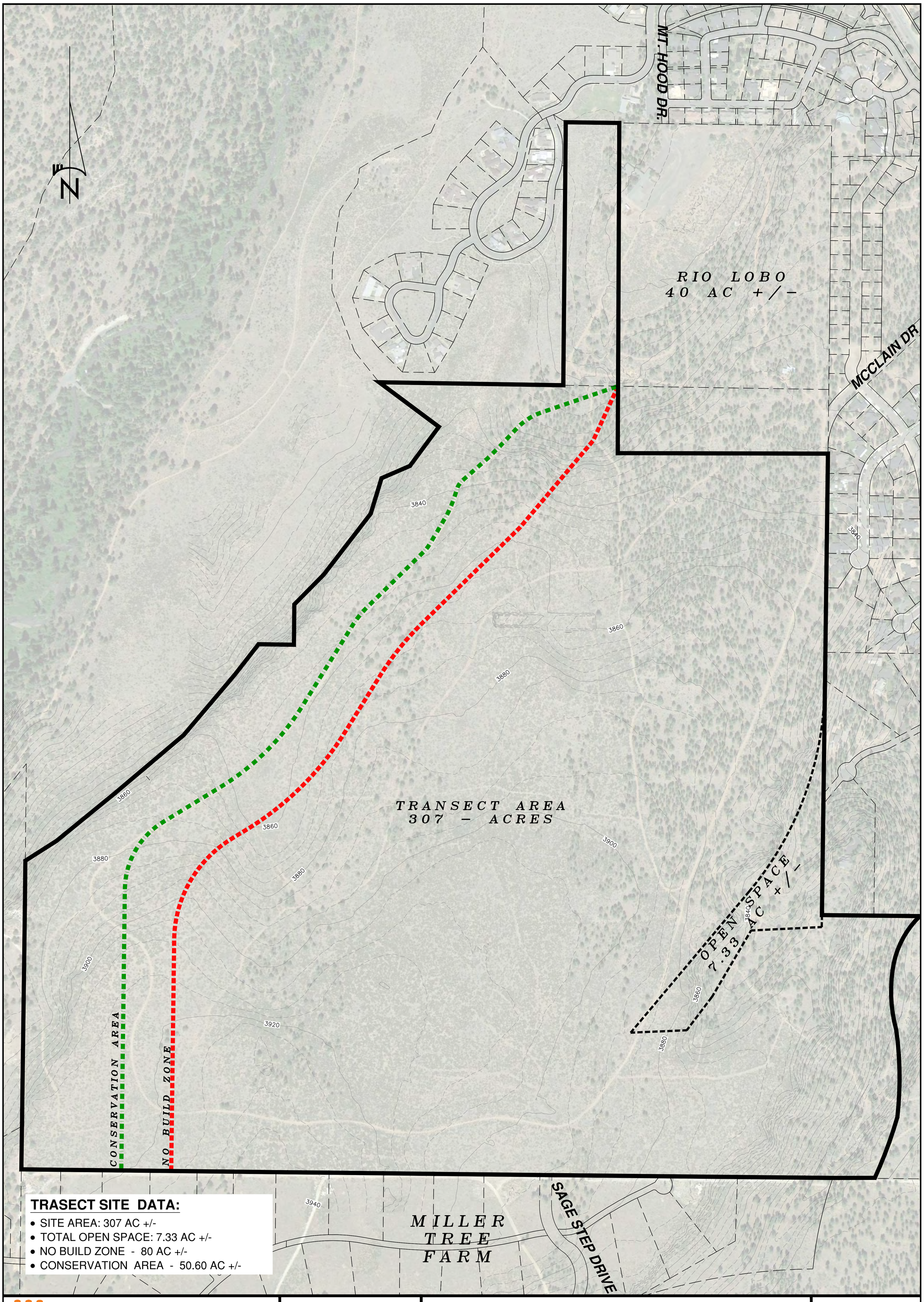
Appendix A

Preliminary Plan
Mule Deer and Elk Winter Range Project Overlap Figure



TRASECT SITE DATA:

- SITE AREA: 307 AC +/-
- TOTAL OPEN SPACE: 7.33 AC +/-
- NO BUILD ZONE - 80 AC +/-
- CONSERVATION AREA - 50.60 AC +/-

BECON
Civil Engineering & Land Surveying
549 SW MILL VIEW WAY
SUITE 105
BEND, OREGON 97702
(541) 633-3140
www.beconeng.com

FOR:

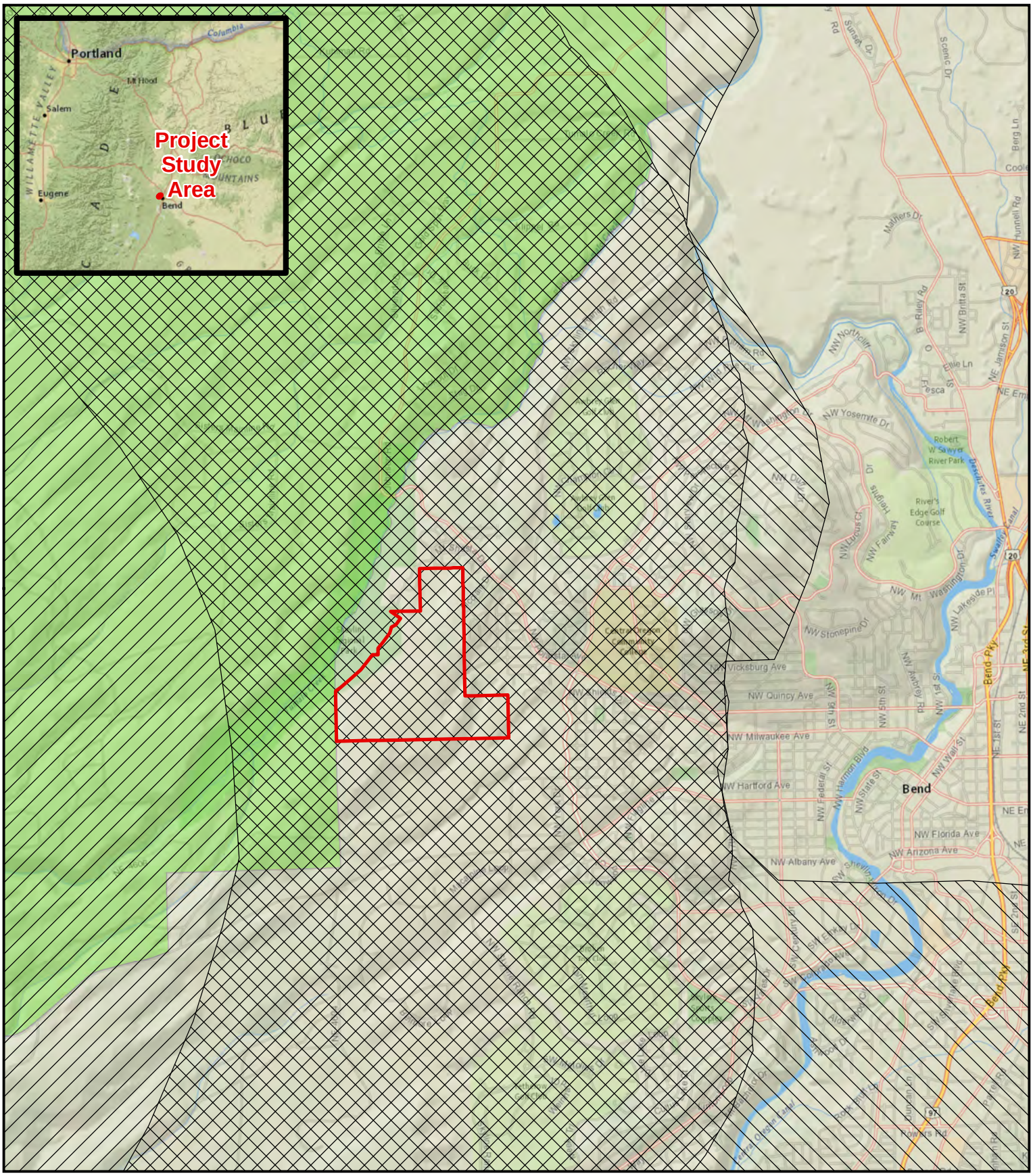
KEVIN
SPENCER

RIO LOBO - TRANSECT AREA
PRELIMINARY SITE LAYOUT
DESCHUTES COUNTY, OREGON

DATE: 12/18/2017 | SCALE: 1" = 400' | DRAWN BY: JLB | PROJ: 13861

SHEET 1 OF 1

REGISTERED PROFESSIONAL ENGINEER
OREGON
DEC. 31, 2007
JEFF J. HUFFMAN
RENEWS: JUNE 30, 2017
PRELIMINARY



ODFW Mule Deer and Elk Winter Range

Rio Lobo Project
Deschutes County, Oregon

- Project Study Area (PSA)
- ODFW Mule Deer Winter Range
- ODFW Elk Winter Range
- Deschutes County WA Combining Zone (Mule Deer Tumalo Herd)

MB&G

Source: Base map from National Geographic, all other data from MB&G, Deschutes County, and ODFW. Reproduced for informational purposes and may not be suitable for legal, engineering or surveying purposes. Conclusions drawn from such information are the responsibility of the user.

Feet
0 2,000 4,000

WinterRange, 4/7/2017

Appendix B

Project Photos

1

2

MB&G	**Wildlife Habitat Management Plan** **Rio Lobo Project** **Deschutes County, Oregon**
Mason, Bruce & Girard, Inc. Photo Date March 15, 2017	1. View to the south of the Ponderosa Pine habitat type from observation point 20. Note the thinning and limbing management treatments. Snags like the one shown in the background provide valuable habitat for a multitude of wildlife species. 2. View to the west from observation point 3 of the Ponderosa Pine habitat type. This photo demonstrates the removal of western juniper as well as thinning activity.

3

4

MB&G	**Wildlife Habitat Management Plan** **Rio Lobo Project** **Deschutes County, Oregon**
Mason, Bruce & Girard, Inc. Photo Dates December 15, 2016 and March 15, 2017	3. View to the west of Shrub-Steppe habitat from observation point 17. Note the mature to decadent forage species (antelope bitterbrush, manzanita, and rabbitbrush) available to ungulates during significant snow events (18-24" of snow). 4. The same photo taken three months later after snow melt.

5

6

MB&G	**Wildlife Habitat Management Plan** **Rio Lobo Project** **Deschutes County, Oregon**
Mason, Bruce & Girard, Inc. Photo Date March 15, 2017	5. Photo to the south from observation point 11 of the Shrub-Steppe habitat type. This photo shows bunch grasses dominating the landscape. 6. View to the west from observation point 10 of the Shrub-Steppe habitat type. Note the sparse pine trees and brush patches providing potential cover and bedding to ungulates.

7

8

MB&G	**Wildlife Habitat Management Plan** **Rio Lobo Project** **Deschutes County, Oregon**
Mason, Bruce & Girard, Inc. Photo Date March 15, 2017	7. Photo taken near observation point 2 of deer scat and tracks as well as a rub on a manzanita shrub. 8. Elk scat from multiple animals near observation point 19.

9

10

MB&G	**Wildlife Habitat Management Plan** **Rio Lobo Project** **Deschutes County, Oregon**
Mason, Bruce & Girard, Inc. Photo Date March 15, 2017	9. View to the southwest of elk tracks (photo taken near observation point 5). 10. View to the southwest of the dry draw in the southeast corner of the PSA. Rock outcrops such as the one shown in the background and associated brush serve as key habitat patches for ungulate and other wildlife species.