



CLEAN WATER SERVICES  
NATURAL RESOURCE ASSESSMENT  
WEST HILLS DEVELOPMENT:  
SOUTH COOPER MOUNTAIN HEIGHTS PROPERTY

**Prepared for**

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## LIST OF ACRONYMS AND ABBREVIATIONS

CWS	Clean Water Services
DSL	Oregon Department of State Lands
HGM	Oregon Hydrogeomorphic Classification System
HUC	hydrologic unit code
LWI	Local Wetland Inventory
NAVD 88	North American Vertical Datum of 1988
NRA	natural resources assessment
PEM	palustrine emergent
PFO	palustrine forested
PSS	palustrine scrub-shrub
R&O 07-20	Design and Construction Standards for Sanitary Sewer and Surface Water Management
USACE	U.S. Army Corps of Engineers



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## 1 INTRODUCTION

Anchor QEA, LLC, was retained by West Hills Development to perform a natural resources assessment (NRA) for the South Cooper Mountain Heights project (Crescent Grove and Dyches Properties; Site) in preparation for future residential housing developments on the properties. The Site is located in unincorporated Washington County, Oregon (Figures 1, 2, and 3a-3q).

**City/County/State:** Beaverton, Washington County, Oregon  
**General Location:** Northeast of the intersection of Scholls Ferry Road and east of 175th Ave.  
**Tax Lots:** 2S1060000200 (South Cooper Mountain Crescent Grove Property)  
2S1060000103 (Dyches Property)  
**Latitude/Longitude:** 45.42982 / -122.854313 (South Cooper Mountain Crescent Grove Property)  
45.43058 / -122.849508 (Dyches Property)  
**PLSS:** Section 6 T2S R1W  
**Street Address:** No street address; lots are agricultural/undeveloped  
**Approximate Area:** 54.85 acres (South Cooper Mountain Crescent Grove Property)  
54.43 acres (Dyches Property)  
**Zoning:** AF-20 (South Cooper Mountain Crescent Grove Property)  
AF-20 (Dyches Property)

This NRA is prepared in accordance with the requirements of Chapter 3 of Clean Water Services' (CWS') June 2007 *Design and Construction Standards for Sanitary Sewer and Surface Water Management* (CWS 2007), which is hereafter referred to as R&O 07-20. As required by Section 3.02.2 of R&O 07-20, this report includes a Tier 2 Site Assessment.

In accordance with Section 3.013.3 of R&O 07-20, the following information is provided:

- A Sensitive Areas Certification form
- A description of the existing site, Sensitive Areas, and Vegetated Corridor condition on and within 200 feet of the project site

- The determination, mapping, and a description of each plant community within vegetated corridors
- A determination of potential project encroachments into sensitive areas and associated vegetated corridors both on and within 200 feet of the project site
- Wetland (prepared in accordance with the Oregon Department of State Lands [DSL] and U.S. Army Corps of Engineers [USACE] procedures for wetland delineation and R&O 07-20 Section 3.14) and Vegetated Corridor Sample Points
- A figure set with the following figures:
  - Site location, project vicinity map, and tax lot map
  - Existing condition figure
  - Proposed development figure
  - Water quality sensitive areas, vegetated corridor, and plant communities figure

In accordance with Section 3.07.4 of R&O 07-20 and as required for submission of a Tier 2 assessment, the following additional information is provided:

- A description of why the encroachment is needed including rejected alternatives that would result in less encroachment.

A Functional Analysis Report was not included due to avoidance of impacts to all water quality sensitive areas on site.

This report documents the investigation, best professional judgment, and conclusions of Anchor QEA. It should be used for planning purposes only until verified in writing by CWS through the issuance of a Service Provider Letter.

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## **2 PROJECT DESCRIPTION**

The project will provide 644 total housing units within the South Cooper Mountain plan area of Washington County, Oregon, to meet projected housing demand in this area at a density consistent with zoning designations. The proposed development summary includes 270 multi-family homes, 101 townhomes, and 273 single-family homes.

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### **3 GENERAL SITE DESCRIPTION**

The Site is situated in the Prairie Terraces sub-region of the Willamette Valley ecoregion (Thorson et al. 2003) and is located in the foothills of the Tualatin Mountains. It is bounded to the west by SW 175th Avenue and to the south by SW Scholls Ferry Road. To the east are urban residential housing developments, to the north rural residential properties, and to the south and west the land remains agricultural. Topography slopes downward from north (elevation of 480 feet North American Vertical Datum of 1988 [NAVD 88]) to south (elevation of 300 feet NAVD 88; USGS 2011; Figure 4). Hydrologically, the northwest corner of the Site is in the Rock Creek sub-watershed (hydrologic unit code [HUC] 170900100503) of the Tualatin River sub-basin of the Willamette River Basin and remainder of the Site is in the Fanno Creek sub-watershed (HUC 170900100502; Oregon State University 2015).

#### **3.1 Existing Site Conditions**

##### **3.1.1 Site Location**

The Site is located directly north of SW Scholls Ferry Road, approximately 475 feet south of SW Alvord Lane, and directly east of SW 175th Avenue, and is within the City of Beaverton urban growth boundary South Cooper Mountain interim annexation area.

##### **3.1.2 Current Site Description**

The western portion of the Site (tax lot 2S1060000200) is actively used for agricultural crop production and is currently planted in clover. The northeastern third of tax lot 2S1060000200 is unmanaged scrub-shrub forest with grassland interspersions. The eastern portion of the Site (tax lot 2S1060000103) was recently logged (within the past five years), except for the southern quarter and far northeast edge of the Site. There are no structures or residences within the Site boundary.

##### **3.1.3 Surrounding Land Use**

Land use surrounding the Site is a mixture of agriculture, rural residential and urban residential housing developments.

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## **4 NATURAL RESOURCE ASSESSMENT**

This NRA is prepared in compliance with Chapter 3 of the R&O 07-20. Vegetated corridor conditions and buffer widths were determined in accordance with the Chapter. Corridor conditions were determined by assessing and rating different plant communities as good, marginal, or degraded using CWS standards.

### **4.1 Delineation of Water Quality Sensitive Areas**

Separate wetland delineations were performed on the site by Anchor QEA and AKS Engineering and submitted to DSL for verification. As a result, wetland identifiers in delineation reports specify wetlands according to the tax lot parcel where they were identified and delineated. For the purposes of the CWS water quality sensitive area assessment and the permitting of the project site which spans both tax lots, the water quality sensitive areas are combined (Figure 6).

Six water quality sensitive areas (Wetlands A through E and a drainage channel) were delineated on the South Cooper Mountain Crescent Grove Property (tax lot 2S1060000200) and two water quality sensitive areas (Wetland F and a separate drainage channel) were delineated on the South Cooper Mountain Dyches Property (tax lot 2S1060000103). Wetland A on the Crescent Grove Property also contains portions of a north-south agricultural drainage channel /creek. Table 1 summarizes the water quality sensitive area acreages and classifications on the project site.

**Table 1**  
**Water Quality Sensitive Areas Identified on the Project Site**

Water Quality Sensitive Area	Cowardin Classification <sup>1</sup>	HGM Classification <sup>2</sup>	CWS Water Quality Sensitive Area	Size (acres)
Wetland A <sup>3</sup>	PFO/PSS/PEM	Slope/Flats	Yes	2.34
Drainage Feature (outside wetland)	Intermittent	RFT	Yes	0.01 <sup>3</sup>
Wetland B	PEM	Flats	Yes	0.17
Wetland C	PEM	Flats	Yes	0.17
Wetland D	PEM	Flats	Yes	0.02
Wetland E	PEM	Flats	Yes	0.05
Wetland F (Dyches)	PSS	Slope/flats	Yes	8.36
Dyches drainage	Intermittent	RFT	Yes	0.06
<b>Total Water Quality Sensitive Area Acreage On site</b>				<b>11.19</b>

## Notes:

1. Based on U.S. Fish and Wildlife Service/Oregon Hydrogeomorphic classification systems (Cowardin et al. 1979)
2. Based on HGM Classification system (Adamus 2001)
3. Portions of the drainage feature on the South Cooper Mountain Crescent Grove Property and noted in Section 4.1 are contained within the boundaries of Wetland A and therefore absorbed within the buffer of that feature. Acreage shown is for portions of the drainage feature that are outside the boundary of Wetland A.

CWS = Clean Water Services

HGM = Oregon Hydrogeomorphic Classification System

PEM = palustrine emergent

PFO = palustrine forested

PSS = palustrine scrub-shrub

RFT = Riverine Flow-through

On the South Cooper Mountain Crescent Grove Property (tax lot 2S1060000200), field visits were performed for wetland data on October 24, 27, 28, November 4, 17, 2014, and January 13, 26, 27, 2015. Data were collected in accordance with DSL and USACE procedures for wetland delineations. Boundaries and data plot locations were staked in the field and professionally land surveyed by Otak, Inc., to accuracy of 0.1 foot and then plotted on a base map using AutoCAD. This wetland delineation report is included in Appendix A.

Two water quality sensitive areas (one wetland and one non-wetland intermittent waterway) were delineated on the Dyches Property (tax lot 2S1060000103) by AKS Engineering & Forestry, LLC. A field visit was performed for wetland data on November 5, 2014. The delineated wetland and non-wetland waters (drainage channel) are considered water quality sensitive areas. Boundaries and data plot locations were staked in the field and professionally

land surveyed by AKS Engineering & Forestry. This wetland delineation report is included in Appendix B.

#### **4.1.1 Description of Water Quality Sensitive Area: Wetland A**

Wetland A is a 2.34-acre combination of palustrine forested (PFO)/ palustrine scrub-shrub (PSS)/palustrine emergent (PEM) wetlands associated with the narrow agricultural drainage channel flowing from north to south through the center of the project site. It is classified as a combination PFO/PSS/PEM wetland under the U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and as a slope/flats wetland under HGM (Adamus 2001). It is primarily a PFO wetland surrounding a drainage feature with PSS areas bounding the outer edges of the riparian zone. Intermixed within the scrub-shrub areas and continuing upslope to the east in places away from the drainage feature are PEM portions of wetland that are grass and forb dominated.

The northernmost triangular-shaped portion of this wetland is a PEM wetland composed of grass species; quackgrass (*Agropyron repens*), meadow foxtail (*Alopecurus pratensis*), tall fescue (*Festuca arundinacea*), red fescue (*Festuca rubra*), and bentgrasses (*Agrostis* sp.) with forested and scrub shrub areas along the margin. The shape is dictated by two small drainages that converge and continue in a southerly direction. In the forested area, which is limited to a narrow 3 to 4 meter riparian zone adjacent to the drainage, Oregon ash (*Fraxinus latifolia*) is the dominant species with various age class recruitment spreading upslope to the east in places; willows (*Salix* sp.) and western crabapple (*Malus fusca*) are also present to a lesser degree and scattered throughout. The understory is poorly developed with high percentages of bare ground. The PSS portions of this wetland are dominated by common hawthorn (*Crataegus monogyna*), roses (*Rosa nutkana* and *eglantaria*) and Douglas spiraea (*Spiraea douglasii*) with Oregon ash saplings also present.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, Wetland A is classified as a CWS water quality sensitive area.

#### **4.1.2 Description of Water Quality Sensitive Area: Crescent Grove Drainage Feature**

There is a narrow (less than one meter wide), incised agricultural drainage channel running the length of the Site (Figure 6). The majority of this feature is contained within Wetland A boundaries and included in the wetland acreage calculated for the site. The drainage channel continues south of Wetland A along the east boundary of the tax lot and is associated with a farmed wetland (Wetland C) directly west of the channel.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, the drainage channel is classified as a CWS water quality sensitive area, but the portion that is contained within Wetland A is not calculated separately because it is contained within the wetland boundary.

#### **4.1.3 Description of Water Quality Sensitive Area: Wetland B**

Wetland B is a small, depressional farmed wetland located on the west side of the agriculture field at the toe of the road prism running along SW 175th Avenue. It was identified based on aerial photographs but lacks any naturally occurring vegetation and subsequently delineated based on soils, hydrology, and crop stress.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, Wetland B is classified as a CWS water quality sensitive area.

#### **4.1.4 Description of Water Quality Sensitive Area: Wetlands C, D, and E**

Wetlands C, D, and E are three small depressional farmed wetlands along the eastern boundary of the Site at the toe of the agriculture field slope. All of these lack naturally occurring vegetation but were identified based on aerial photographs and subsequently delineated based on soils, hydrology, and crop stress. Wetland C is adjacent to the drainage channel flowing from north to south through the center of the project site. Wetland D is within a small depressional area located slightly further into the agriculture field to the south and west of Wetland C. Wetland E is also along the east property boundary in the vicinity drain tile that conveys water to an open channel along the boundary (Appendix A).

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, the Wetlands C, D, and E are classified as CWS water quality sensitive areas.

#### **4.1.5 Description of Water Quality Sensitive Area: Wetland F**

The wetland delineated on the Dyches Property (Wetland F) is an 8.36-acre PSS wetland located in the western and southern portions of the tax lot. It is a wetland that is classified as a seasonally saturated PSS wetland under the U.S. Fish and Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and as a slope/flats wetland under the Oregon Hydrogeomorphic (HGM) Classification System (Adamus 2001). Seasonal drainage patterns within the southern portion of the wetland flow east and off site.

Vegetation within the recently logged portions of the wetland consisted mainly of non-native grasses with intermittent soft rush (*Juncus effuses*) and Oregon ash (*Fraxinus latifolia*) seedlings. The remainder of the scrub-shrub wetland was dominated by Oregon ash, black hawthorn, Douglas spiraea, soft rush, common velvetgrass (*Holcus lanatus*), slough sedge (*Carex obnupta*), and reed canarygrass (*Phalaris arundinacea*).

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, the Dyches wetland is classified as a CWS water quality sensitive area.

#### **4.1.6 Description of Water Quality Sensitive Area: Dyches Drainage Channel**

One non-wetland waters was delineated in the northeast portion of the Dyches Property. The drainage enters the property from the north and flows south in an approximately 1-foot-wide channel that is surrounded by a riparian plant community. Shallow continuous flow was observed in portions of the channel during the November 5, 2014, site visit by AKS Engineering & Forestry.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, the drainage channel is classified as a CWS water quality sensitive area.

## 4.2 Vegetated Corridor Width Determinations

Using Table 3-1 from Chapter 3 of the R&O 07-20, the vegetated corridor widths were determined to be 50 feet from the edge of the water quality sensitive area boundary. Table 2 summarizes criteria used to determine vegetated corridor widths and subsequent acreage calculations.

**Table 2**  
**Vegetated Corridor Calculations**

Water Quality Sensitive Area	Slope	Greater Than 0.5 Acre	Isolated	Connected to water quality sensitive areas off site	Buffer Zone Calculation (feet)	Vegetated Corridor Buffer Calculation (acres)
Wetland A <sup>3</sup>	<25%	Yes	No	Yes	50	3.95
Drainage Feature	<25%	n/a	No	Yes	50	n/a
Wetland B	<25%	No	No	Yes	50	0.74
Wetland C	<25%	No	No	Yes	50	0.82
Wetland D	<25%	No	No	Yes	50	0.30
Wetland E	<25%	No	No	Yes	50	0.63
Wetland F (Dyches)	<25%	Yes	No	Yes	50	3.55
Dyches stream	<25%	No	No	Yes	50	3.03
<b>Total on-site vegetated corridors</b>						<b>13.02</b>

## 4.3 Determination of Water Quality Sensitive Areas within 200 Feet of the Project Site

Due to access restrictions of the remaining adjacent properties, other water quality sensitive areas (wetlands, springs, streams, or ponds) within 200 feet of the Site were assessed based only on aerial imagery and by using other available resources (National Wetland Inventory, City of Beaverton South Cooper Mountain Annexation Area Draft Local Wetland Inventory [LWI], Washington County Significant Natural Resources Inventory Map, and Google Earth Imagery) but were not delineated, confirmed, or surveyed.

Water quality sensitive areas were identified west of 175th Avenue across the road from Wetland B. No other water quality sensitive areas were identified within 200 feet of the South Cooper Mountain Crescent Grove Property and Dyches Property boundaries.

#### 4.4 Buffer Zone Vegetative Communities

Four categories of vegetated buffer plant communities were identified on site; degraded agricultural, degraded scrub-shrub, degraded grassland, and good riparian forest (Figure 6). Vegetated corridor field data sheets are contained in Appendix C. Table 3 shows the acreages of the four buffer zone plant communities associated with the water quality sensitive areas on site and the CWS ratings associated with each; photographs are contained in Appendix D.

**Table 3**  
**Vegetated Corridor Acreages By Plant Community Type**

Buffer Zone Plant Community	Buffer Acreage	CWS Rating	Location
Agriculture	4.93	Degraded	West boundary of Crescent Grove Wetlands A, C, D, and E; East boundary of Crescent Grove Wetland B
Scrub-shrub	1.79	Degraded	Eastern boundary of Wetland A
Grassland	3.56	Degraded	Boundary of Dyches Wetland and Boundary of Dyches Drainage Channel
Riparian forest	2.74	Good	Dyches Drainage Channel
<b>Total</b>	<b>13.02</b>		

Note: CWS = Clean Water Services

##### 4.4.1 Degraded Agriculture

The degraded agriculture plant community contains no natural vegetation and no overstory trees, shrubs, or canopy. The agriculture plant community, at the time of this assessment, consisted of a cover crop species (*Trifolium* sp.).

##### 4.4.2 Degraded Scrub-shrub

The degraded scrub-shrub plant community follows the eastern boundary of Wetland A. It is dominated by common hawthorn, Himalayan blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*), English holly (*Ilex aquifolium*), areas of Oregon ash (*Fraxinus*

*latifolia*), red alder (*Alnus rubra*), and trailing blackberry (*Rubus ursinus*). The herb layer is comprised mainly of poa species and other various graminoids, sword fern (*Polystichum munitum*), Queen Anne's lace (*Daucus carota*), common tansy (*Tanacetum vulgare*), horseweed (*Conyza canadensis*), *Vicia* sp., and other weedy upland plants. The area lacks 25% canopy enclosure but possesses reasonable plant densities in both shrub and herb strata with 100% ground cover. It is rated as degraded due to lack of mature established over story trees and native plant cover. Due to the established plant densities in this area, many plants will be preserved and the area will be infill planted for enhancement.

#### **4.4.3 Degraded Grassland**

The degraded grassland plant community borders Wetland F (Dyches Property) and portions of the Dyches drainage channel and is located in an area that was recently logged. The community consists mainly of non-native grasses with interspersed soft rush, curly dock (*Rumex crispus*), fireweed (*Chamerion angustifolium*), and *Vicia* sp. It is rated as degraded due to lack of mature established overstory trees and native plant cover.

#### **4.4.4 Riparian Forest**

The riparian forest plant community bordering the delineated drainage channel in the northeast portion of the Dyches Property was left largely intact when the property was recently logged. Google Earth shows this riparian community varying in width from approximately 50 to 150 feet along the majority of length of the drainage channel. The overstory and shrub layer consists of Douglas fir (*Pseudotsuga menziesii*), bigleaf maple (*Acer macrophyllum*), and Oregon white oak (*Quercus garryana*) trees with oceanspray (*Holodiscus discolor*) and vine maple (*Acer circinatum*). Common in the herb layer are sword fern, Himalayan blackberry, and trailing blackberry (*Rubus ursinus*).

Recent aerial imagery also shows an unimproved access road crossing the northern section of the riparian forest. Areas impacted by the access road are rated as degraded, whereas the remainder of the vegetated buffer is rated as good based on data obtained from the AKS Engineering & Forestry drainage channel delineation.

## 5 PROPOSED ENCROACHMENTS AND IMPACTS TO VEGETATED BUFFERS

A total of 43,473 square feet (0.998 acre) of vegetated buffer will be impacted during the site development. Impacts are both temporary (2,527 square feet; enhanced through re-planting) and permanent (40,946 square feet; subject to mitigation through on-site creation of additional vegetated buffers or preservation of additional existing areas already in good condition). Temporary impacts are associated with construction activities and will be mitigated by replanting the impacted area to a trajectory to good condition.

A summary of impacts by each water quality sensitive area and impact type is contained in Table 4. Proposed impacts are shown in Figures 5a-5q and enhancements for encroachments and impacts are discussed in Section 7.

**Table 4**  
**Vegetated Buffer Impact Area Calculations**

<b>Water Quality Sensitive Area</b>	<b>Temporary Impact to Associated VC<sup>1</sup> (acreage)</b>	<b>Permanent Impact to Associated VC<sup>2</sup> Total (acreage)</b>	<b>Total Impacts to VC (acreage)</b>
Wetland A	0.037	0.272	0.309
Wetland B	n/a	0.012	0.012
Wetland C	0.018	0.002	0.021
Wetland F (Dyches)	0.003	0.474	0.477
Dyches stream	n/a	0.180	0.180
<b>Total</b>	<b>0.058</b>	<b>0.940</b>	<b>0.998</b>

Notes:

1. Temporary impacts will be treated as degraded and planted using full CWS calculations.
2. Permanent impacts will be mitigated on site.

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## 6 ALTERNATIVES ANALYSIS

All impacts to water quality sensitive areas have been avoided. In addition, impacts to vegetated corridors have been avoided as much as possible and where unavoidable, have been minimized. All vegetated corridor impacts are in vegetated corridors that are rated as degraded with the exception of the impacts associated with the crossing on the eastern most drainage on the Dyches Property. Those impacts are unavoidable and dictated by the existing right-of-way location which requires the road to be placed in the location shown. There is no other location that would not impact existing houses. The remaining impacts are to degraded vegetated corridors and were minimized in the following ways.

The road crossing on the Crescent Grove property was placed in a way to minimize impacts by crossing at a narrow point in the drainage way. The water quality sensitive area will be completely avoided by a bridge that will span the drainage area and associated wetlands. The placement of the road was partially dictated by a safe turning radius; however, the road was able to be placed in an area that will not require any tree removal and is currently in a degraded state.

The layout of the roads and housing densities also necessitate additional impacts to degraded buffer. The required green space and park requirement dictated some of the road locations because the roads need to avoid those areas. Roads were placed following County requirements including turning radius and emergency vehicle access. Additionally, required density for the site and the type of homes required by zoning designations resulted in the current layout.

Other layouts were considered, primarily that had greater impacts to both water quality sensitive areas and vegetated corridors. Those were rejected due to the current configuration being able to avoid the water quality sensitive areas and still meet the applicant's goals for the project.

Alternatives with less impacts were also evaluated, but did not meet the density and zoning requirements of the project. They were also not financially feasible for the applicant.

## 7 PROPOSED ON-SITE MITIGATION OF VEGETATED BUFFERS

On-site mitigation is proposed for permanent impacts to existing vegetated buffers at a 1:1 ratio. Mitigation areas are shown in Figure 6. On-site vegetated buffers that are rated as degraded will be planted at full CWS planting densities of 0.01 trees per square foot and 0.05 shrub per square foot. Table 6 shows the mitigation area acreages and strategies for implementation.

**Table 6**  
**Mitigation Area Calculations**

<b>Water Quality Sensitive Area</b>	<b>Associated VC Mitigation Area (acreage)</b>	<b>CWS Rating</b>	<b>Mitigation Strategy</b>
Wetland A	0.548	Degraded	Enhance
Wetland F (Dyches)	0.430	Degraded	Enhance
<b>Total</b>	<b>0.978</b>		

Note:

1. Mitigation impacts are for permanent loss as a result of buffer impacts, and calculations do not include temporary impacts, which will be restored.

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## 8 VEGETATED CORRIDOR ENHANCEMENT

Degraded vegetated corridors will be enhanced through planting to provide a vegetated corridor with sufficient planting diversity and density to place it on a trajectory to a good rating under CWS R&O 07-20 criteria. Enhancement planting acreages are summarized in Table 7.

**Table 7**  
**Enhancement Planting Area Calculations**

Description	Planting Requirement	Enhancement Planting Area (acre)
Vegetated Corridors	Enhancement	13.02
Temporary Impacts	Replacement	0.058
On-site Mitigation	Enhancement	0.978
<b>Total</b>		14.056

### 8.1.1 Site Preparation

Invasive and non-native species will be mowed, and follow-up herbicide will be applied as needed to eradicate any surviving invasive plants. Herbicide spraying will occur only under windless conditions by licensed applicators, and shields will be used to protect adjacent woody plants from overspray or drift.

Site preparation for the planting of native species will include initial mowing and scalping to reduce vegetative competition and improve planting effectiveness and herbicide application. Any bare ground exposed during Site preparation will be seeded with Pro Time Lawn Seed CWS specified *Clean Water Dry Area* at a composition similar to Table 8 or standard seed mix composition to promote re-establishment of the herbaceous layer and minimize the potential for erosion. The seeding, along with natural volunteers, will provide additional species diversity and density and provide competition to help exclude re-colonization by invasive species.

**Table 8**  
**Species Proposed for Seeding in the Prepared Vegetated Corridors**

Common Name	Scientific Name	Seed Mix (%)	Type of Planted Material
Blue wildrye	<i>Elymus glaucus</i>	30	Seed
Red native fescue	<i>Festuca rubra</i>	40	Seed
California brome	<i>Bromus carinatus</i>	15	Seed
Large leaf lupine	<i>Lupinus polyphyllus</i>	15	Seed

### 8.1.2 Proposed Enhancement Planting Plan

This planting plan is developed in accordance with CWS R&O 07-20. Plantings are designed to increase vegetation density and diversity and improve the vegetated corridor as the plantings grow and mature, placing the degraded vegetated corridor on a trajectory to a good rating in accordance with CWS criteria. Table 9 depicts planting calculations planned for the vegetated corridor.

The planting plan serves as a guide to mimic natural conditions and the mix of species to be planted is tailored to the moisture and light conditions of the site. Final species selection will depend on plant availability at the time of installation. A breakdown of the proposed planting effort by cover type and associated plant totals is presented in Table 9. The planting total for all mitigation areas is calculated to be 6,498 trees and 32,586 shrubs.

**Table 9**  
**Proposed Planting Treatments for Vegetated Corridor Enhancement**  
**Crescent Grove Property**

Scientific Name	Common Name	On Center Spacing (feet)	Plant Numbers
<b>Trees</b>			
<b>CWS Standards</b>			0.01 trees/sf
<i>Alnus rubra</i>	Red alder	7	1624
<i>Acer macrophyllum</i>	Big leaf maple	7	1300
<i>Pseudotsuga menziesii</i>	Douglas Fir	7	1624
<i>Prunus emarginata</i>	Bitter Cherry	7	325
<i>Rhamnus purshiana</i>	Cascara	7	325

Scientific Name	Common Name	On Center Spacing (feet)	Plant Numbers
<i>Thuja plicata</i>	Western red cedar	7	1300
<b>Tree subtotal</b>			6498
<b>Shrubs</b>			
<b>CWS Standards</b>			0.05 shrubs/sf
<i>Amelanchier alnifolia</i>	Serviceberry	4	4888
<i>Holodiscus discolor</i>	Oceanspray	4	2444
<i>Mahonia nervosa</i>	Cascade Oregon-Grape	4	1629
<i>Sambucus racemosa</i>	Red Elderberry	4	4888
<i>Lonicera involucrata</i>	Twinberry	4	3259
<i>Oemleria cerasiformis</i>	Indian plum	4	4888
<i>Symphoricarpos albus</i>	Snowberry	4	4888
<i>Ribes sanguineum</i>	Red flowering currant	4	2444
<i>Rosa nutkana</i>	Nootka Rose	4	1629
<i>Rosa pisocarpa</i>	Clustered Rose	4	1629
<b>Shrub subtotal</b>			32586
<b>Total Plants</b>			<b>39084</b>

Notes:

1. Plants (especially shrubs) should be clumped to mimic natural conditions.
  2. Final species quantities dependent upon availability.
- sf = square foot

### 8.1.3 Planting Guidelines

General guidelines for plant material and their installation are as follows:

- Qualified staff will supervise the planting process. Modifications to the planting plan may occur based on field conditions and the availability of plant material.
- Woody planting will occur in the fall or winter after plant dormancy has commenced (December 1 to March 31).
- Plantings will be bare-root, live stake, and containerized (1-gallon) native plant seedlings, as appropriate, from regional genetic stock. Plastic nursery identification tags will be attached to the stem of each woody planting.
- Tree and shrub seedlings will be a minimum height of 18 inches. Seedlings are typically 1 to 3 years old.

- Local nursery stock will be used to ensure that material has acclimated to local conditions (reducing planting stress) and is genetically compatible with the local area.
- Final plant lists will be contingent upon plant availability. If selected species are unavailable from local nurseries, other genus or species with similar hydrological requirements may be substituted.
- Plantings will be distributed in a random pattern to mimic natural conditions. Grouping or clustering of individual species is appropriate, particularly for shrub species.
- Proposed locations of woody trees and shrubs will be field staked and identified with an approved coding system or by placement of the actual plant material.
- Plant stock will be handled in a manner that will not break, scrape, or twist any portion of the plant. Protect plants at all times from conditions that can damage the plant (e.g., sun, wind, or freezing conditions).
- Excavate plant pits for trees and shrubs will be container stock, width of two times the ball diameter and depth equal to the ball depth, and bare root stock, width of two times the widest diameter of the roots and depth equal to the root system.
- Plants will be placed plumb in the pit, backfill with native soil to the original plant soil line, and tap solidly around the ball and roots. Water all plants immediately after planting if soil is not saturated to the surface.
- Woody plantings will only be staked if the plant cannot stand alone in a moderate wind. Remove stakes as soon as their support becomes unnecessary.
- Woody plantings will be fertilized with a slow release (8 months), high nitrogen granular fertilizer (21-3-7), with application rates as specified by the manufacturer. Fertilizer will be applied at the base of the plant after the plant pit is backfilled, prior to the application of mulch.
- Woody plantings will be mulched with a minimum of 3 inches of organic matter (e.g., weed-free straw, compost, or bark mulch) to 18 inches in diameter to discourage weed growth, minimize soil erosion, and retain moisture. The mulch must not make contact with the plant stem.
- An appropriate material or treatment to deter wildlife depredation and damage will be considered for woody plants.
- A temporary irrigation system will be installed to water plantings during the late spring/summer/early fall dry season to increase plant survival.

#### **8.1.4 Site Maintenance**

A 2-year maintenance program will be initiated to help insure enhancement goals are achieved. Maintenance of the planting areas will take place in the summer months following initial planting and will be most aggressive in the first year of native plant establishment. Invasive, non-native vegetation will be controlled by combining methods including cutting, pulling, and herbicide application to control their re-establishment. Herbicide spraying will occur only under windless conditions, and shields will be used to protect adjacent woody plants from overspray and drift. Aggressive vegetation management will be pursued for the 2-year maintenance period, while native plantings become established. Plants will be replaced if R&O 07-20 success standards for survival (80% of the planting specifications) are not met during the maintenance period. The plant survival rate for the planting areas will most likely be as follows:

- Vegetated corridor mitigation and enhancement: 5,198 trees (80% of 6,498 trees planted) and 26,069 shrubs (80% of 32,586 shrubs planted)

Bare ground will be reseeded as needed.

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## 9 SUMMARY

Anchor QEA was retained by West Hills Development to prepare a CWS NRA for the proposed South Cooper Mountain Heights Property development in unincorporated Washington County, Oregon. Eight water quality sensitive areas were identified on site, totaling 11.18 acres, based on assignment of 50-foot vegetated corridor widths per CWS R&O 07-20 guidance, totaling 13.02 acres of buffer area on site.

The areas of temporary and permanent impacts to proposed vegetated buffers as a result of development were determined to be 0.998 acre; permanent impacts will occur on 0.940 acre and on-site mitigation areas were identified for buffer creation or preservation to offset losses. Temporary impact areas (0.058 acre) will be planted and restored. In total, 6,498 trees and shrubs will be planted to enhance and establish vegetated buffer zones around the two on-site water quality sensitive areas. With this submittal, West Hills Development is requesting the issuance of a Service Provider Letter by CWS.

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## 10 REFERENCES

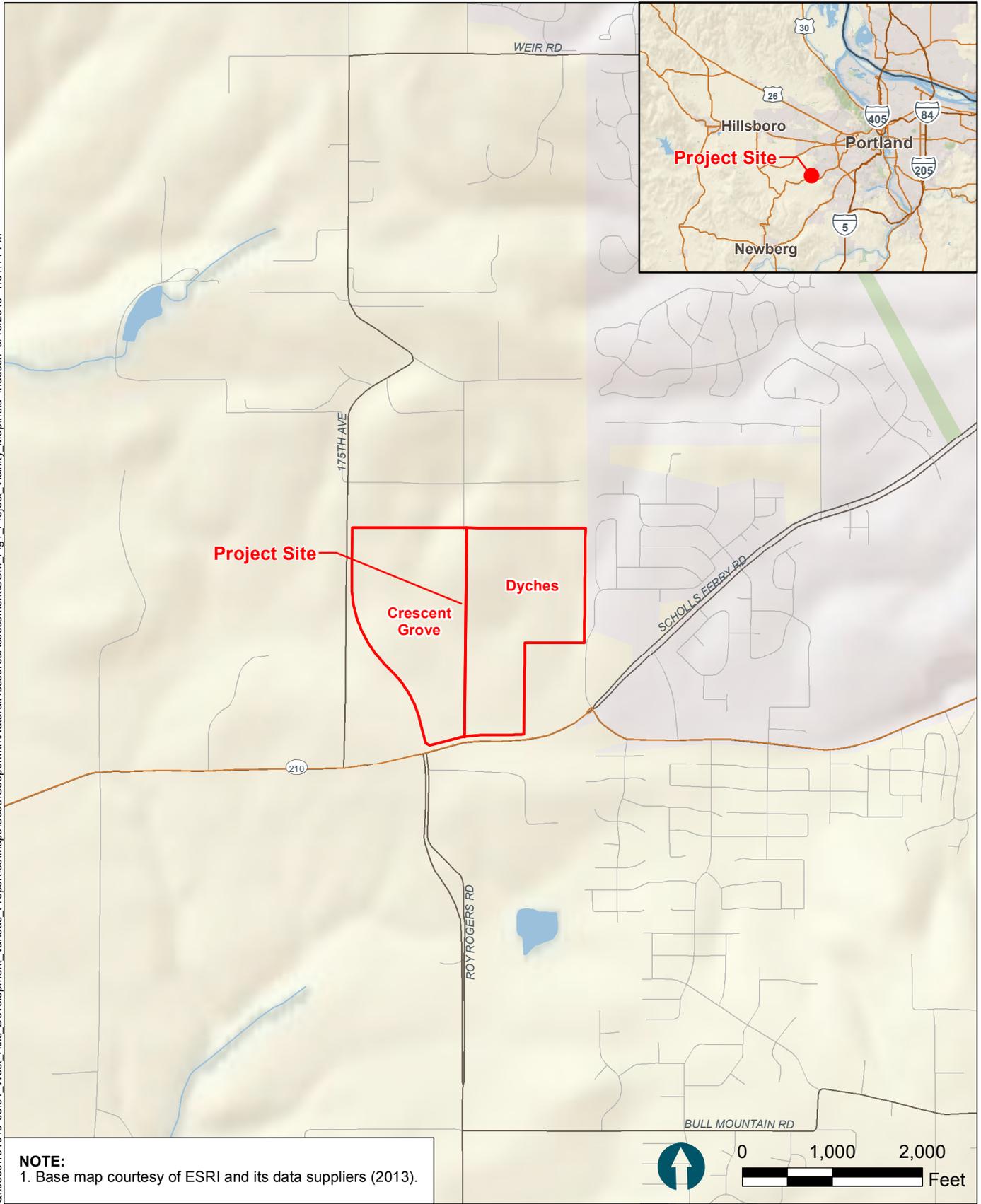
- AKS Engineering & Forestry, 2014. *Dyches Property Wetland and Waters Delineation Report*. Beaverton, Oregon. November 2014.
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- USGS (U.S. Geological Survey), 2011. Beaverton Quadrangle. Oregon, Washington County. 7.5 Minute Series.

# FIGURES

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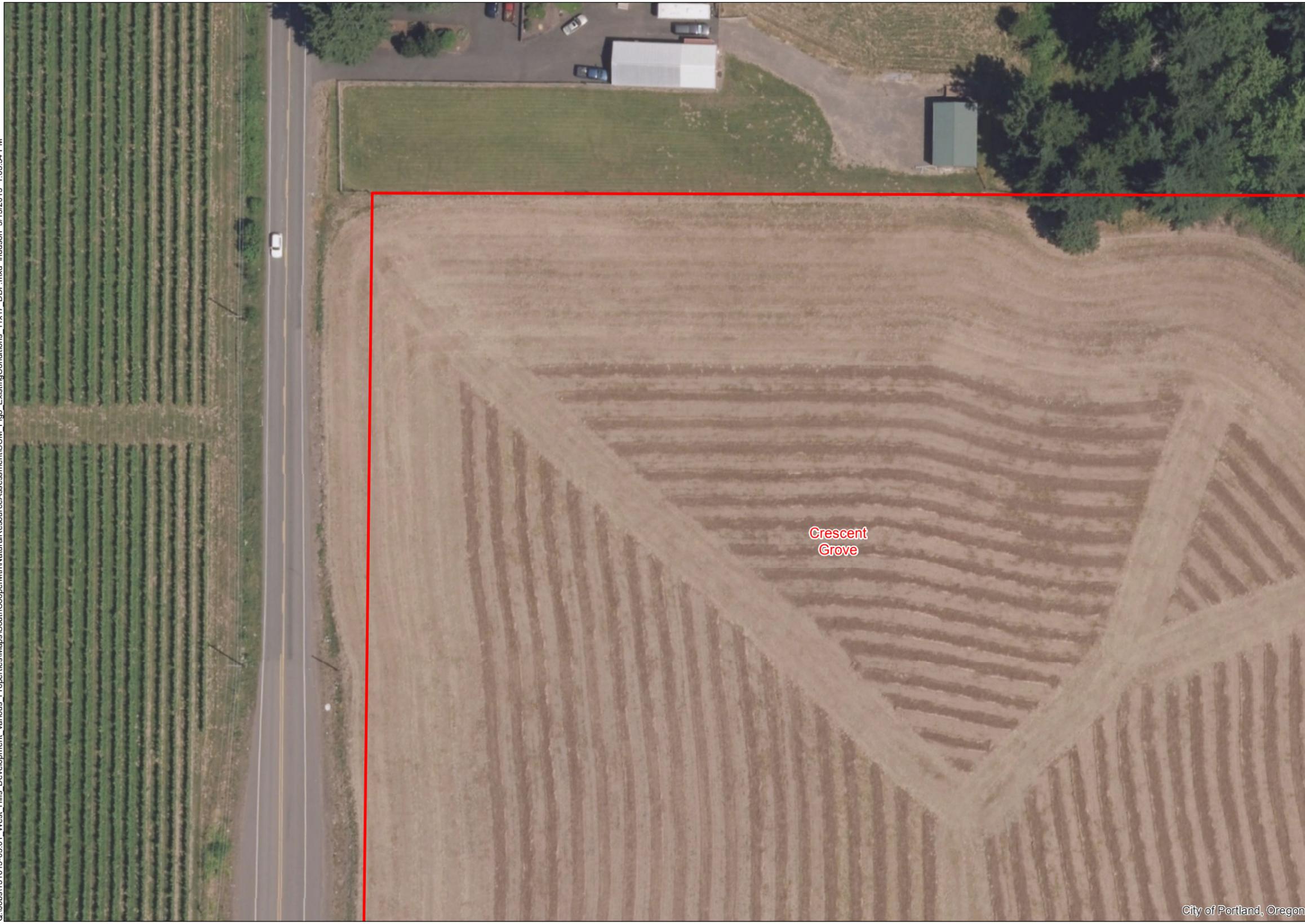


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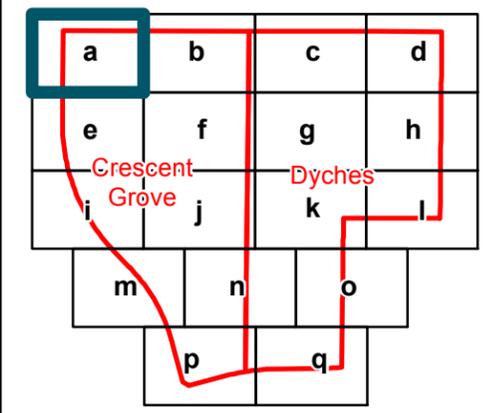
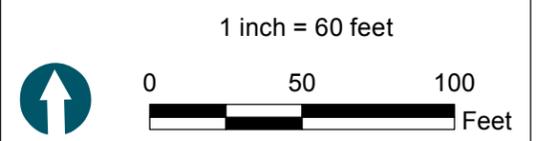
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City of Portland, Oregon

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**NOTE:**  
1. Aerial imagery acquired from Portland Maps Server, City of Portland (2013).

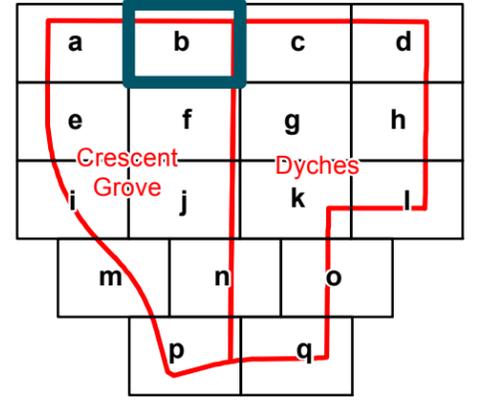
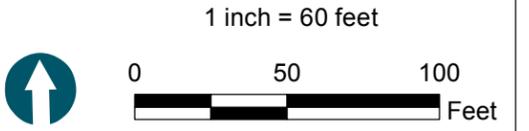


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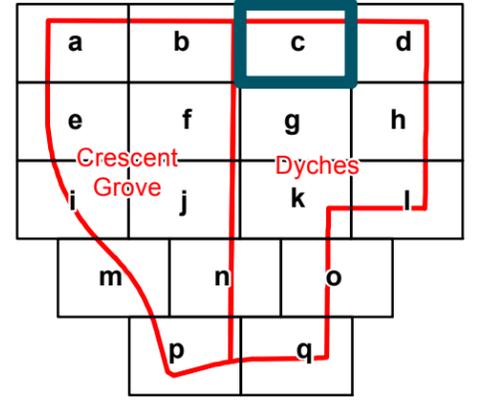
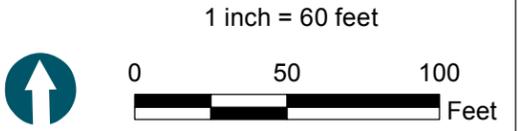
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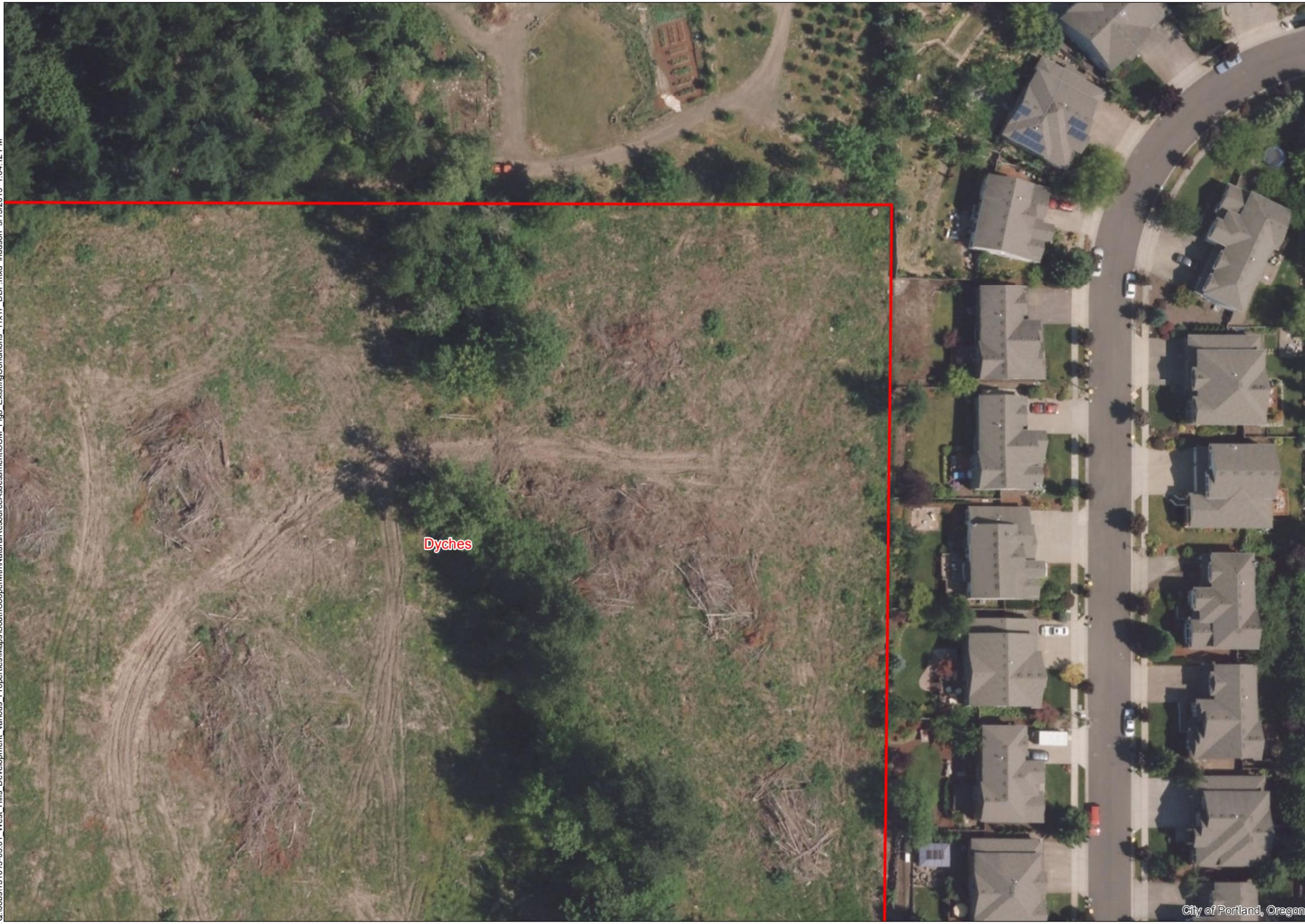


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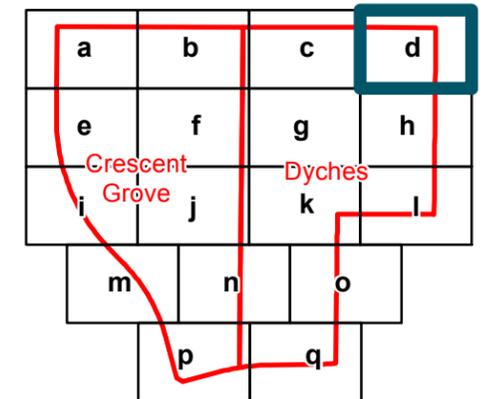
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1 inch = 60 feet



0 50 100 Feet







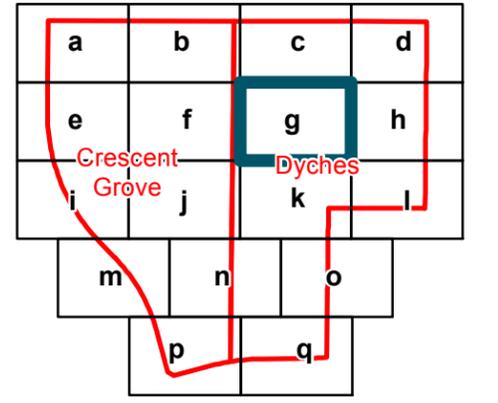
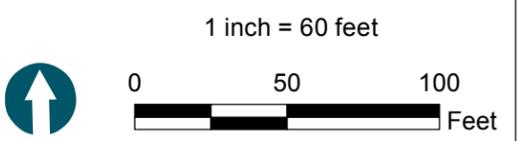
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City of Portland, Oregon

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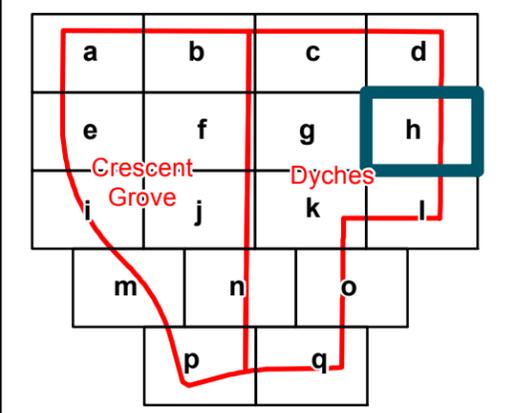
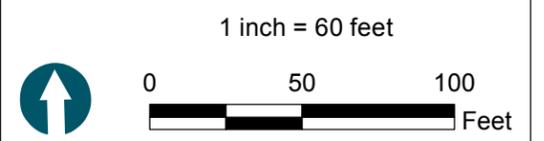


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**NOTE:**  
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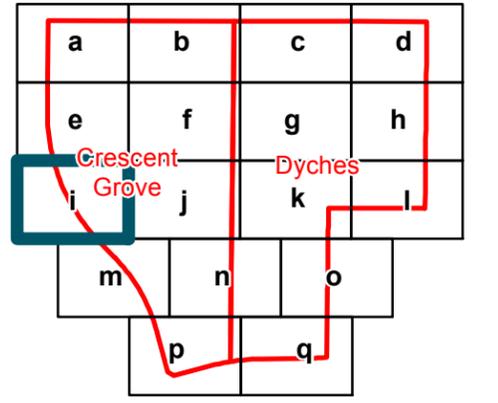
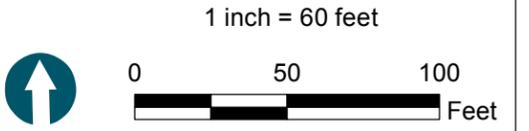
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City of Portland, Oregon

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**NOTE:**  
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 Project Site Boundary

**NOTE:**  
1. Aerial imagery acquired from Portland Maps Server, City of Portland (2013).

1 inch = 60 feet

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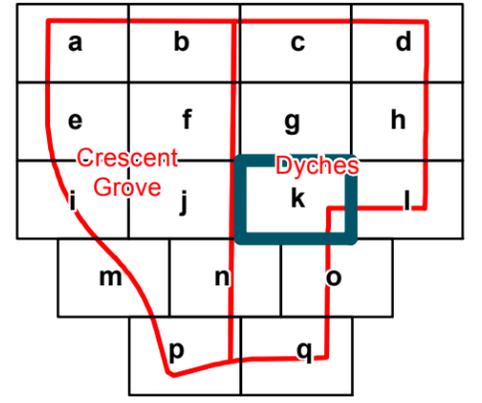
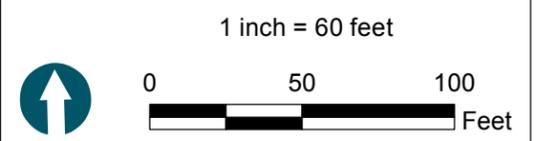
**Figure 3j**  
Existing Conditions  
South Cooper Mountain Heights Natural Resource Assessment  
Washington County, OR

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 Project Site Boundary

**NOTE:**  
1. Aerial imagery acquired from Portland Maps Server, City of Portland (2013).



City of Portland, Oregon

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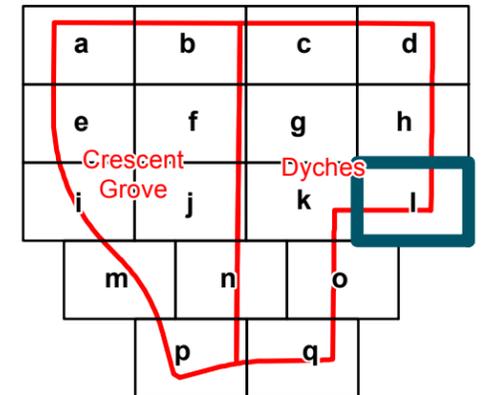


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**NOTE:**  
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1 inch = 60 feet  
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City of Portland, Oregon

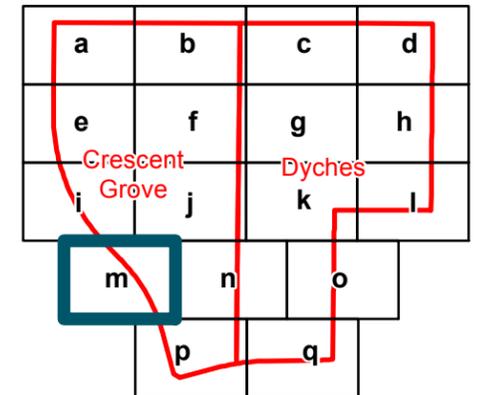
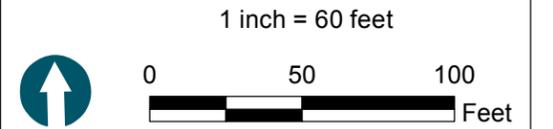
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City of Portland, Oregon

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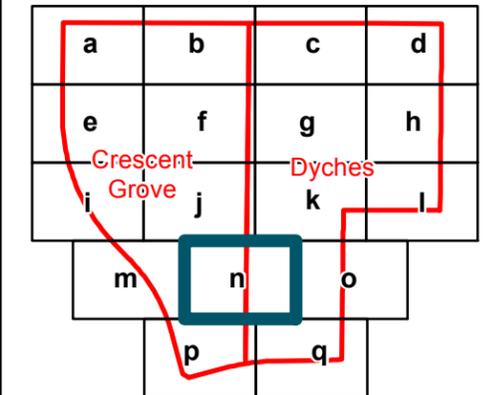
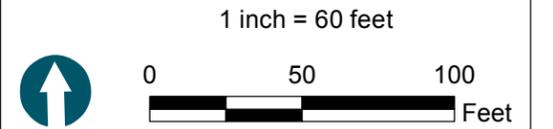
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City of Portland, Oregon

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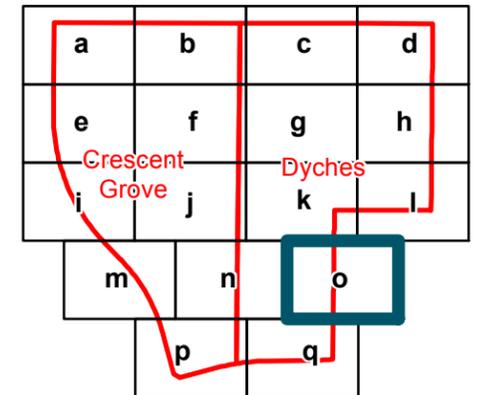
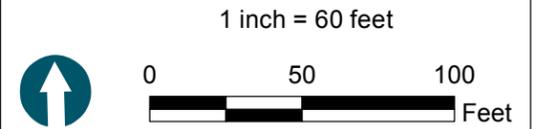
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City of Portland, Oregon

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**NOTE:**  
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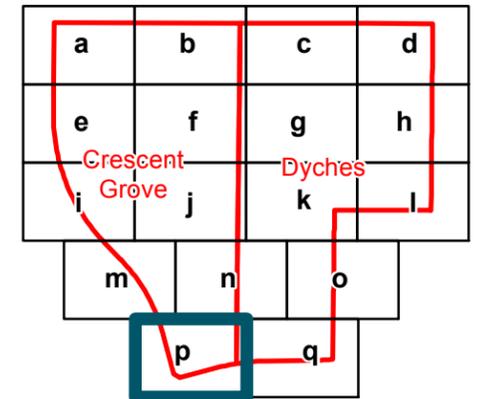
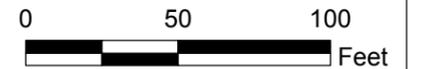


 Project Site Boundary

**NOTE:**  
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1 inch = 60 feet



City of Portland, Oregon

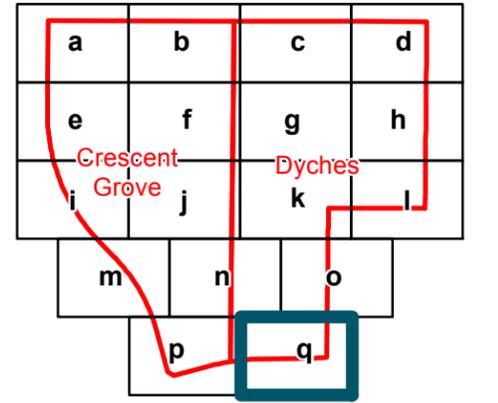
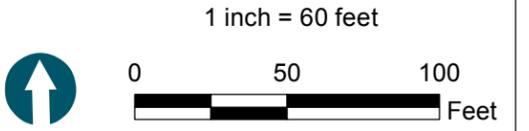
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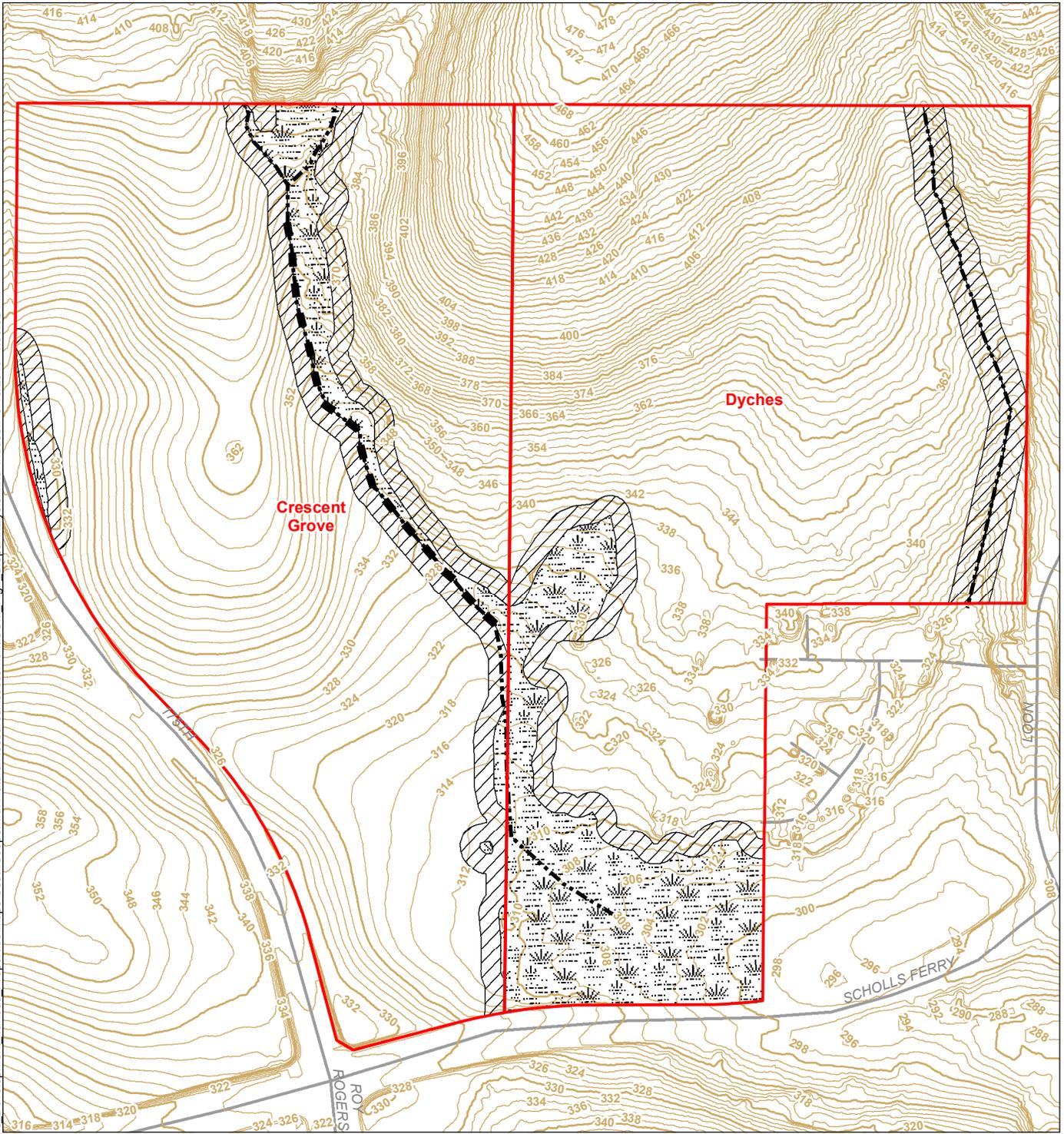
City of Portland, Oregon

 Project Site Boundary

**NOTE:**  
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Project Site Boundary	Top of Bank	Delineated Wetland
2-ft Contour	Stream	Vegetated Buffer

- NOTES:**
1. Contours and top of bank data acquired from Otak.
  2. Wetland boundaries and stream flagged and field surveyed by Otak, Inc., to 0.1-meter accuracy. Stream width is 2-ft at top of bank.
  3. Dyches property wetland delineation data acquired from AKS Engineering and Forestry, LLC.

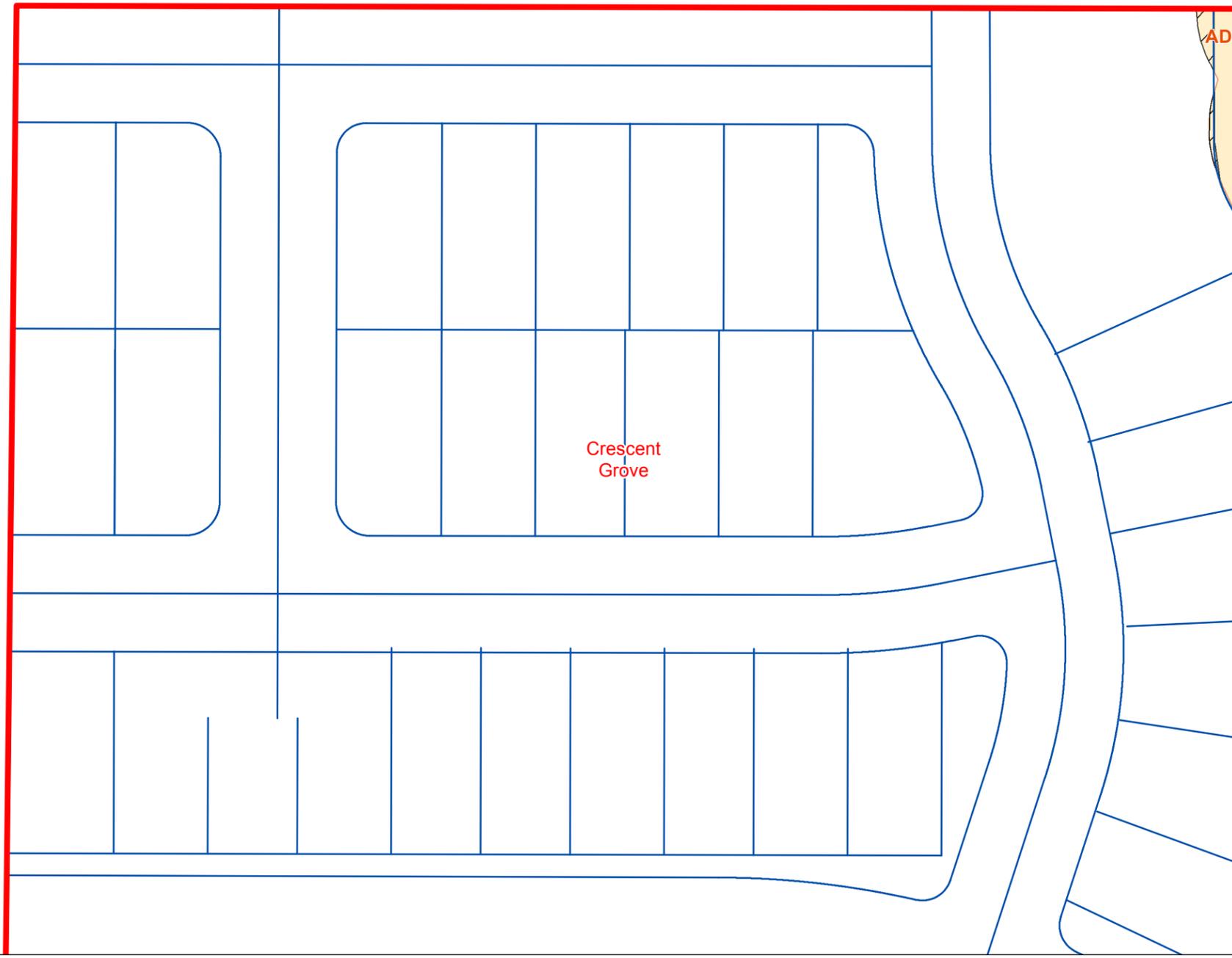
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**Figure 4**  
 Slope Analysis  
 South Cooper Mountain Heights Natural Resource Assessment  
 Washington County, OR

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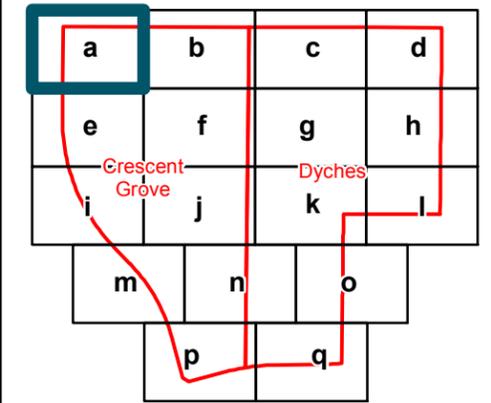
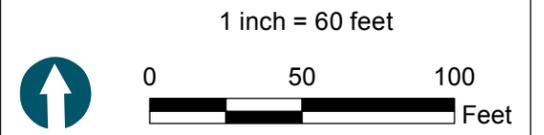
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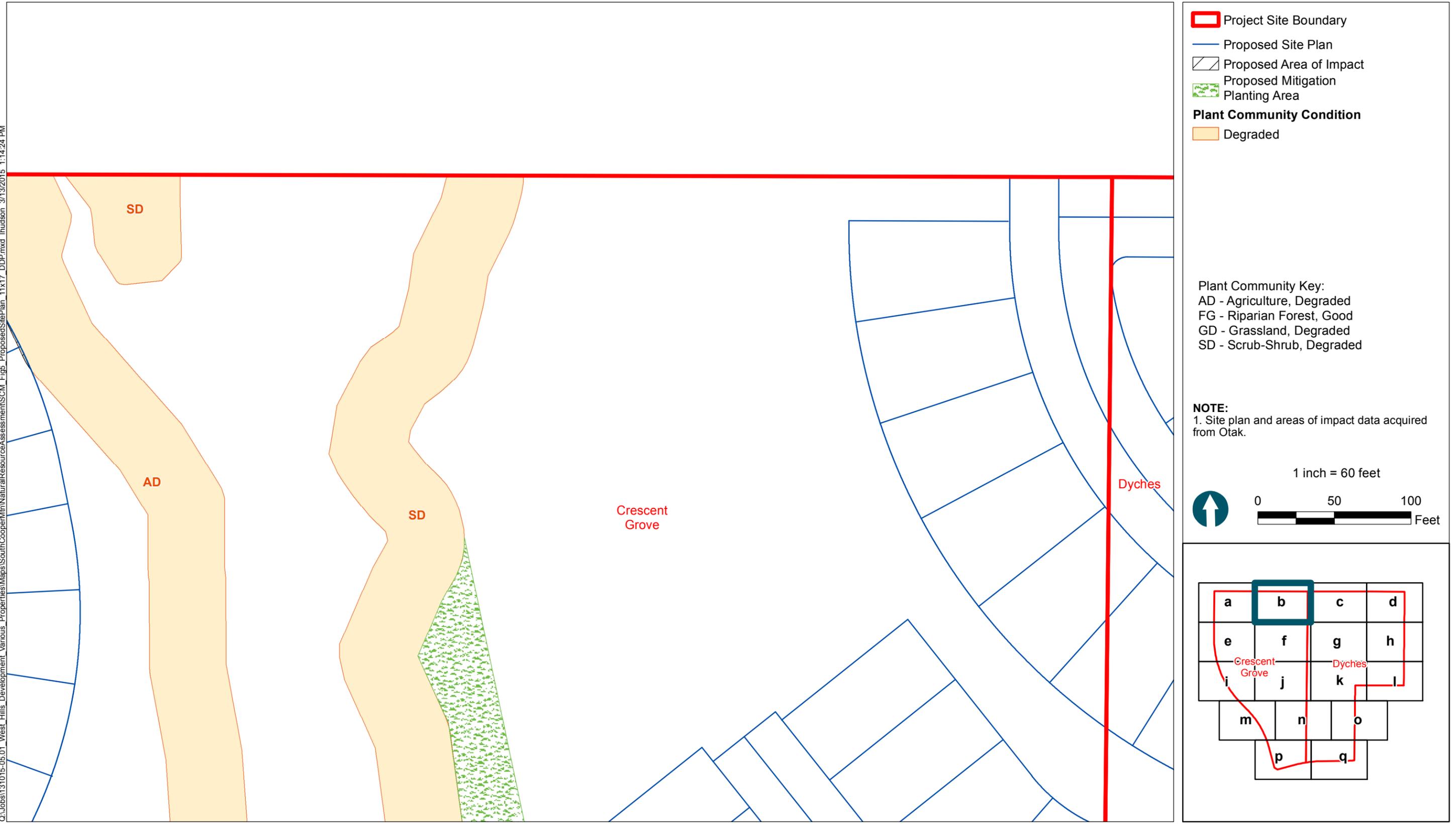
- Project Site Boundary
  - Road
  - Proposed Site Plan
  - Proposed Area of Impact
- Plant Community Condition**
- Degraded

**Plant Community Key:**  
 AD - Agriculture, Degraded  
 FG - Riparian Forest, Good  
 GD - Grassland, Degraded  
 SD - Scrub-Shrub, Degraded

**NOTE:**  
 1. Site plan and areas of impact data acquired from Otak.

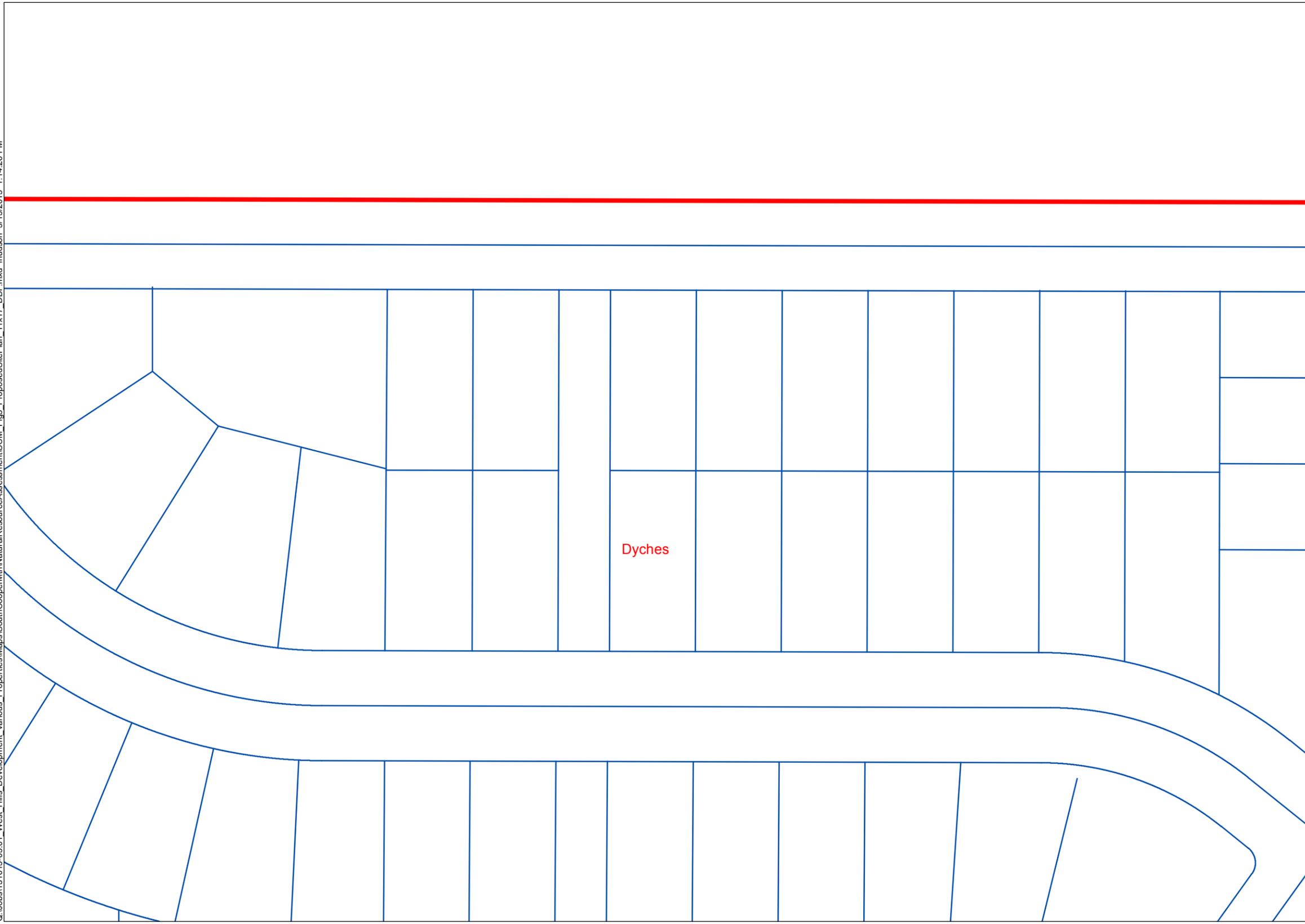


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**Figure 5b**  
Proposed Site Plan and Area of Impact  
South Cooper Mountain Heights Natural Resource Assessment  
Washington County, OR

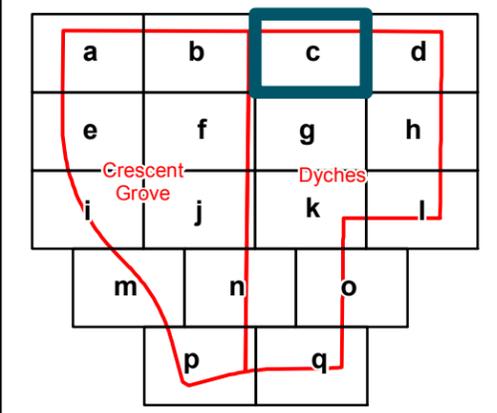
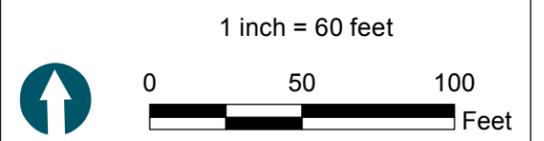
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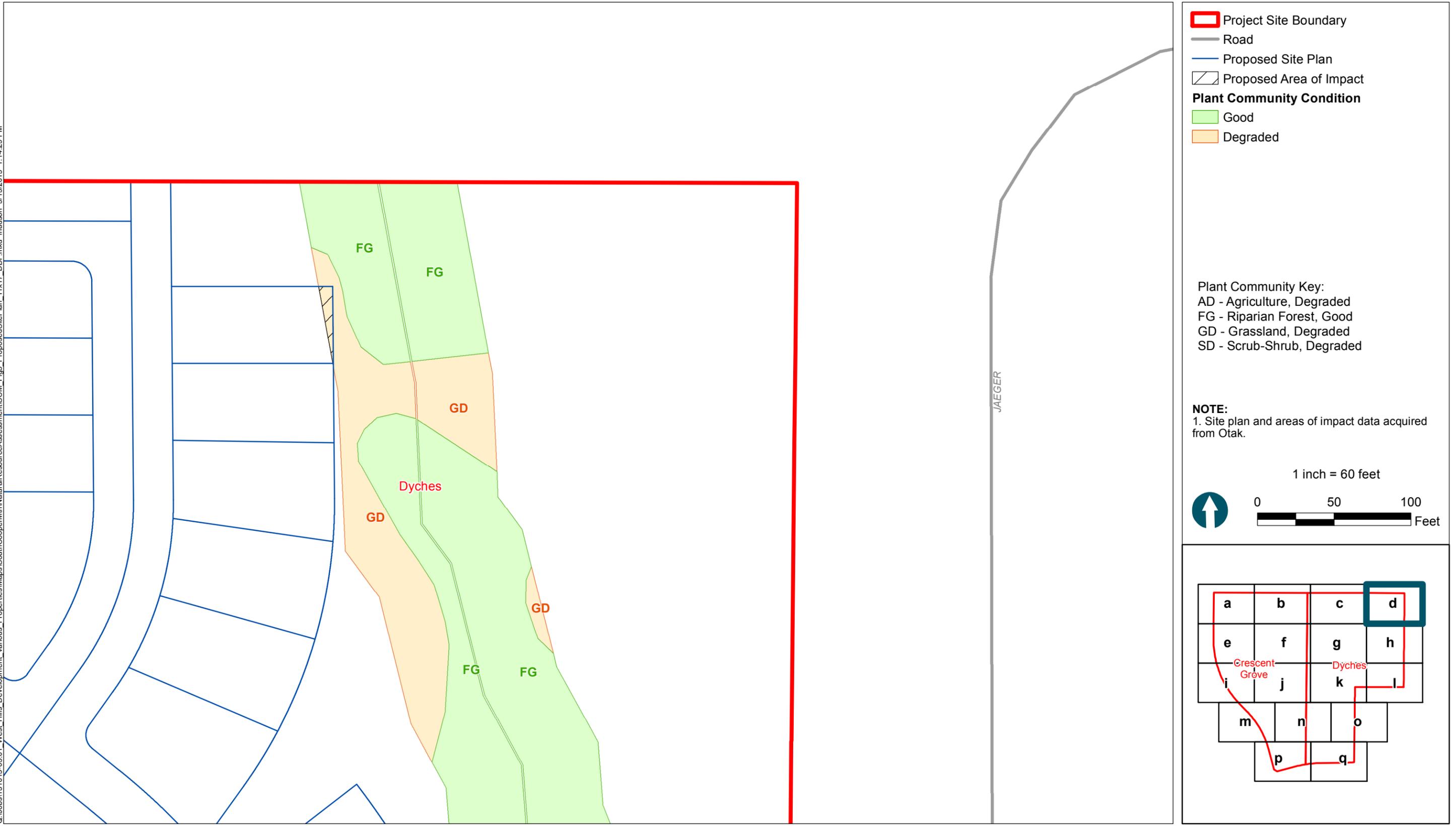
 Project Site Boundary  
 Proposed Site Plan

Plant Community Key:  
AD - Agriculture, Degraded  
FG - Riparian Forest, Good  
GD - Grassland, Degraded  
SD - Scrub-Shrub, Degraded

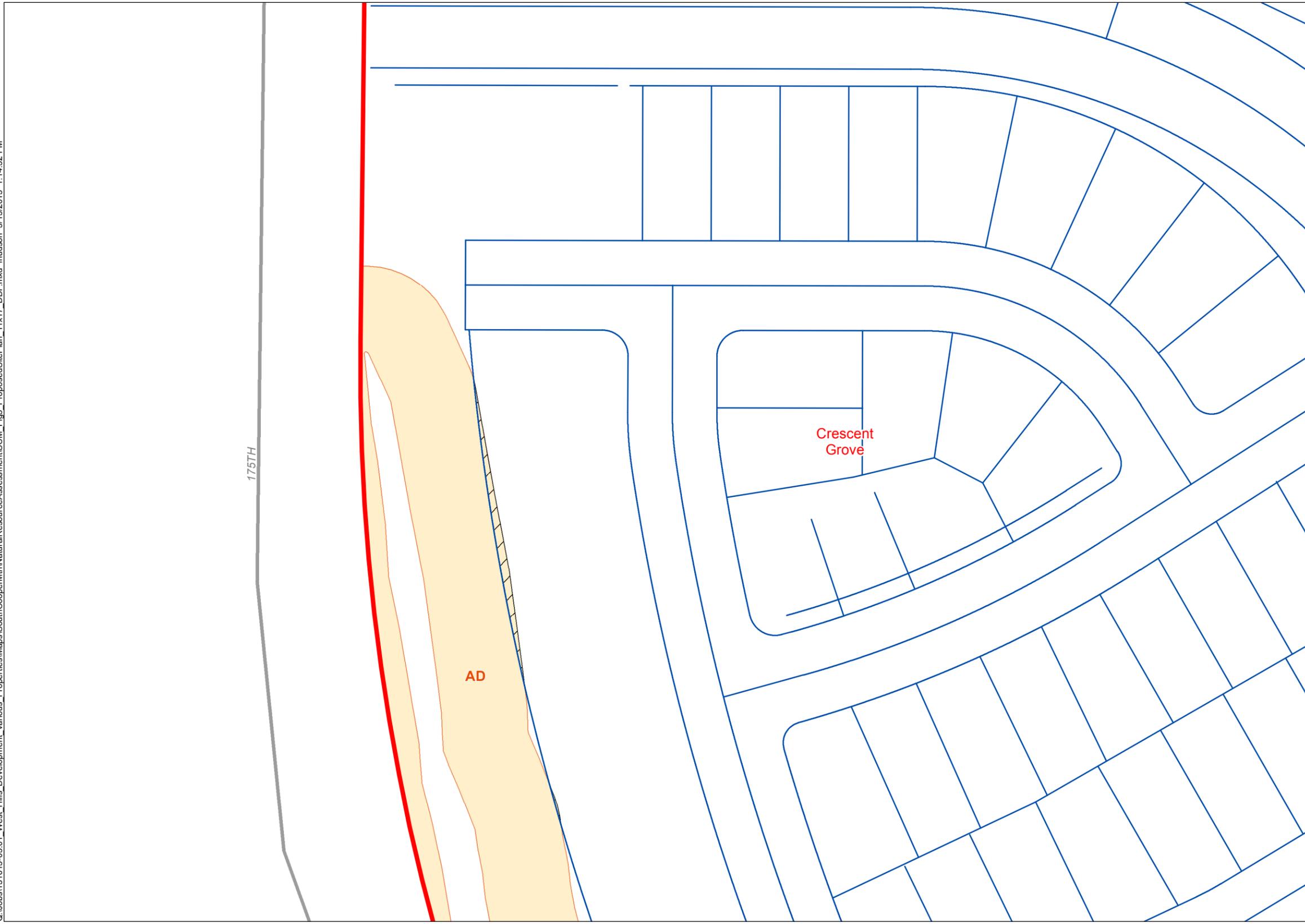
**NOTE:**  
1. Site plan and areas of impact data acquired from Otak.



Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:14:29 PM



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**Legend**

- Project Site Boundary
- Road
- Proposed Site Plan
- Proposed Area of Impact

**Plant Community Condition**

- Degraded

**Plant Community Key:**  
 AD - Agriculture, Degraded  
 FG - Riparian Forest, Good  
 GD - Grassland, Degraded  
 SD - Scrub-Shrub, Degraded

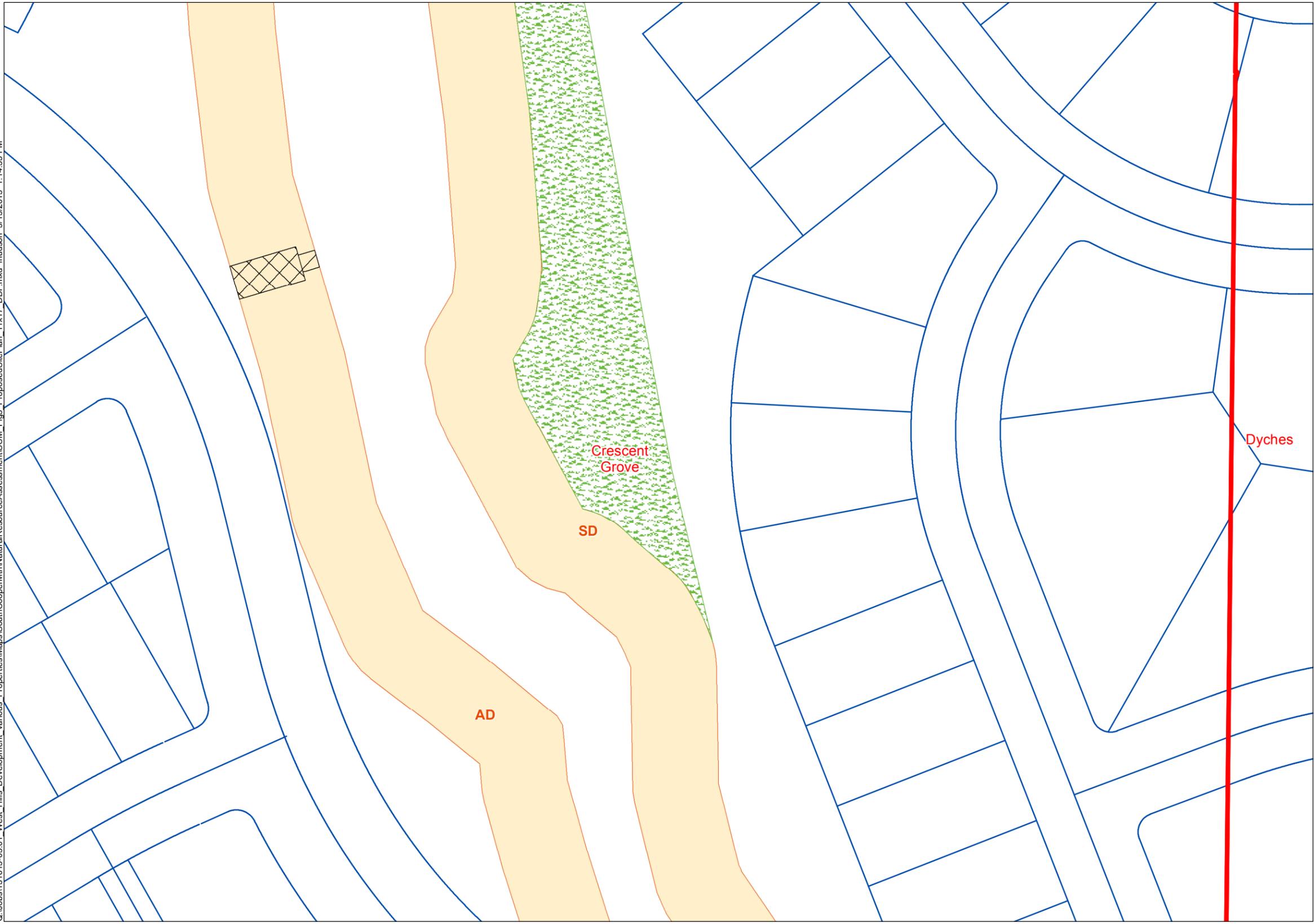
**NOTE:**  
 1. Site plan and areas of impact data acquired from Otak.

1 inch = 60 feet

a	b	c	d
e	f	g	h
i	j	k	l
m	n	o	
p	q		

Crescent Grove is located between cells e and j. Ditches are located between cells g and k, and between cells k and l.

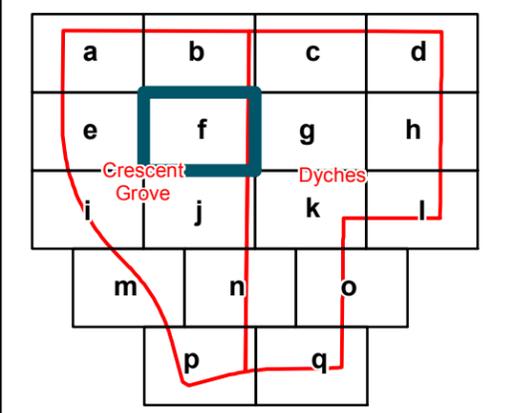
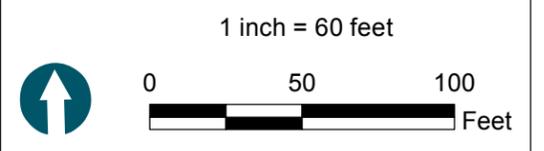
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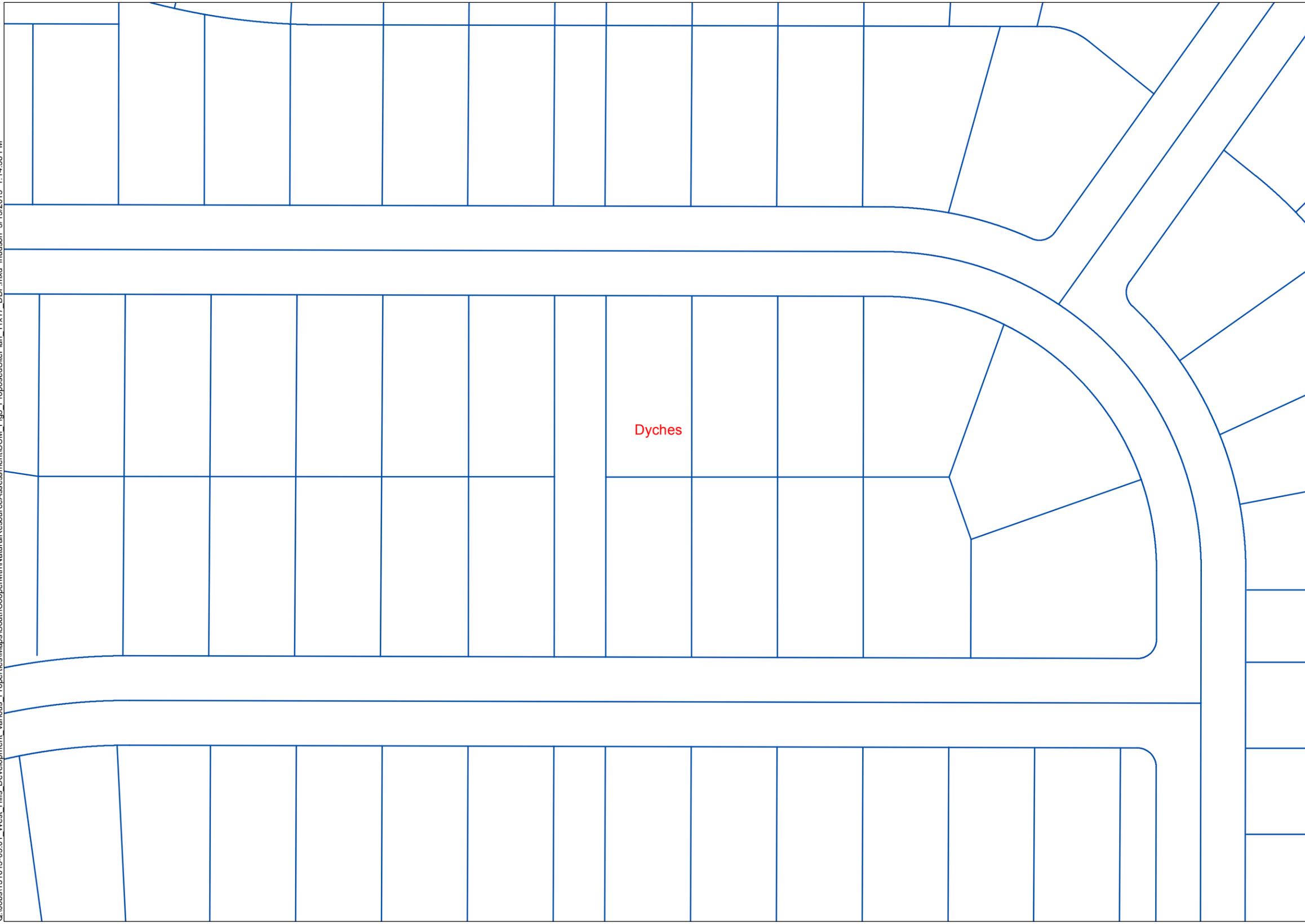
- Project Site Boundary
  - Proposed Site Plan
  - Proposed Area of Impact
  - Temporary Impact/Proposed Enhancement Planting Area
  - Proposed Mitigation Planting Area
- Plant Community Condition**
- Degraded

**Plant Community Key:**  
AD - Agriculture, Degraded  
FG - Riparian Forest, Good  
GD - Grassland, Degraded  
SD - Scrub-Shrub, Degraded

**NOTE:**  
1. Site plan and areas of impact data acquired from Otak.



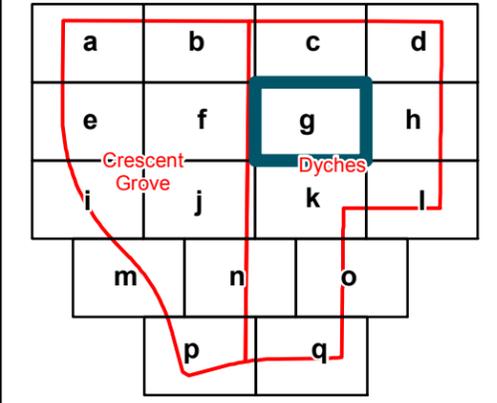
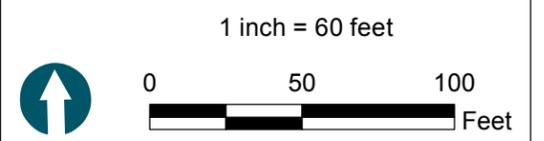
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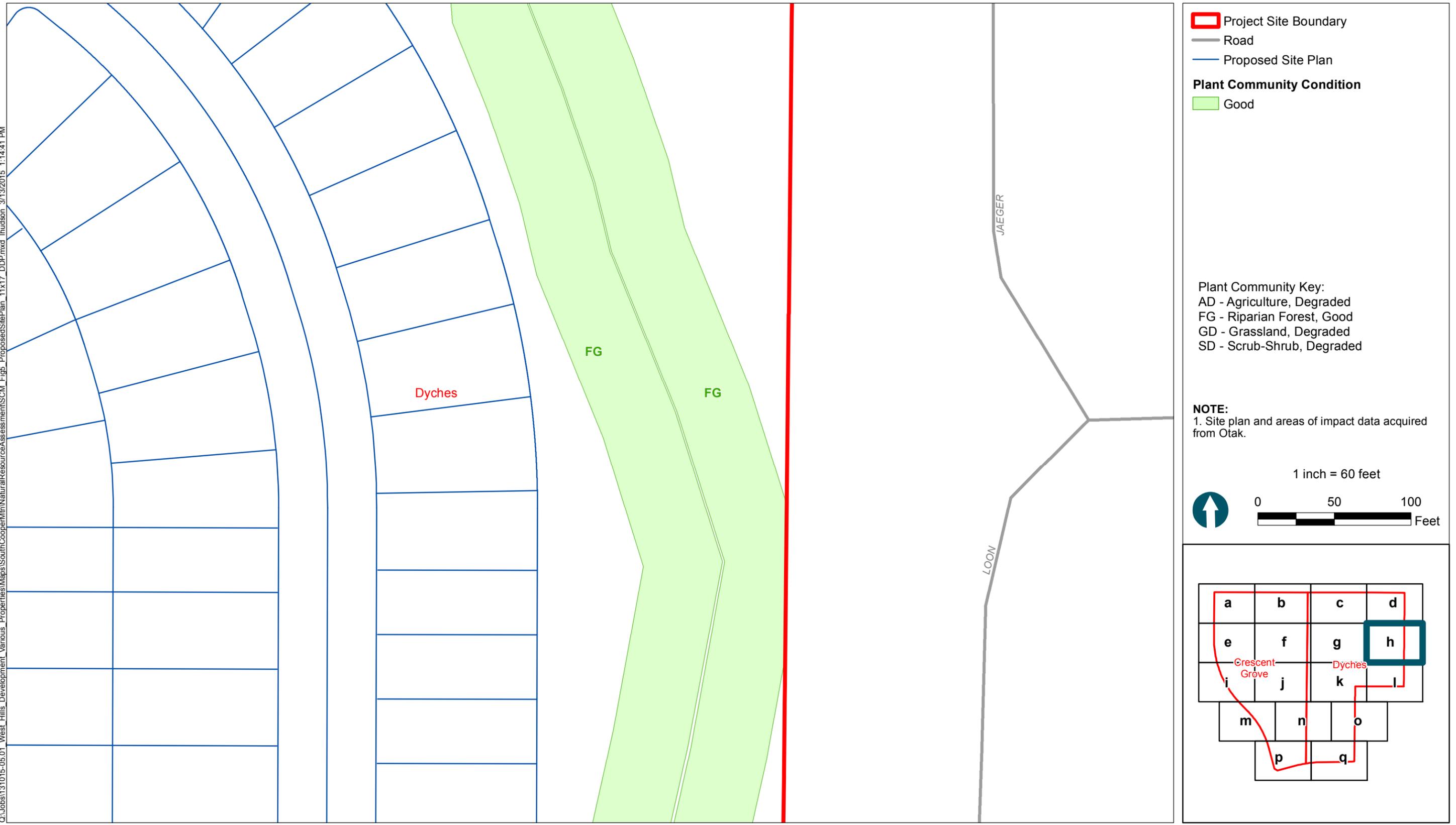
 Project Site Boundary  
 Proposed Site Plan

Plant Community Key:  
AD - Agriculture, Degraded  
FG - Riparian Forest, Good  
GD - Grassland, Degraded  
SD - Scrub-Shrub, Degraded

**NOTE:**  
1. Site plan and areas of impact data acquired from Otak.



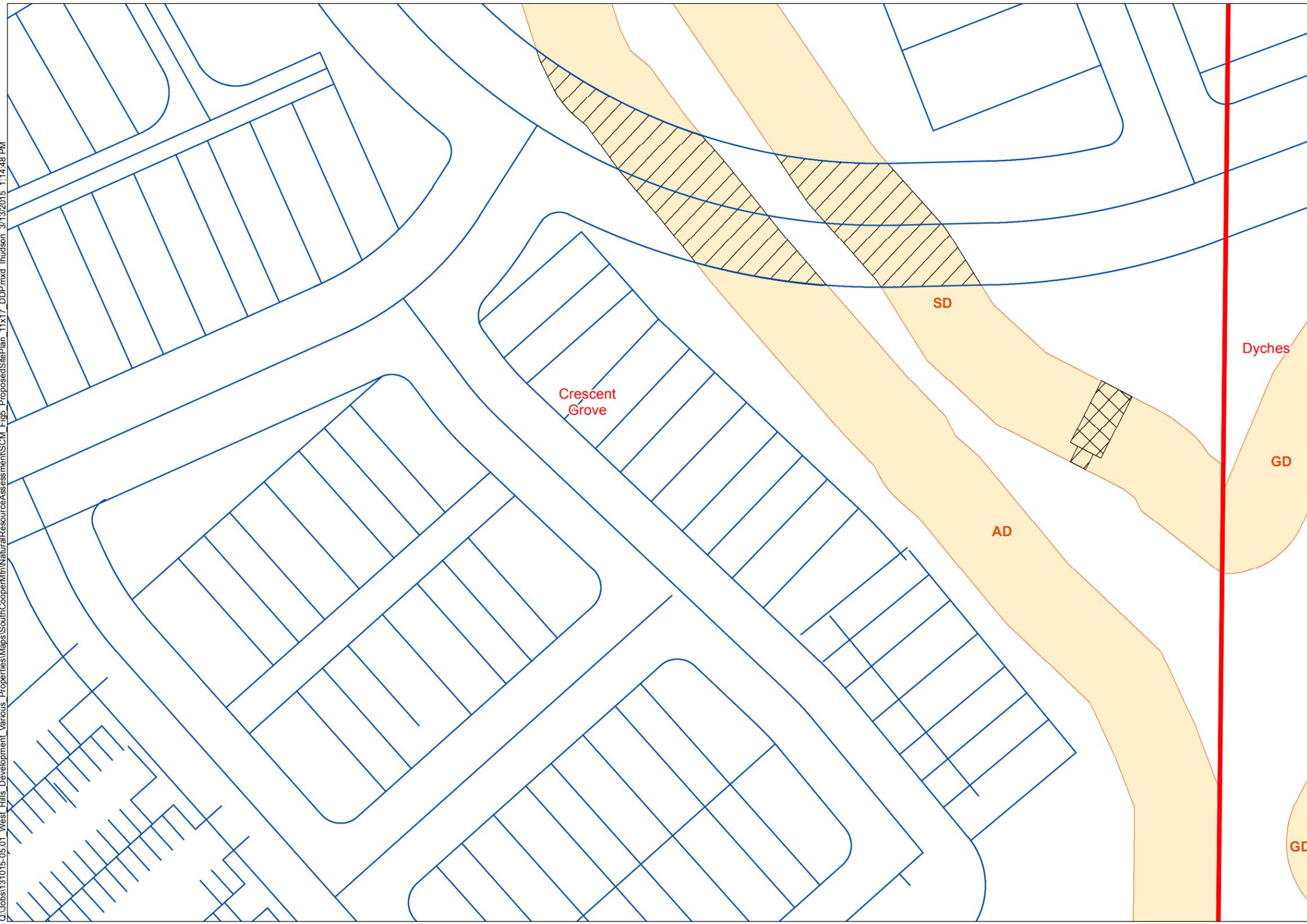
Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:14:41 PM



Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:14:45 PM



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**Project Site Boundary**  
Proposed Site Plan  
Proposed Area of Impact  
Temporary Impact/Proposed Enhancement Planting Area

**Plant Community Condition**  
Degraded

**Plant Community Key:**  
AD - Agriculture, Degraded  
FG - Riparian Forest, Good  
GD - Grassland, Degraded  
SD - Scrub-Shrub, Degraded

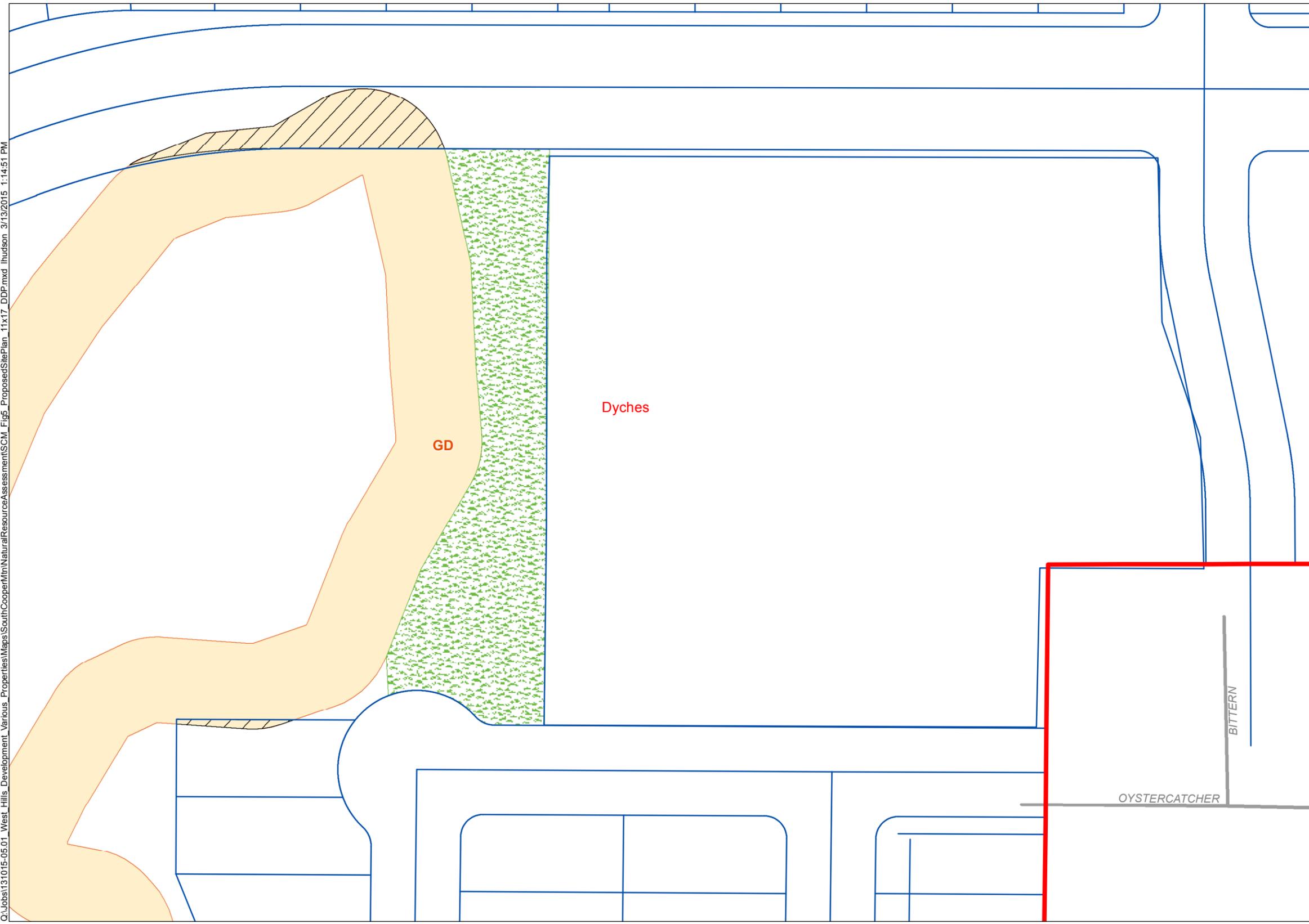
**NOTE:**  
1. Site plan and areas of impact data acquired from Otak.

1 inch = 60 feet

0 50 100 Feet

a	b	c	d
e	f	g	h
i	j	k	l
m	n	o	
p	q		

Q:\Jobs\131015-05.01 West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:14:51 PM



**Project Site Boundary**  
 Road  
 Proposed Site Plan  
 Proposed Area of Impact  
 Proposed Mitigation Planting Area

**Plant Community Condition**  
 Degraded

**Plant Community Key:**  
 AD - Agriculture, Degraded  
 FG - Riparian Forest, Good  
 GD - Grassland, Degraded  
 SD - Scrub-Shrub, Degraded

**NOTE:**  
 1. Site plan and areas of impact data acquired from Otak.

1 inch = 60 feet

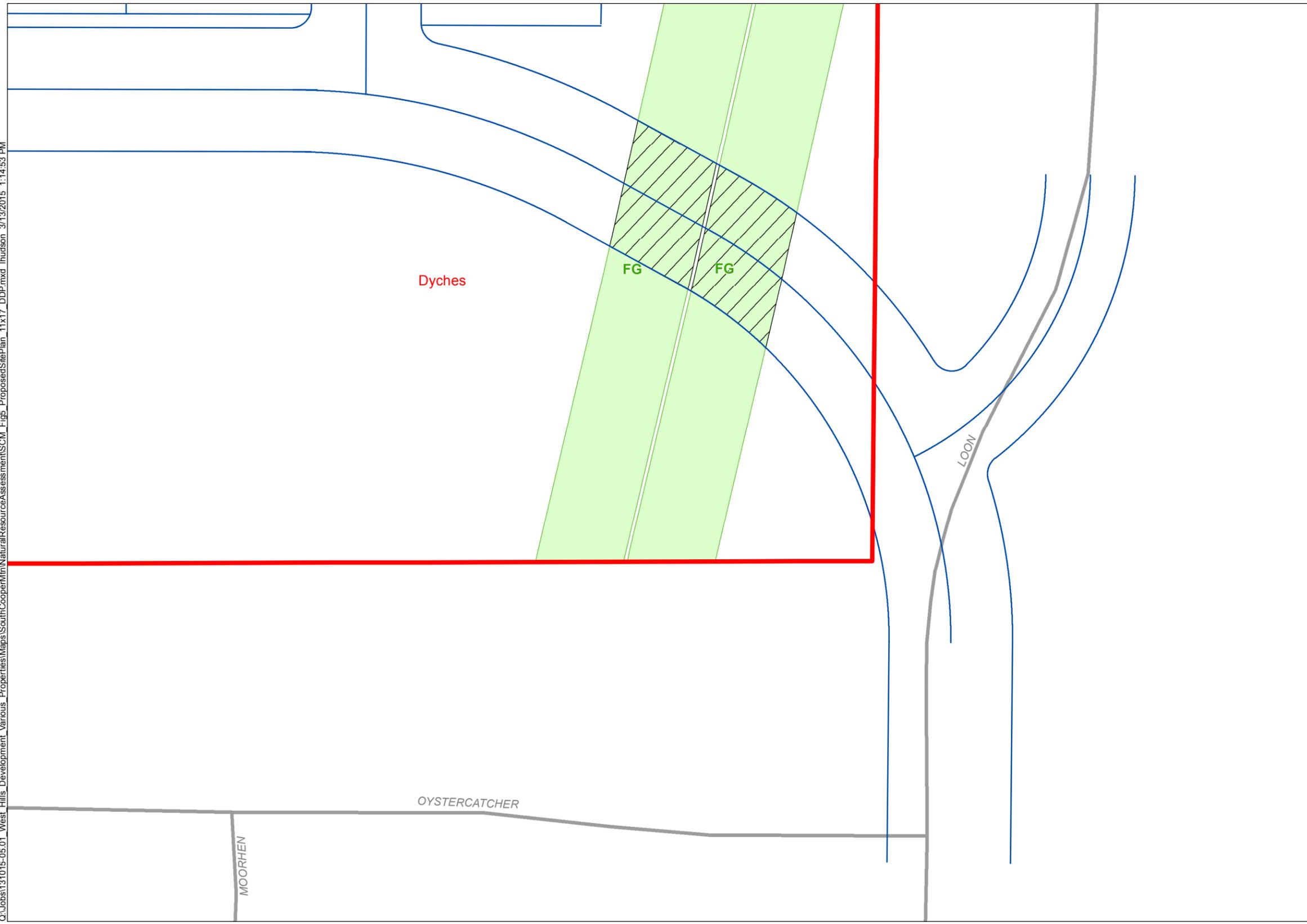
0 50 100 Feet

a	b	c	d
e	f	g	h
i	j	k	l
m	n	o	
p	q		

*Crescent Grove* (near cell i)

*Dyches* (near cell k)

Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:14:53 PM



**Project Site Boundary**  
— Road  
— Proposed Site Plan  
▨ Proposed Area of Impact

**Plant Community Condition**  
■ Good

**Plant Community Key:**  
AD - Agriculture, Degraded  
FG - Riparian Forest, Good  
GD - Grassland, Degraded  
SD - Scrub-Shrub, Degraded

**NOTE:**  
1. Site plan and areas of impact data acquired from Otak.

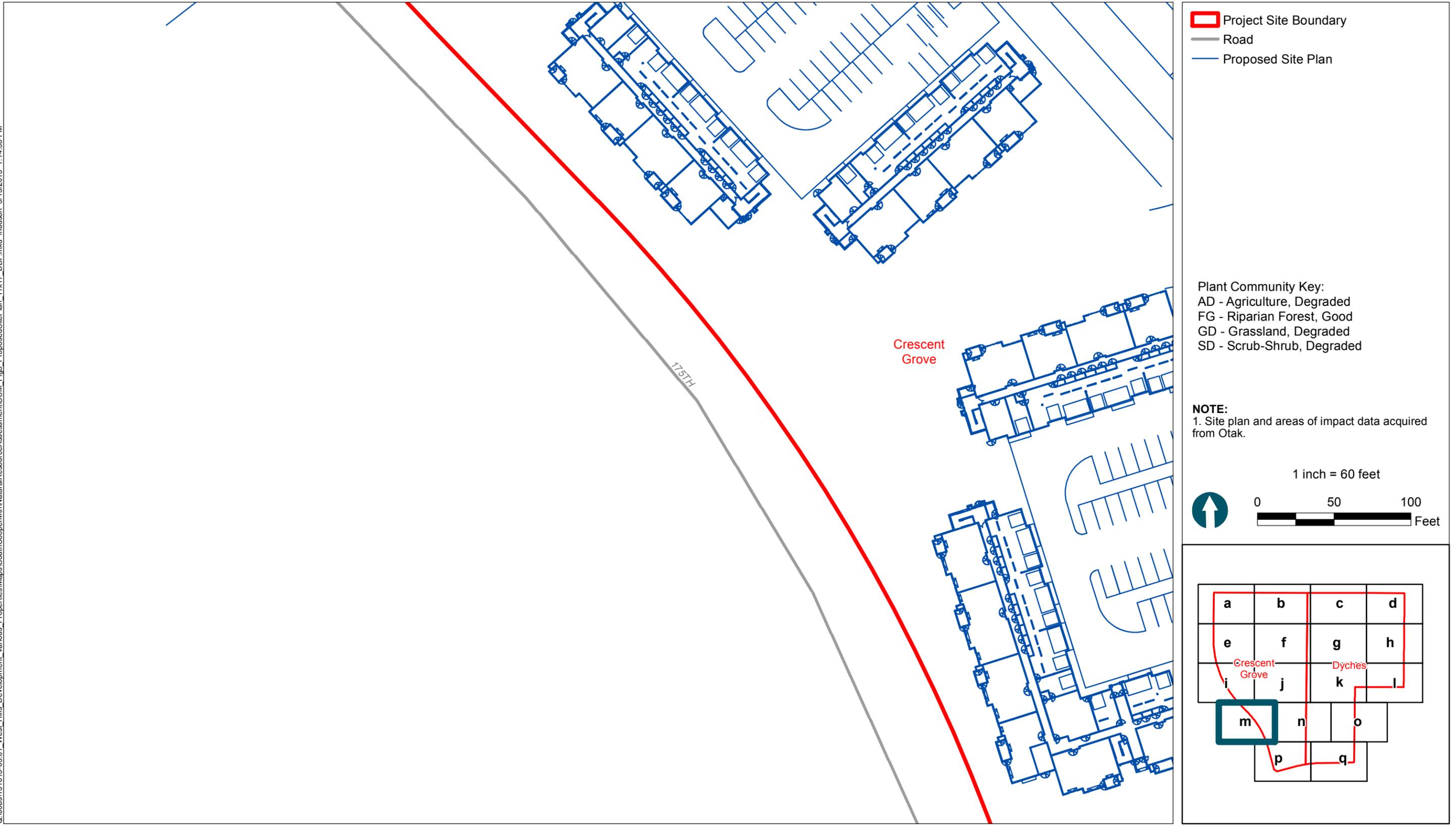
1 inch = 60 feet

0 50 100 Feet

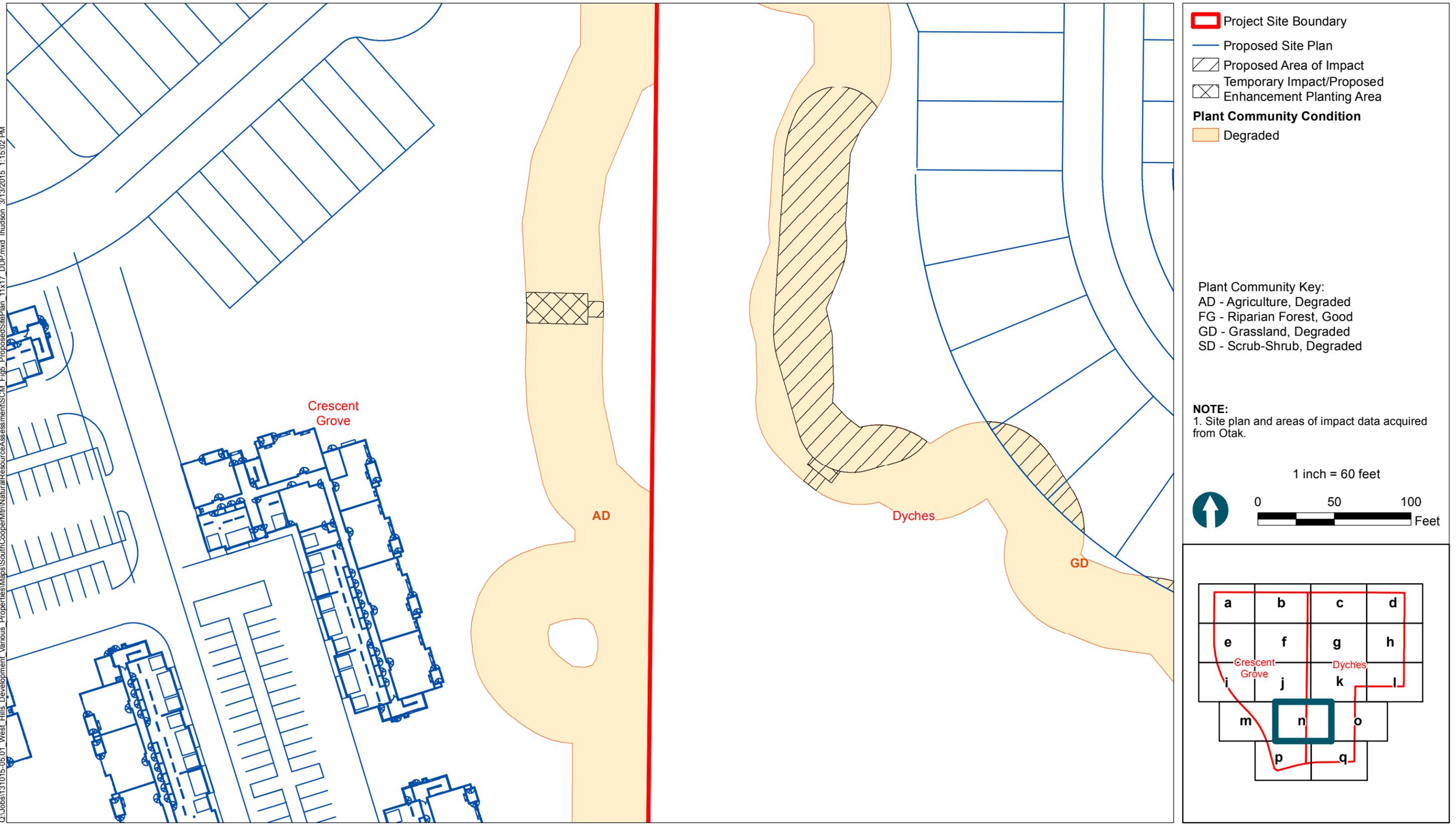
a	b	c	d
e	f	g	h
i	j	k	l
m	n	o	
p	q		

Crescent Grove  
Dyches

C:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:14:58 PM



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**Figure 5n**  
Proposed Site Plan and Area of Impact  
South Cooper Mountain Heights Natural Resource Assessment  
Washington County, OR

Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:15:05 PM



**Project Site Boundary**  
 — Road  
 — Proposed Site Plan  
 ▨ Proposed Area of Impact

**Plant Community Condition**  
 Degraded

**Plant Community Key:**  
 AD - Agriculture, Degraded  
 FG - Riparian Forest, Good  
 GD - Grassland, Degraded  
 SD - Scrub-Shrub, Degraded

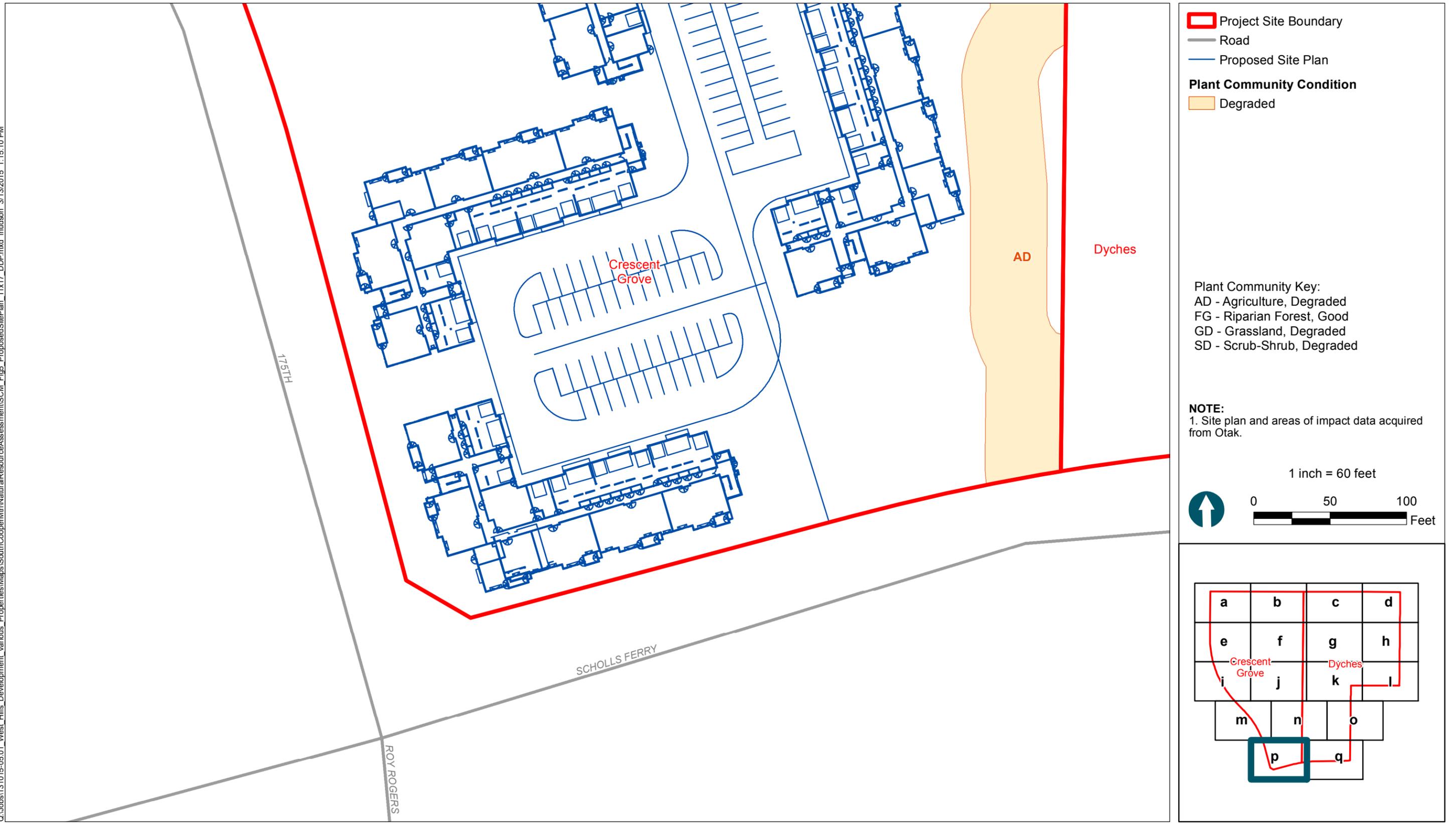
**NOTE:**  
 1. Site plan and areas of impact data acquired from Otak.

1 inch = 60 feet

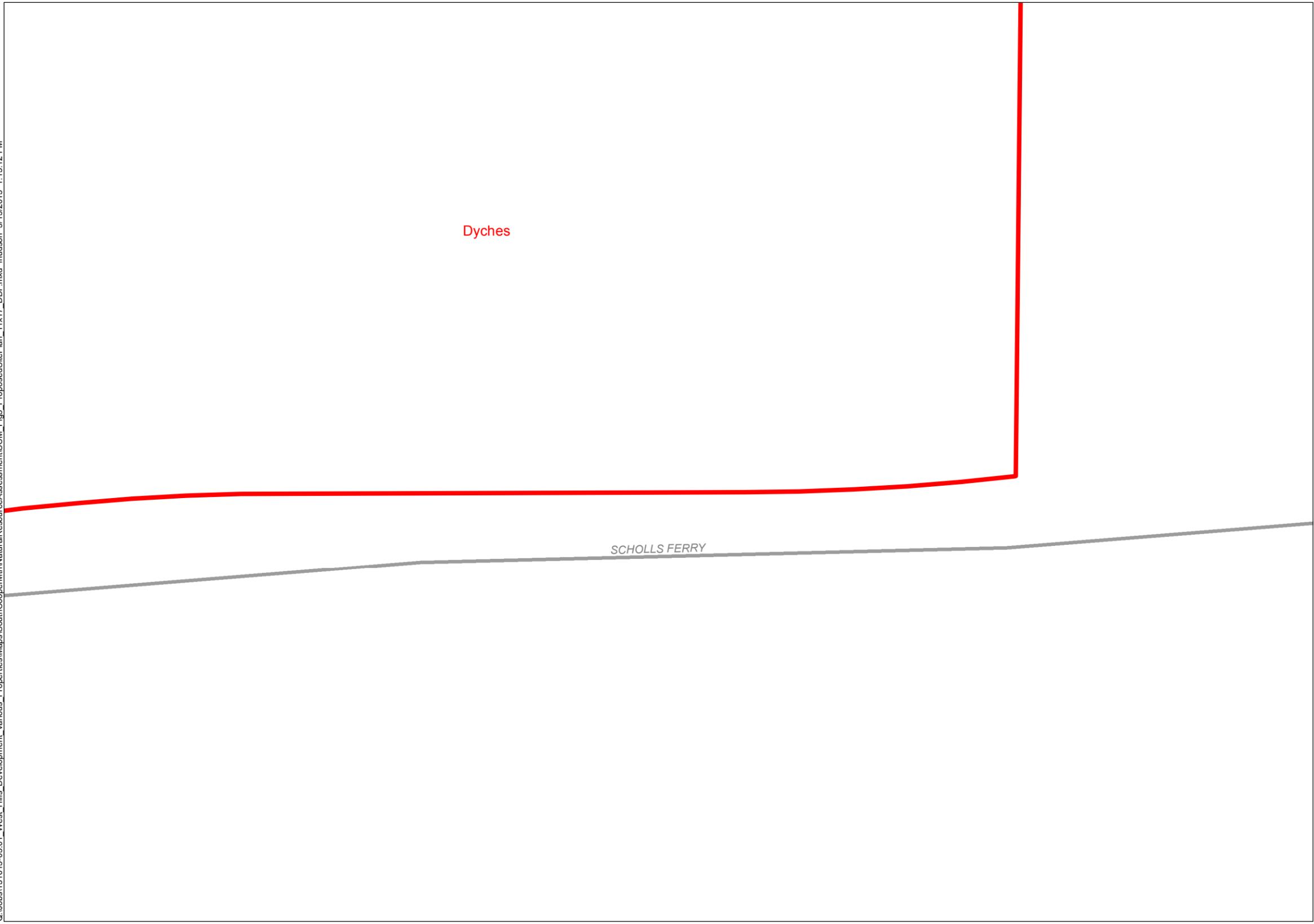
0 50 100 Feet

a	b	c	d
e	f	g	h
i	j	k	l
m	n	o	
p	q		

Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:15:10 PM



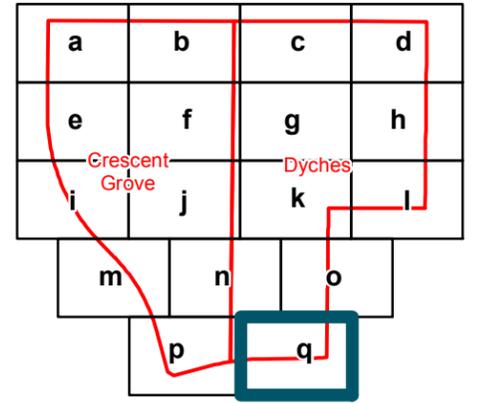
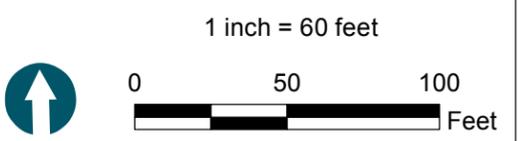
Q:\Jobs\131015-05.01\_West\_Hills\_Development\_Various\_Properties\Maps\SouthCooperMtnNaturalResourceAssessment\SCM\_Fig5\_ProposedSitePlan\_11x17\_DDP.mxd Ihudson 3/13/2015 1:15:12 PM

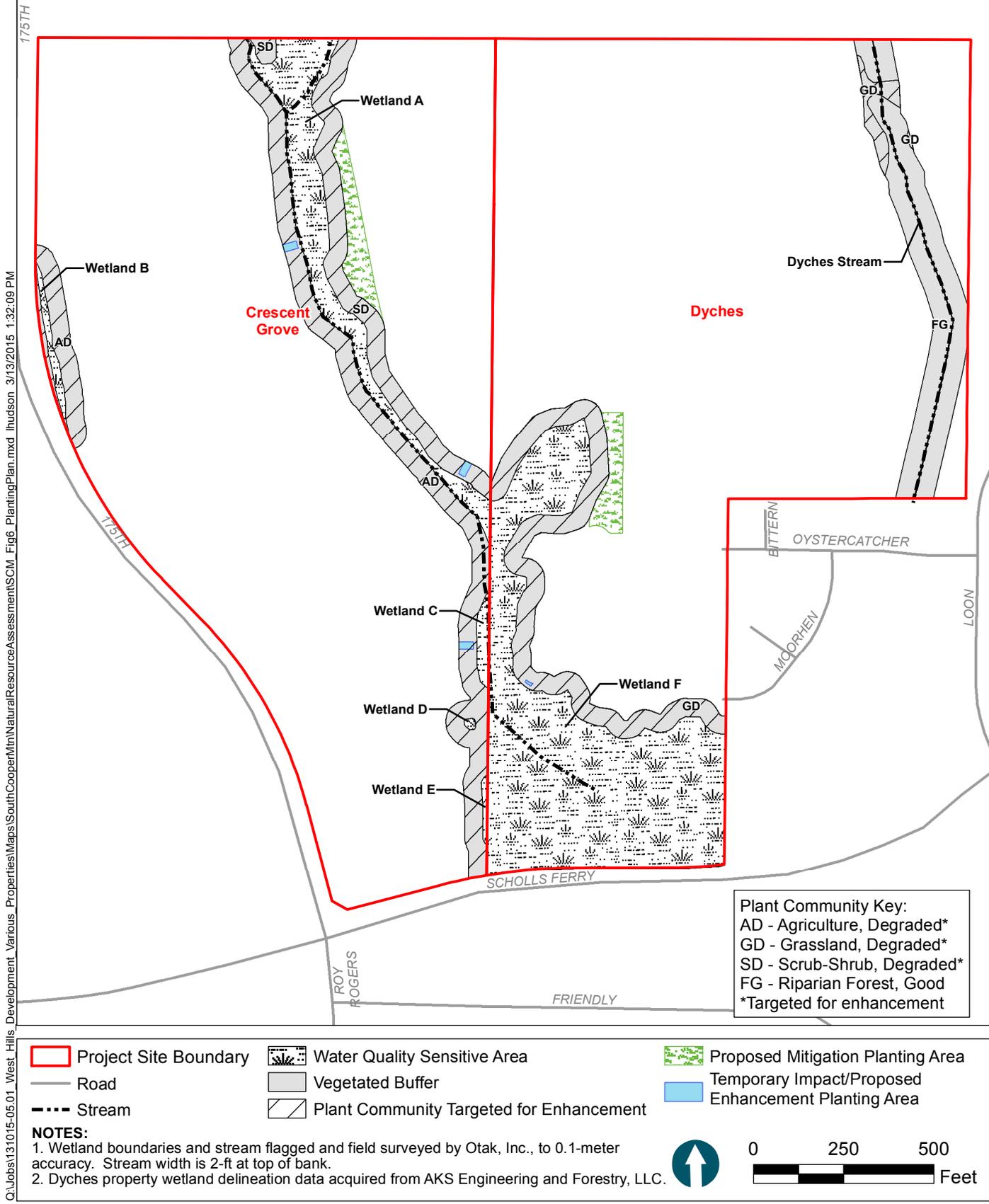


- Project Site Boundary
- Road
- Proposed Site Plan

Plant Community Key:  
AD - Agriculture, Degraded  
FG - Riparian Forest, Good  
GD - Grassland, Degraded  
SD - Scrub-Shrub, Degraded

**NOTE:**  
1. Site plan and areas of impact data acquired from Otak.





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**Figure 6**  
 Planting Plan  
 South Cooper Mountain Heights Natural Resource Assessment  
 Washington County, OR

APPENDIX A  
SOUTH COOPER MOUNTAIN CRESCENT  
GROVE PROPERTY WETLAND  
DELINEATION REPORT

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[Included in submittal binder as "Impact Study C"]



APPENDIX B  
DYCHES PROPERTY WETLAND  
DELINEATION REPORT

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[Included in submittal binder as "Impact Study C"]



APPENDIX C  
VEGETATED CORRIDOR COMMUNITY  
TYPE DATA SHEETS

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# VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333  
Portland, OR 97224  
Office: (503) 670-1108 Fax: (503) 670-1128

**PROJECT NAME:** South Cooper Mountain Heights

**DATE:** 2/11/2015

**LOCATION:** Beaverton, Wash Co.

**SAMPLING POINT:** DP-01

**INVESTIGATOR(S):** J. Payson, J. Fox, B. Baker

**COMMUNITY ID:** Agriculture

<u>Tree Stratum</u>	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)
1. None			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Tree Cover =		<u>0</u>	

**Vegetated Corridor Condition**

**Degraded**

<u>Sapling/Shrub Stratum</u>	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. None				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Total Shrub Cover =		<u>0</u>		

**Native Combined Cover**

Absolute Cover (%)

Tree = \_\_\_\_\_

Shrub = \_\_\_\_\_

Herb = \_\_\_\_\_

Total Cover = 0

**Tree Canopy Cover**

Absolute Cover (%)

Total Cover = 0

<u>Herb Stratum</u>	Plot Size: <u>r = 10ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. Trifolium species		20	N	N
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Total Herb Cover =		<u>20</u>		

**Percent Invasives**

Absolute Cover (%)

Tree = n/a

Shrub = \_\_\_\_\_

Herb = \_\_\_\_\_

Total Cover = 0

<b><u>Corridor Condition Parameters</u></b>	
Good	>80% Native Combined Cover and >50% Tree Canopy Exists
Marginal	50-80% Native Combined Cover and 26-50% Tree Canopy Exists
Degraded	<50% Native Combined Cover and <25% Tree Canopy Exists

**Comments:**

Clover cover crop. No other vegetation present in agriculture field.

Plant species not listed as native in the Metro Plant List or local Native Plant List (or not identified to species) and therefore not counted in native combined cover calculations [(CWS R&O 07-20 Section 3.14.5 (e)(1))].

# VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333  
 Portland, OR 97224  
 Office: (503) 670-1108 Fax: (503) 670-1128

**PROJECT NAME:** South Cooper Mountain Heights

**DATE:** 2/11/2015

**LOCATION:** Beaverton, Wash Co.

**SAMPLING POINT:** DP-02

**INVESTIGATOR(S):** J. Payson, J. Fox, B. Baker

**COMMUNITY ID:** Grassland

Tree Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)
1. None			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Tree Cover =		<u>0</u>	

**Vegetated Corridor Condition**

Degraded

**Native Combined Cover**

Absolute Cover (%)

Tree = \_\_\_\_\_

Shrub = \_\_\_\_\_

Herb = 2

Total Cover = 2

**Tree Canopy Cover**

Absolute Cover (%)

Total Cover = 0

Sapling/Shrub Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. None				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Total Shrub Cover =		<u>0</u>		

**Percent Invasives**

Absolute Cover (%)

Tree = n/a

Shrub = \_\_\_\_\_

Herb = \_\_\_\_\_

Total Cover = 0

Herb Stratum	Plot Size: <u>r = 10ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. Unidentified graminoids and forbes		20	--	--
2. Rumex crispus		2	N	N
3. Juncus effusus		2	Y	N
4. Chamerion angustifolium		T		
5. Vicia species		T		
6.				
7.				
8.				
9.				
10.				
Total Herb Cover =		<u>24</u>		

<b><u>Corridor Condition Parameters</u></b>	
Good	>80% Native Combined Cover and >50% Tree Canopy Exists
Marginal	50-80% Native Combined Cover and 26-50% Tree Canopy Exists
Degraded	<50% Native Combined Cover and <25% Tree Canopy Exists

**Comments:**

The majority of the site is covered in 80-85% wood chips and mowed vegetation hindering plant identification.  
 Plant species not listed as native in the Metro Plant List or local Native Plant List (or not identified to species) and therefore not counted in native combined cover calculations [(CWS R&O 07-20 Section 3.14.5 (e)(1))].

# VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333  
Portland, OR 97224  
Office: (503) 670-1108 Fax: (503) 670-1128

**PROJECT NAME:** South Cooper Mountain Heights

**DATE:** 2/11/2015

**LOCATION:** Beaverton, Wash Co.

**SAMPLING POINT:** DP-03

**INVESTIGATOR(S):** J. Payson, J. Fox, B. Baker

**COMMUNITY ID:** Scrub-shrub

Tree Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)
1. <u>Crataegus monogyna</u>		20	N
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
Total Tree Cover =		20	

**Vegetated Corridor Condition**

**Degraded**

**Native Combined Cover**

Absolute Cover (%)

Tree = \_\_\_\_\_

Shrub = \_\_\_\_\_

Herb = 10

Total Cover = 10

Sapling/Shrub Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. <u>Crataegus monogyna</u>		40	N	N
2. <u>Rubus armeniacus</u>		15	N	Y
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Shrub Cover =		55		

**Tree Canopy Cover**

Absolute Cover (%)

Total Cover = 20

**Percent Invasives**

Absolute Cover (%)

Tree = n/a

Shrub = 15

Herb = \_\_\_\_\_

Total Cover = 15

Herb Stratum	Plot Size: <u>r = 10ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. <u>Unidentified graminoids and forbes</u>		65	--	--
2. <u>Poa species</u>		25	--	--
3. <u>Polystichum munitum</u>		10	Y	N
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Herb Cover =		100		

<b><u>Corridor Condition Parameters</u></b>	
Good	>80% Native Combined Cover and >50% Tree Canopy Exists
Marginal	50-80% Native Combined Cover and 26-50% Tree Canopy Exists
Degraded	<50% Native Combined Cover and <25% Tree Canopy Exists

**Comments:**

Various winter grasses and forbes.  
Plant species not listed as native in the Metro Plant List or local Native Plant List (or not identified to species) and therefore not counted in native combined cover calculations [(CWS R&O 07-20 Section 3.14.5 (e)(1))].

# VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333  
Portland, OR 97224  
Office: (503) 670-1108 Fax: (503) 670-1128

**PROJECT NAME:** South Cooper Mountain Heights

**DATE:** 2/11/2015

**LOCATION:** Beaverton, Wash Co.

**SAMPLING POINT:** DP-04

**INVESTIGATOR(S):** J. Payson, J. Fox, B. Baker

**COMMUNITY ID:** Scrub-shrub

Tree Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)
1. <u>Crataegus monogyna</u>		35	N
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
Total Tree Cover =		35	

**Vegetated Corridor Condition**

Degraded

**Native Combined Cover**

Absolute Cover (%)

Tree = \_\_\_\_\_

Shrub = \_\_\_\_\_

Herb = 20

Total Cover = 20

**Tree Canopy Cover**

Absolute Cover (%)

Total Cover = 35

Sapling/Shrub Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. <u>Rubus armeniacus</u>		60	N	Y
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Shrub Cover =		60		

**Percent Invasives**

Absolute Cover (%)

Tree = n/a

Shrub = 60

Herb = \_\_\_\_\_

Total Cover = 60

Herb Stratum	Plot Size: <u>r = 10ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. <u>Unidentified graminoids and forbes</u>		60	--	--
2. <u>Poa species</u>		20	--	--
3. <u>Polystichum munitum</u>		20	Y	N
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
Total Herb Cover =		100		

<b><u>Corridor Condition Parameters</u></b>	
Good	>80% Native Combined Cover and >50% Tree Canopy Exists
Marginal	50-80% Native Combined Cover and 26-50% Tree Canopy Exists
Degraded	<50% Native Combined Cover and <25% Tree Canopy Exists

**Comments:**

Various winter grasses and forbes.  
Plant species not listed as native in the Metro Plant List or local Native Plant List (or not identified to species) and therefore not counted in native combined cover calculations [(CWS R&O 07-20 Section 3.14.5 (e)(1))].

# VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333  
 Portland, OR 97224  
 Office: (503) 670-1108 Fax: (503) 670-1128

**PROJECT NAME:** South Cooper Mountain Heights

**DATE:** 2/11/2015

**LOCATION:** Beaverton, Wash Co.

**SAMPLING POINT:** DP-05

**INVESTIGATOR(S):** J. Payson, J. Fox, B. Baker

**COMMUNITY ID:** Scrub-shrub

Tree Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)
1. None			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Tree Cover =		<u>0</u>	

**Vegetated Corridor Condition**

**Degraded**

**Native Combined Cover**

Absolute Cover (%)

Tree = \_\_\_\_\_

Shrub = \_\_\_\_\_

Herb = 4

Total Cover = 4

Sapling/Shrub Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. Crataegus monogyna		40	N	N
2. Cytisus scoparius		25	N	Y
3. Ilex aquifolium		15	N	N
4. Rubus armeniacus		T		
5.				
6.				
7.				
8.				
9.				
10.				
Total Shrub Cover =		<u>80</u>		

**Tree Canopy Cover**

Absolute Cover (%)

Total Cover = 0

**Percent Invasives**

Absolute Cover (%)

Tree = n/a

Shrub = 25

Herb = \_\_\_\_\_

Total Cover = 25

Herb Stratum	Plot Size: <u>r = 10ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. Poa species		60	--	--
2. Unidentified graminoids and forbes		30	--	--
3. Pteridium aquilinum		2	Y	N
4. Daucus carota		2	N	N
5. Tanacetum vulgare		2	N	N
6. Conyza canadensis		2	Y	N
7. Vicia species		2	--	--
8.				
9.				
10.				
Total Herb Cover =		<u>100</u>		

Corridor Condition Parameters	
Good	>80% Native Combined Cover and >50% Tree Canopy Exists
Marginal	50-80% Native Combined Cover and 26-50% Tree Canopy Exists
Degraded	<50% Native Combined Cover and <25% Tree Canopy Exists

**Comments:**

Various winter grasses and forbes.  
 Plant species not listed as native in the Metro Plant List or local Native Plant List (or not identified to species) and therefore not counted in native combined cover calculations [(CWS R&O 07-20 Section 3.14.5 (e)(1))].

# VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333  
Portland, OR 97224  
Office: (503) 670-1108 Fax: (503) 670-1128

**PROJECT NAME:** South Cooper Mountain Heights

**DATE:** 2/11/2015

**LOCATION:** Beaverton, Wash Co.

**SAMPLING POINT:** DP-06

**INVESTIGATOR(S):** J. Payson, J. Fox, B. Baker

**COMMUNITY ID:** Scrub-shrub

Tree Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)
1. None			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Tree Cover =		<u>0</u>	

**Vegetated Corridor Condition**

Degraded

**Native Combined Cover**

Absolute Cover (%)

Tree = \_\_\_\_\_

Shrub = 5

Herb = \_\_\_\_\_

Total Cover = 5

Sapling/Shrub Stratum	Plot Size: <u>r = 30ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. Crataegus monogyna		25	N	N
2. Rubus armeniacus		10	N	Y
3. Alnus rubra		5	Y	N
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Total Shrub Cover =		<u>40</u>		

**Tree Canopy Cover**

Absolute Cover (%)

Total Cover = 0

**Percent Invasives**

Absolute Cover (%)

Tree = n/a

Shrub = 10

Herb = \_\_\_\_\_

Total Cover = 10

Herb Stratum	Plot Size: <u>r = 10ft</u>	Absolute Cover (%)	Native? (Y/N)	Invasive? (Y/N)
1. Poa species		50	--	--
2. Unidentified graminoids and forbes		50	--	--
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
Total Herb Cover =		<u>100</u>		

<b><u>Corridor Condition Parameters</u></b>	
Good	>80% Native Combined Cover and >50% Tree Canopy Exists
Marginal	50-80% Native Combined Cover and 26-50% Tree Canopy Exists
Degraded	<50% Native Combined Cover and <25% Tree Canopy Exists

**Comments:**

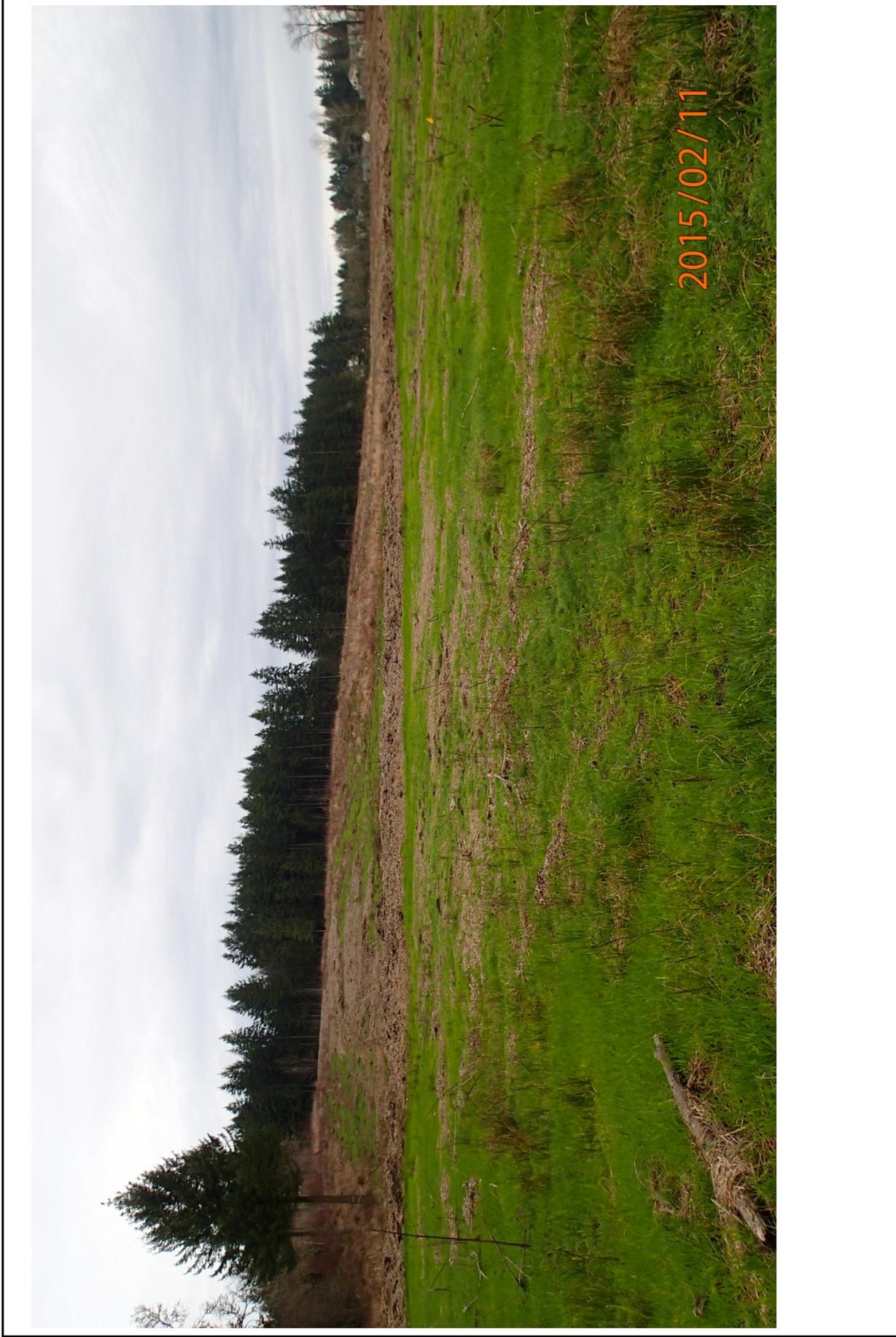
Various winter grasses and forbes.  
Plant species not listed as native in the Metro Plant List or local Native Plant List (or not identified to species) and therefore not counted in native combined cover calculations [(CWS R&O 07-20 Section 3.14.5 (e)(1))].

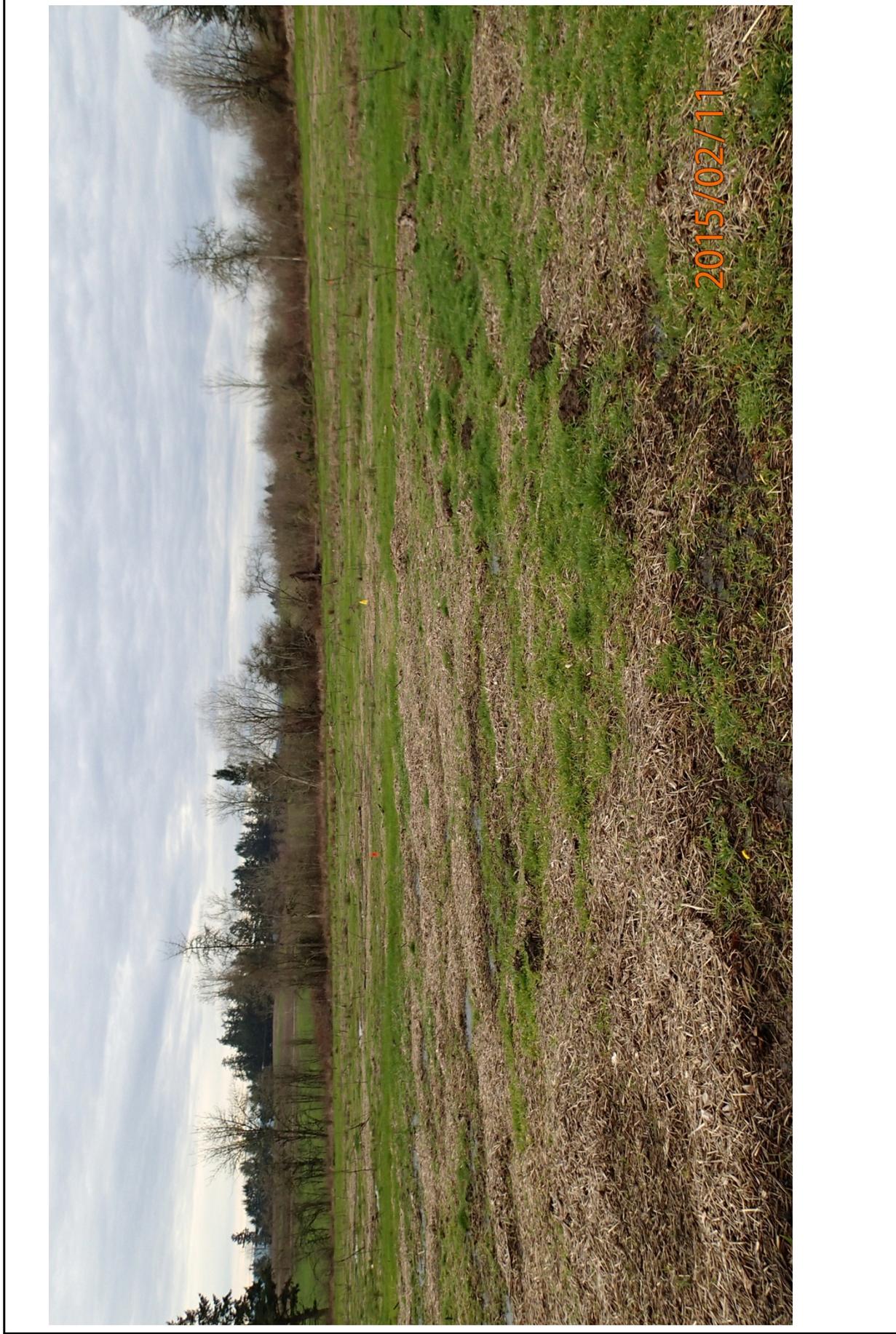
APPENDIX D  
STUDY AREA PHOTOGRAPHS

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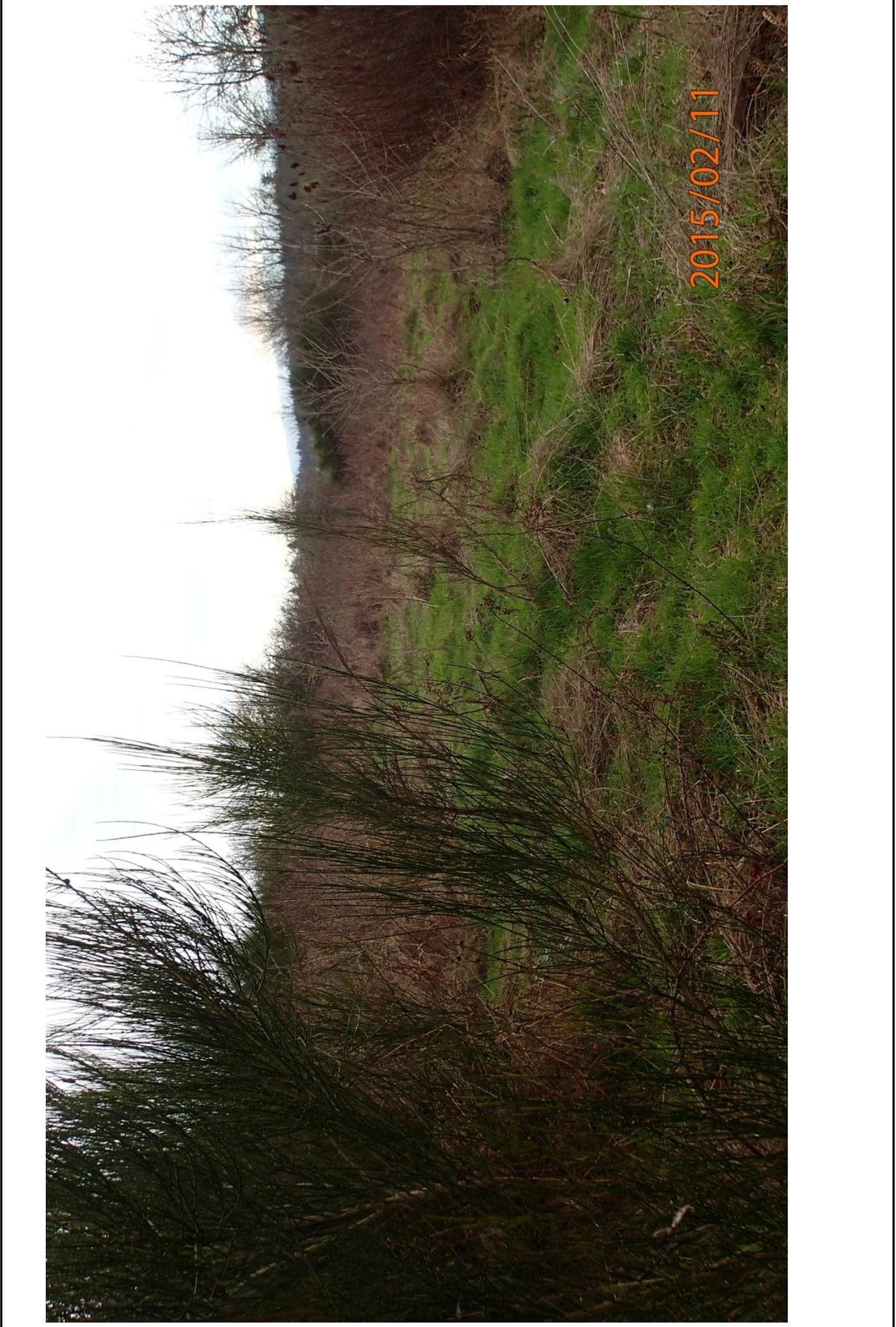




2015/02/11



2015/02/11







**Appendix D, Photo 9**  
Wetland 1 East Boundary – Shrub-scrub Vegetated Corridor (Degraded Condition)  
Natural Resources Assessment Report  
West Hills Development – South Cooper Mountain Heights