SITE CONSERVATION PLAN

Grant Butte Wetlands Natural Area



August 2018

Metro

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy, and sustainable transportation and living choices for people and businesses in the region. Voters have asked Metro to help with the challenges and opportunities that affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to providing services, operating venues and making decisions about how the region grows. Metro works with communities to support a resilient economy, keep nature close by and respond to a changing climate. Together, we're making a great place, now and for generations to come.

Stay in touch with news, stories and things to do.

www.oregonmetro.gov/connect

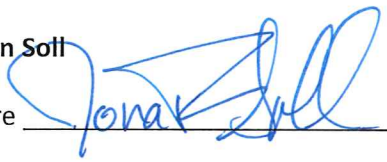
Grant Butte Wetlands Natural Area

Approvals for Site Conservation Plan

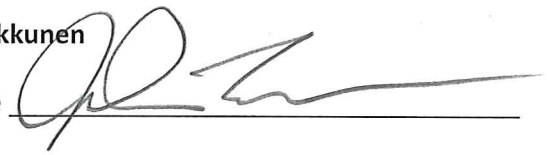
Date first routed: 10/22/18

Please return to Lori Hennings (Primary author: Kate Holleran)

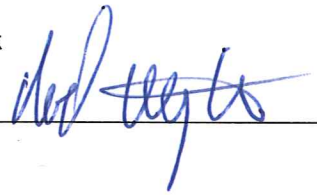
Jonathan Soll

Signature  Date 10/24/2018

Justin Takkunen

Signature  Date 12/10/18

Rod Wojtanik

Signature  Date 11/2/2018

Dan Moeller

Signature  Date 11/8/18

TABLE OF CONTENTS

Section 1: Introduction **1**

Section 2: Planning process summary **2**

Section 3: Existing conditions **3**

Section 4: Conservation **11**

Section 5: Strategic restoration and stewardship **14**

Section 6: Visitor experience and opportunities **23**

Section 7: Coordination **26**

Section 8: Maps **28**

Appendix A: Historical context **40**

Appendix B: Conservation in detail **41**

Appendix C: Species list **50**

Appendix D: Reference and other resources **51**

Maps

Map 1 – Vicinity
Map 2 – Site map
Map 3 – Topography
Map 4 – Soils
Map 5 – Hydrology
Map 6 – Historical vegetation
Map 7 – Current cover
Map 8 – Conservation targets
Map 9 – Stewardship class
Map 10 – Management status
Map 11 – Access and potential development areas

SECTION 1: INTRODUCTION

CONTEXT

The 50-acre Grant Butte Wetlands (Grant Butte Wetlands Natural Area) occupies a former pasture along Fairview Creek as well as portions of the northern and eastern slopes of Grant Butte located south of NW Division Street and east of SE 190th Avenue in Gresham, Oregon. The natural area is part of the historic lands that have been used by the Indigenous people of the area. In the most recent past much of the natural area was a farm, the Gatenbein Dairy. The wetlands, adjacent field, and upland forested portions of the Butte form the headwaters of Fairview Creek (Map 1), which drains to the north. Surrounding natural features include the 658-foot Grant Butte to the west and 430-foot Berry Hill to the east. The east property line follows the centerline of Fairview Creek. Metro and the City of Gresham are joint owners of approximately 33 acres, and East Multnomah Soil and Water Conservation District contributed funds toward the purchase of the same 33 acres within the site (the former dairy farm parcels).

The wetlands extend south onto property owned by the City of Gresham, which are managed for conservation values. (Map 1). Together, Grant Butte Wetlands Natural Area and City of Gresham properties harbor a remnant population of Western painted turtles *(Chrysemys picta*), as well as a variety of other wetland-dependent wildlife such as northern red-legged frog (*Rana aurora*), northwestern salamander *(Ambystoma gracile*), river otter *(Lontra canadensis*), and wetland bird species such as American bittern *(Botaurus lentiginosus*), wood duck *(Aix sponsa)*, and common yellowthroat *(Geothlypis trichas*).

Grant Butte Wetlands Natural Area and adjacent public natural areas are unusual in providing closely-juxtaposed riparian, wetland, prairie and upland forest habitats accessible to urban Gresham neighborhoods. The Gresham-Fairview Trail, a regional multi-use path, runs north - south on the eastside of Grant Butte Wetlands Natural Area. NW Division St. is served by frequent bus service. Surrounding development includes commercial, as well as single- and multi-family residential land uses.

This site conservation plan (SCP) is a tool for protecting and enhancing the natural characteristics of the site. It includes a history of the site, as well as an overview of existing conditions, key ecological attributes, conservation targets, and management priorities. It also considers the site in relation to surrounding lands, human activity, and adjacent conservation properties. Since the recent acquisitions in 2014, 2016 and 2018 with funding from Metro's 2006 natural areas bond measure, restoration treatments have focused on weed control, native planting, and enhancing habitat for turtles.

GOALS AND OBJECTIVES OF THE CONSERVATION PLAN

The goal of this conservation plan is to describe and prioritize actions to protect and enhance Metro's Grant Butte Wetlands Natural Area as a conservation resource for Gresham, east Multnomah County, and the wider Portland metropolitan region. With a diverse mix of native habitats and wildlife and accessible to urban residents, Grant Butte Wetlands also represents a special opportunity for nature education and interpretation.

SECTION 2: PLANNING PROCESS SUMMARY

PLANNING AREA

The site consists of the following tax lots, including: 1S3E08A00400, 1S3E08A00300, 1S3E08A00200, and 1S3E08A00100 that front on NW Division; 1S3E08A00800 and 1S3E08A00801 that lie at the southeast corner of the property; and 1S3E0800200, 1S3E08A00700, 1S3E08A05700,1S3E08A05800 and 1S3E08A06100 that extends up the slope of Grant Butte. The tax lots composing the farm were acquired by Metro and the City of Gresham in 2014, with matching funds from East Multnomah Soil and Water Conservation District. The one-acre tax lot 1S3E08A00400 at 3140 NW Division St was acquired by Metro in the summer of 2016; it has an existing 1,712 square-foot house built in 1948 and a garage built in 1999. The remaining tax lots were acquired from the Rockwood People's Utility District in 2018 with contribution from East Multnomah Soil and Water Conservation District.

At the time of the Metro acquisition, the farm property had a large barn, garage, and other out buildings. All these structures were in poor condition and were deconstructed and removed in 2014 as part of Metro's site stabilization efforts. The City of Gresham zoning for six of the tax lots (the former farm) is moderate commercial (MC) and for the remaining lots the zoning is low density residential (DLR5, LDR7). There are no water rights associated with the Grant Butte Wetlands Natural Area properties according to the Oregon Water Resources Department Water Rights Information Query.[1]

Grant Butte Wetlands is among Metro's most accessible sites to Gresham residents. The site fronts on a major regional transportation arterial, NW Division St., with sidewalks and a bus stop serviced by a high-frequency bus line. Eventually, NW Division St. is expected to support a bus-rapid transit line with a station along the site's frontage on Division as well as other bike, pedestrian, and related safety and traffic improvements. An old skid road provides access to the forested slopes of Grant Butte across tax lot 1S3E0800200, which connects with the water storage property owned by the City of Gresham on the south flank of Grant Butte.

Diverse land uses surround Grant Butte Wetlands Natural Area. Low-density commercial uses extend along NW Division St. To the immediate north of this commercial corridor there are large aggregate gravel mining pits. To the immediate northeast of Grant Butte Wetlands Natural Area is a commercial storage facility first developed in 1977 and expanded in 1987 on three acres of fill that occupy a portion of the historical wetland or floodplain area. Grant Butte Wetlands Natural Area is flanked to the east and northwest by single-family and multi-family residential lands, and to the south and southwest by publicly-owned, limited-access open space properties. The southeast property line is flanked by an abandoned railroad bed, which is closed to public access but is occasionally used by birders with permission from the City of Gresham. The Gresham-Fairview trail passes to the immediate east of Grant Butte Wetlands Natural Area but does not directly abut the natural area.

[1] http://apps.wrd.state.or.us/apps/wr/wrinfo/Default.aspx?t=1

PLANNING PROCESS

A site conservation plan (SCP) articulates Metro's strategy for providing future conservation, enhancement and management of natural resources on site in accordance with the intent and purpose of the voter-approved 2006 natural areas bond measure and regional and local conservation priorities. It incorporates an understanding of historical land use, management and restoration; the physical and social context; and the current natural resource conditions and key ecological attributes. The SCP establishes conservation targets, their desired future condition and related threats, and details and prioritizes actions for enhancement, restoration and monitoring as well as considerations for public engagement, adaptive management, human access and visitor experience. The SCP is not a master plan, rather it sets a foundation for future master planning. Any future master planning process will engage stakeholders and the public in planning specific site improvements based on available resources, community engagement, and the intent and purpose of voter-approved funding measures.

SECTION 3: EXISTING CONDITIONS

This section summarizes the existing conditions at Grant Butte Wetlands Natural Area including the history and current landscape conditions. This includes geology, geomorphology, hydrology, natural habitats, native biodiversity, invasive species, historical land-use and the current social and neighborhood context.

PHYSICAL ENVIRONMENT

Geology and soils

Unlike Gresham's many other buttes, Grant Butte is not a confirmed lava dome with a cinder cone. The nearby presence of the Grant Butte fault line suggests that it was formed from folds in the Troutdale Formation. Grant Butte and the surrounding landscape were subsequently shaped by the Pleistocene-era Missoula floods, which created well-drained fluvial deposits throughout east Multnomah County, particularly around buttes and hills that pre-dated the floods. Fluvial deposits can be found in the soils on the slopes of Grant Butte, underlying the prairie and wetland areas.

Soils mapped by the USDA Soil Conservation Service for Grant Butte Wetlands Natural Area are summarized in Table 1 (Green 1983) and illustrated in Map 4. A mix of well-drained Multnomah silt-loams dominate almost three-quarters of the site on the butte and prairie portions. The wetlands are underlain by poorly drained Wapato silt loams. Small patches of Latourell loam are present in the SE corner of the site.

Past investigation of soil profiles on Gresham property immediately to the south of Grant Butte Wetlands Natural Area revealed areas inconsistent with the USDA Soil Conservation Service soil mapping. Areas of predominantly organic soils were found, particularly in those areas closer to floodplain and mapped wetland edges. In those areas, past soil cores taken to depths of over five feet showed layers of peat interspersed with thin, silty to sandy layers. Soil cores taken more distant from floodplain and wetland edges showed soil conditions more consistent with soils described in the USDA Soil Conservation Service maps. Future master planning process may need to conduct bore tests in areas proposed for excavation-related activities.

Table 1. Mapped soil units, acres, and descriptions for Grant Butte Wetlands natural area (derived from Green 1983 and the USDA SCS Web Soil Survey).

MAP UNIT SYMBOL	MAP UNIT NAME	SLOPES	ACRES	PERCENT OF SITE	DESCRIPTION
25B	Latourell loam	3-8%	3.03	0.1%	Well-drained soil formed in medium textured alluvium on broad terraces, at elevations of 50-400 ft. Vegetation is Douglas-fir, Oregon white oak, bigleaf maple, western redcedar, vinemaple, western hazel, common snowberry, trailing blackberry, oceanspray, roses, grasses, and forbs.
25D	Latourell loam	15-30%	2.2	6.4%	Well-drained soil formed in medium textured alluvium on convex slopes of broad terraces, at elevations of 50-400 ft Slopes of 0-3% on elevations of 150-300 ft. Vegetation is Douglas-fir, Oregon white oak, bigleaf maple, trailing blackberry, oceanspray, roses, grasses, and forbs.
29A	Multnomah silt loam	0-3%	8.5	24.7%	Well-drained soil formed in stratified gravelly or cobbly alluvium on broad, convex terraces, at elevations of 150-400 ft. Vegetation is Douglas-fir, Oregon white oak, bigleaf maple, western red cedar, vinemaple, western hazel, common snowberry, trailing blackberry, oceanspray, roses, grasses, and forbs.
29C	Multnomah silt loam	8-15%	7.7	22.4%	Well-drained soil formed in stratified gravelly or cobbly alluvium on broad, convex terraces, at elevations of 150-400 ft. Vegetation is Douglas-fir, Oregon white oak, bigleaf maple, western redcedar, vinemaple, western hazel, common snowberry, trailing blackberry, oceanspray, roses, grasses, and forbs.
29E	Multnomah silt loam	30-60%	22.0	28.7%	Well-drained soil formed in stratified gravelly or cobbly alluvium on side slopes of broad terraces, at elevations of 150-400 ft. Vegetation is Douglas-fir, Oregon white oak, bigleaf maple, western redcedar, vinemaple, western hazel, common snowberry, trailing blackberry, oceanspray, roses, grasses, and forbs.
55	Wapato silt loam	0-3%	6.1	17.8%	Poorly-drained hydric soil formed in recent alluvium on floodplains, at elevations of 100-600 ft. Vegetation is red alder, black cottonwood, Oregon ash, willow, western redcedar, trailing blackberry, common snowberry, sedges, rushes, and grasses.

Hydrology

Average annual precipitation in the Gresham-Troutdale area is approximately 45 inches, with 87 percent occurring as rainfall between the months of October and May (NOAA National Weather Service, Troutdale, Oregon cooperative weather station, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?or8634).

Water rights filed by Arthur W. Grant in 1957 for the parcels directly to the south of Grant Butte Wetlands Natural Area indicate there are at least two springs at the base of Grant Butte. These springs feed the 120-acre wetland complex on the east flank of the Butte, which are part of the headwaters of the 7,000-acre Fairview Creek urban watershed that drains north through the cities of Gresham and Fairview to Columbia Slough at Fairview Lake.

Early Government Land Office (GLO) land survey records from the 1850s document a marsh or wetland in the low areas northeast of Grant Butte with no evidence of a natural drainage channel connecting to either Johnson or Fairview creeks. During development of the area for agriculture in the 1870s, Grant Butte Wetland was ditched and drained to the north and, for a time, to the south. As road and residential development in the area proceeded, additional ditching, drainage, and filling of wetlands occurred. Appendix A presents a more thorough history of hydrologic alterations of Grant Butte Wetlands.

Most developed properties adjacent to Grant Butte Wetlands Natural Area were constructed with connections to the storm drain network, and/or contain porous soils that prevent stormwater runoff from flowing directly onto the site. One stormwater facility, located at the corner of SW Sandlewood Loop and SW Second St., collects runoff from neighboring properties and drains to Fairview Creek Headwaters. There is also an outfall to the wetlands draining from an emergency overflow from the City of Gresham's drinking water reservoir to the west.

Since at least 2001, rising groundwater at the base of Grant Butte has been observed by residents and City of Gresham staff, leading to expanded open water areas and the death of riparian trees. The precise cause of this apparent increase remains unknown.

MAJOR HABITAT TYPES

Current cover types at Grant Butte Wetlands Natural Area include 7.8 acres of emergent wetlands, 12.5 acres of prairie (previously a farm pasture), 28.5 acres upland forest, and one acre of existing developed land with a single-family home and driveway (Map 7). The north end of the prairie/pasture land includes three acres formerly developed with homes and out-buildings for the old dairy.

Wetlands

The wetlands and other waterways and buffers occupy 7.8 acres on the east side the property, and include open water and vegetated riparian areas as well as emergent vegetation. Fairview Creek runs north-south along the whole length of the wetland mosaic, with substrates dominated by fine sediments typical of Pacific Northwest depressional wetlands.

At the north end of the property, the channel centerline defines the property boundary with the commercial storage facility to the east. On the east bank of the channel, off of public lands property, there is a scattered line of riparian trees (mostly red alder [*Alnus rubra*] and exotic maples) with a high level of English ivy (*Hedera spp*.) and Himalayan blackberry (*Rubus armeniacus*). Farther south the channel widens and is bordered on the east and south by emergent wetlands.

Within the emergent wetland areas along the main channel, reed canarygrass (*Phalaris arundinacea*) dominates with a mix of other wetland plants described in detail in the local wetlands inventory conducted by Pacific Habitat Services for the City of Gresham (Small and Farrelly, 2015). Wetland vegetation and soils extend into the prairie via one broad swale in the north and two smaller ones at the south end of the property. At the far southeast corner of the property – where the prairie abuts the wetland – there is a man-made berm constructed of native fill material that limits inundation of the prairie.

The emergent wetland conservation target is slightly larger in acreage than the local wetlands inventory and is not meant to formerly designate wetlands. Instead it defines where Metro will enhance and protect wetlands and open water. It provides for a buffer along the wetland and open water areas.

Prairie

Grant Butte Wetlands Natural Area includes approximately 12.5 acres of former pastureland that now functions as degraded prairie habitat. It supports a mix of mostly non-native herbaceous open meadow species including tall (*Festuca arundinacea*) and red fescue (*Festuca rubra*), meadow foxtail (*Alopecurus pratensis*), reed canarygrass, creeping buttercup (*Rananculus repens*), and other grasses and forbs.

Separate from the main wetland area described above, there are four isolated shallow depressions that support wetland plants within the prairie/former pasture land. Due to their small size, these features are not identified on the included maps, and are treated as inclusions within the larger prairie habitat area.

Along NW Division St. at the north end of the property are approximately three acres of degraded grassland, which were formerly developed with two houses, a barn and out-buildings for the old dairy. The soils here appear particularly compacted and include some coarse fill material.

Given the small size, geographic location and highly degraded condition of the prairie, restoration work will focus on non-native invasive weed control and increasing native plant representation but will not strive to achieve a good or very good condition for this conservation target.

Upland Forest

The Grant Butte Wetlands Natural Area includes 28.5 acres of native upland forest on the slopes of Grant Butte and another one-acre stand of mixed native and exotic trees at the northwest corner of the property along NW Division St. These two disconnected patches of forest differ significantly in their size, topographic setting, and species composition.

The larger upland forest patch on the eastern slope of Grant Butte is composed of mixed deciduous-coniferous forest. Historical aerial photos show that the majority of forest resources of Grant Butte were clear-cut at least twice since initial homesteading began in 1850.

Dominant overstory trees are bigleaf maple (*Acer macrophyllum*) and red alder, with scattered Douglas-fir (*Pseudotsuga menziesii*) and grand fir (*Abies grandis*). Understory tree and tall shrub species include native vine maple (*Acer circinatum*), beaked hazelnut (*Corylus cornuta*), red elderberry (*Sambucus racemosa*), oceanspray (*Holodiscus discolor*), and Indian plum (*Oemleria cerasiformis*) as well as non-native English hawthorn, English holly, sweet cherry (*Prunus avium*), and an unidentified species of birch. Native low shrub and groundcover species include sword fern (*Polystichum munitum*), stinging nettle (*Urtica dioica*), thimbleberry (*Rubus parviflorus*), trailing blackberry (*Rubus ursinus*), and snowberry (*Symphoricarpus albus*).

Non-native species dominating the understory include Himalayan blackberry, English ivy, herb Robert (*Geranium robertianum*), and traveler's joy (*Clematis vitalba*). At the edge of wetlands and

prairie on the lower slope of the Butte, the overstory includes black cottonwood (*Populus balsamifera trichocarpa*) and Oregon ash (*Fraximus latifolia*), with red osier dogwood (*Cornus sericea)* in the understory. A headwater ravine passes through the upland forest patch but it does not appear to support open channel flow likely due to the small catchment area and porous soils.

The one-acre forest stand at the northwest corner of the property includes a mix of mature native and non-native trees, many of which likely were planted. Unlike the larger upland forest patch on the slopes of Grant Butte, this stand has no understory vegetation with the exception of grass and a few non-native shrubs. Large tree specimens include two old-world cedars (*Cedrus deodara* and *Decrus libani*), several western redcedars (*Thuja plicata*) and Douglas-firs, a sequoia (*Sequoiadendron giganteum*), red oak (*Quercus rubra*), monkey puzzle (*Araucaria araucana*), and bunya pine (*Araucaria bidwillii*). Scattered English holly, winged elm, and apple and cherry trees are also present.

Developed area

A one-acre developed area at the far northwest corner of the site includes an existing driveway and single-family residence that was acquired by Metro separately from the dairy property. The residential yard includes a lawn area and about a dozen ponderosa pines (*Pinus ponderosa*) planted after the 1962 Columbus Day storm.

VEGETATION AND WILDLIFE

Historic vegetation and land use

Historical vegetation maps compiled by Christy and Alverson (2011) from General Land Office (GLO) survey records represent a snapshot view of historical land cover at a moment in time when indigenous burning had ceased and before extensive land areas had been transformed by settlement and development (Map 6). Though imprecise, these maps accurately reflect major patterns and offer insights for contemporary conservation planning.

Historically, three plant communities predominated in the vicinity of Grant Butte Wetlands Natural Area. The northeast portion of the property was characterized as a "willow swamp…with ninebark, ash, and gravel or sand bars." Surrounding this wetland was an area characterized as "Douglas-fir woodland…with bigleaf maple, alder or dogwood…and a brushy undergrowth of hazel, vine maple, young fir, and bracken." The southern portion of Grant Butte Wetlands Natural Area was mapped as burned-over conifer forest dominated by Douglas-fir, hemlock, redcedar, grand fir, bigleaf maple and other species, including yew (*Taxus brevifolia*), Pacific dogwood (*Cornus nuttallii)*, white oak (*Quercus garryana*), red alder.

Few details are known about historical agricultural uses at the site. The site was possibly used for the collection of first foods by area indigenous communities. An easement from farmer Israel Vance to Oregon Water and Power Company for Bull Run Water was recorded in 1889, suggesting that the site may have been farmed at that time. Henry C. Gantenbein acquired the property for a dairy in 1948 from Frederick Sprattan.[2] The Gantenbeins pastured roughly 100 dairy cows on the site for forty-two years from 1948 until 1990 when dairy operations ceased. After 1990 the property was

[2] Laura Foster interviews with Grimm family members, August 2014.

grazed by a smaller herd of beef cows. After Henry Gantenbein died in 2003, his daughter, Darlene Gantenbein Grimm, and her husband, Ed Grimm, owned the property and pastured horses on it until the property was sold in 2014.[3] For more details regarding historical alteration drainage of the wetlands, please refer to Appendix A – Historical Context.

Invasive plants

A plant list assembled for Grant Butte Wetlands Natural Area (Appendix C) identifies 86 species observed on site. Eighteen species are confirmed to be invasive or potentially invasive. Reed canarygrass (*Phalaris arundinacea*) is abundant across the floodplain.

In upland forest areas, invasive tree species include sweet cherry, English hawthorn (*Crataegus monogyna*), and English holly (*Ilex aquifolium*); other invasive species include English ivy (*Hedera spp*), traveler's joy (*Clematis vitalba*), spurge laurel (*Daphne laureola*), and herb Robert (*Geranium robertiana*). A thicket of winged elm (*Ulmus alata*) appears to be spreading within the 0.9-acre stand at the northwest corner of the site.

The degraded prairie and wetlands contain a number of invasive or potentially invasive species likely introduced during the former agricultural use of the site. These include yellow toadflax (*Linaria vulgaris*), tall fescue (*Schenodorus arundinaceus*), meadow foxtail (*Alopecurus pratensis*), tansy ragwort (*Senecia jacobaea*), birds-foot trefoil (*Lotus corniculatus*), creeping buttercup (*Ranunculus repens*), Queen Anne's lace (*Daucus carota*), Canada thistle (*Cirsium arvense*), lesser hawkbit (*Leontodon taraxacoides)*, and curly dock (*Rumex crispus*).

Wildlife

The wetlands at Grant Butte Wetlands Natural Area support numerous wildlife species. Much of the information summarized below and in Appendix C is derived from City of Gresham bird and turtle surveys as well as wildlife observations by site visitors, Metro, and Gresham staff.

Some 101 vertebrate species have been observed or are known to exist in the vicinity of Grant Butte Wetlands Natural Area (See Appendix C.1). Bird species (approximately 79 species) are best represented in this list, due to the popularity of the Grant Butte area with local birders and more systematic bird inventory data as compared to what exists for other taxa. There are no known systematic surveys for other animal taxa on the Grant Butte Wetlands Natural Area site, only reported observations, with the exception of focused surveys for western painted turtles. Avian, amphibian and turtle surveys may be implemented in the future. The City of Gresham has eight years of amphibian and reptile monitoring data (formal surveys) throughout the Fairview Creek Headwater parcels with the exception of the Grant Butte Wetlands Natural Area parcels.

Species with special status designations by the U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife (ODFW), or Oregon Biodiversity Information Center include northern red-legged frog, Western painted turtle, pileated woodpecker (*Dryocopus pileatus*), and willow flycatcher (*Empidonax traillii*). In addition, the Columbia Slough/Fairview Creek system provides habitat for western brook lamprey (*Lampetra richardsoni*), a state "Vulnerable" sensitive species. Another

[3] Laura Foster interviews with Grimm family members, August 2014.

notable native wildlife species that lacks any special management status is a population of American bitterns (*Botaurus lentiginosus*), which inhabit the wetlands.

Western painted turtles are classified as "Critically Sensitive" by ODFW and "Imperiled" (S2) by the Oregon Biodiversity Information Center. Monitoring and management of western painted turtles has been a major focus for the City of Gresham following the first discovery of turtle use of the site in 2007. This ongoing focus on turtle management is due in part to their sensitive status, and also to the turtles' remarkable ability to persist at Grant Butte Wetlands Natural Area within an otherwise urban land use setting.

Invasive non-native vertebrates that have been observed at Grant Butte Wetlands Natural Area include: nutria (*Myocastor coypus*), American bullfrog (*Lithobates catesbeianus*), Eastern gray squirrel (*Sciurus carolinensis*), European starling (*Sturnus vulgaris*), and feral cats (*Felis domesticus*).

SOCIAL ENVIRONMENT AND HUMAN ECOLOGY

The site currently experiences a low level of local use on existing trails, as well as occasional dumping and unauthorized camping. Unauthorized camps are removed when found. Metro's "Why No Dogs" sign is present but off-leash dogs have been observed at the site.

Changing demographics and housing stock availability in the vicinity of Grant Butte Wetlands Natural Area have important implications for future conservation and human use of the site. Specifically, they suggest a high and growing demand for usable open space. The potential for increasing unplanned use of the natural area may complicate Metro's ability to protect the conservation targets.

Multi-family housing and associated demand for usable open space is likely to increase in conjunction with development of high capacity transit along NW Division especially near stops like the one proposed immediately in front of the site and across the street from NW Eastwood Avenue. Finally, houselessness is growing in Gresham and east Multnomah County. Human activities on-site and in adjacent publicly-owned natural areas are indicative of the existing and latent demand summarized above. Understanding these existing conditions is critical to managing access to achieve conservation goals and capturing community stewardship and education opportunities.

RECENT MANAGEMENT

Metro has implemented a number of site stabilization activities since taking over management of Grant Butte Wetlands Natural Area. The dairy barn, three houses, garages and other outbuildings were deconstructed and removed in 2014. Most of these buildings had become weathered and dilapidated, posing potential hazards. In attempt to control and discourage unauthorized access, Metro constructed a cable barrier and planted native vegetation along the Division St. frontage and collaborated with the City of Gresham and Rockwood PUD to identify all potential access points. Weed removal on site has focused on Himalayan blackberry, English holly, and English ivy in the upland forest with removal of Canada thistle and some other pasture and riparian weeds in the

wetland and pastureland. Metro also altered the vegetation on approximately one acre of the prairie/pastureland at the base of the Butte to improve turtle nesting habitat.[4]

Friends of Grant Butte Wetlands has informally monitored human use of Grant Butte Wetlands Natural Area and adjacent natural areas. According to the Friends some local residents use the old road as a walking trail. Other individuals have created new off-road cycling trails on portions of adjacent butte properties. The forested butte slopes at Grant Butte Wetlands Natural Area and adjacent public properties have had and may still be used for camping by houseless residents and illegal dumping. This type of use has declined since Metro began implementing site stabilization and since the City of Gresham has joined with regional partners to adopt a more formalized program to address houselessness and to clean up camp and dump sites. However, houselessness may continue to create a management challenge on the site.

NATURAL RESOURCES OF SPECIAL INTEREST

The resident Western painted turtle population is probably the most important natural resource of special interest at Grant Butte Wetlands Natural Area. The shallow wetland waters provide typical Western painted turtle habitat for rearing, basking and for winter hibernation while adjacent uplands provide suitable nesting areas. The City of Gresham became aware of the population in 2007 however local residents had observed them for much longer.

Surveys and observations have documented painted turtles using both aquatic and terrestrial habitats at Grant Butte Wetlands Natural Area, the latter being particularly important for nest excavation and egg deposition. Turtles have been observed nesting in sparsely vegetated areas in the field as well as in the surrounding area. Areas that provide compact, well-drained soils with little or no vegetation are typically preferred by painted turtles. According to the Oregon Conservation Strategy "Guidance for Conserving Oregon's Native Turtles, including Best Management Practices," turtles usually nest within 325 feet of occupied aquatic habitat.

A recent study geo-tracked painted turtles using Fairview Creek Headwaters and documented that turtles are actively using the surrounding upland areas including the field at Grant Butte Wetlands Natural Area. The survey also documented turtles traveling north of NW Division St. to scout for nesting sites.

[4] Grant Butte Stabilization Plan, Kate Holleran, June 24, 2014

SECTION 4: CONSERVATION

This section provides an overview of the conservation framework used to prioritize restoration and management at Grant Butte Wetlands Natural Area. A detailed description of this framework is provided in Appendix B. The conservation framework generally follows The Nature Conservancy's Conservation Action Planning template (TNC 2007), which includes analyzing the site, establishing conservation targets, evaluating key ecological attributes for each conservation target, analyzing threats affecting conservation targets, and developing and prioritizing strategies and action plans to abate serious threats.

CONSERVATION TARGETS

Conservation targets are species, groups of species, and habitats or plant communities that represent and encompass the array of native biodiversity at a site, relate to local and regional conservation goals, and are viable or feasible to restore (TNC 2007). Map 8 illustrates the conservation targets at Grant Butte Wetlands, which are: upland forest, prairie, emergent wetlands, and native turtles. Native turtles use at least two of the three habitat targets.

Native upland forest, prairie, and emergent wetlands are closely juxtaposed at Grant Butte Wetlands Natural Area, which affords Metro the opportunity to reconnect these habitats across the property and with adjacent conservation area managed by the City of Gresham. Though constrained to the north and east by urban development, there are also opportunities to preserve and enhance the site's aquatic and terrestrial habitat connectivity downstream (northward) along Fairview Creek and to a lesser extent southward to Johnson Creek.

Grant Butte Wetlands Natural Area conservation targets are described briefly in Table 2. We catalog the acreages of existing cover types, conservation targets, stewardship types, and management status categories in Table 3.

Table 2. Current status and generalized desired future condition of Grant Butte Wetlands Natural Area conservation targets.

TARGET	CURRENT STATUS	DESIRED FUTURE CONDITION
Upland Forest	FAIR – Degraded by invasive vegetation (small trees, shrubs and ground cover) with few large trees and sparse snag and downed wood.	GOOD – A diverse mixed-age native forest community, including standing dead and downed wood, and a restored native shrub and understory plant community.
Emergent Wetlands	POOR – Ditched and filled along its edges, which has reduced or eliminated shallow and seasonal wet areas. Reed canarygrass dominates the vegetation cover within the wetland, and nonnative riparian trees and shrubs predominated on the periphery, limiting the recruitment of large logs to the wetland.	FAIR – A diverse native wetland plant community with a restored shrub community at the margins and large wood to serve as turtle basking sites. Improved lateral connectivity to adjacent uplands and riparian areas, and to downstream environments in Fairview Creek.
Prairie	POOR – Degraded by past agricultural practices, including plowing, grading, and the introduction of nonnative pasture grasses and forbs, which now dominate the site.	FAIR – Invasive vegetation is contained and under control, supporting upland turtle habitat (though native grass and forb species may not dominate).
Native Turtles	Unknown: Present on site but limited data about the population use of the site. Basking/hiding structures and appropriate nesting sites are limited.	Good: sufficient basking and hiding structures along Fair View Creek, and improved nesting substrates based on improved understanding of habitat opportunities at the site

Table 3. Summary of current cover, conservation targets, stewardship type, and management status for Grant Butte Wetlands Natural Area. The total acreage reported below is calculated from GIS, which differs slightly from the deed or survey recorded acreage reported above.

CURRENT COVER	ACRES
Prairie	12.6
Upland Forest	28.5
Emergent Wetland	7.8
Developed – Impervious	1.0
Total	**49.9**

CONSERVATION TARGET	ACRES
Prairie	12.6
Upland Forest	28.5
Emergent Wetland	7.8
No Target	1.0
Total	**49.9**

STEWARDSHIP TYPE	ACRES
Prairie	12.6
Upland Forest	28.5
Wetland	7.8
Developed	1.0
Total	**49.9**

MANAGEMENT STATUS	ACRES
1 – Initiation	49
9 - No Targets (Developed)	.9
Total	**49.9**

KEY ECOLOGICAL ATTRIBUTES

Key ecological attributes (KEAs) are characteristics of a conservation target that, if missing or altered, would lead to the loss of that target over time (The Nature Conservancy, 2007). KEAs define the conservation target's viability. They are the biological or ecological components that most clearly define or characterize the conservation target, limit its distribution or determine its variation over space and time. They are the most critical components of biological composition, structure, interactions and processes, and landscape configuration that sustain a target's viability or ecological integrity. KEAs are rated from poor to good. This rating helps establish the restoration goals and guide Metro in development of restoration actions for the conservation targets.

Currently, most KEAs at Grant Butte Wetlands Natural Area are rated 'poor' with the exception of one that scored 'fair' for upland forest vegetative structure. Over the next ten years, with active stewardship and restoration, Metro aims to shift most KEA scores towards 'fair' or even 'good' ratings. Appendix B, Tables 4a-d describe the KEAs and their ratings for Grant Butte Wetlands Natural Area.

THREATS AND SOURCES

Numerous threats impact conservation targets at Grant Butte Wetlands Natural Area, affecting the site's long-term ecological health. These threats include: historical land conversion for agriculture; development on/adjacent to the site; introduction of nonnative species; wetland ditching, filling, and flow modification; and human disturbance from pets including dogs, illegal dumping, houseless encampments, and trail abuse or construction.

Most threats at Grant Butte Wetlands Natural Area were ranked as medium, except for "human disturbance from ongoing uses" ranked low, and threats from past land management practices and ongoing invasive species challenges in the prairie that were ranked high. The threats and sources summary (see Appendix B, Tables 5a-c) can be used to prioritize restoration actions and future management at Grant Butte Wetlands.

CLIMATE CHANGE CONSIDERATIONS

Climate change is anticipated to elevate summer average and extreme high temperatures, extend growing seasons, alter wet-season storm events and runoff patterns, and further constrain water availability during droughts. Current scientific assessments suggest that flashier stream runoff patterns may proliferate during the fall-winter wet season although the largely groundwater fed wetlands may mean these changes are minimal at Grant Butte Wetlands Natural Area.

With longer, more pronounced summer drought seasons, tree growth may be reduced and the risk/severity of wildfires could increase. Other indirect effects of climate change could include increased erosion, invasion of opportunistic native and non-native species, extirpations of less resilient native species, shifts in vegetation phenology, and alterations to pollination, dispersal, competition and predator-prey dynamics.

At the site level, the likelihood of native habitat and species persistence will be enhanced by restoration actions that: reduce habitat fragmentation, re-establish native drought-resistant

habitats (prairie), restore legacy habitat features that serve as refugia (downed wood and snags) and control invasive plants.

Across the matrix of surrounding developed lands, it is important to provide restored native habitats and viable corridors for the movement of flora and fauna. Grant Butte Wetlands together with adjacent City of Gresham Fairview Creek Headwaters and Rockwood PUD properties provide an important connection for the movement of organisms north to the Columbia River and south into the Johnson Creek watershed. The forested butte itself likely serves a similar function for migrating songbirds. Future management of the site should consider how habitat connections to neighboring conservation sites can be re-established or enhanced (see Map 1).

SECTION 5: STRATEGIC RESTORATION AND STEWARDSHIP

This conservation plan outlines strategic restoration and stewardship actions to be implemented at Grant Butte Wetlands Natural Area over the next ten years. Strategic restoration and stewardship actions are prioritized to address threats to conservation targets, but are general in nature and not highly prescriptive in order to provide Metro staff with operational flexibility during implementation.

Historical land management practices continue to exert legacy impacts on ecological conditions at Grant Butte Wetlands Natural Area. As a result, much of the site is in need of active restoration in order to improve key ecological attributes for the site's upland forest, emergent wetlands and waterways, prairie, and native turtles.

PRIORITIZED ACTIONS LINKED TO KEAS AND THREATS

For each of the four conservation targets, we describe prioritized conservation goals and actions that are linked to key ecological attributes (KEAs) and threats at the site. Table 4, below summarizes priority strategic actions at Grant Butte Wetlands Natural Area.

Upland Forest

Goals: Restore a more diverse mix of tree age classes, increase standing dead and downed wood levels, and restore native shrub and ground layers.

KEAs that are outside the desired range of natural variation include: reduced native shrub cover, and limited levels of standing and downed dead trees. Critical threats that jeopardize the viability of the upland forest conservation target are: past removal and manipulation of native habitats as well as ongoing human disturbance, which foster the spread of invasive vegetation and limit the recruitment and persistence of native species and old forest characteristics.

Strategic restoration and stewardship actions to address these threats:

- Reduce invasive plants to acceptable levels, especially those in the shrub and ground layers close to trails and access points.
- Re-vegetate areas treated for invasive weeds with native tree, shrub and ground layer species.

- Create standing dead and downed wood, and advance development of late-seral forest conditions. Manage densities through snag and down wood creation.
- Actively manage trails to promote access where desired, control erosion, prevent encroachment on native vegetation, and prevent the spread of invasive vegetation.
- Work in partnership with the City of Gresham and Rockwood PUD to align management goals and actions across ownership boundaries, especially around issues related to control of invasive vegetation and trail access/use.
- Collaborate with Friends of Grant Butte Wetlands and/or other community organizations to promote community stewardship and monitoring.

Emergent Wetlands

Goals: Increase native plant diversity and abundance. Increase basking and hiding structures. Improve upstream and downstream connectivity to adjacent habitats.

The wetland KEA that is outside the desired range of natural variation is 'buffer condition,' due to high cover of reed canary grass, invasive blackberry, and sparse tree cover by mostly non-native trees or decrepit red alder. This condition limits recruitment of large logs to the wetland to serve as basking sites for turtles, and native shrub cover to desired wildlife species (like songbirds, water birds, and beaver).

Strategic restoration and stewardship actions to address these threats:

- Plant patches of native shrub species on the west bank and within the wetland, and control reed canarygrass (as-needed) to promote re-establishment of a wetland shrub community.
- Place logs within the wetland to create sites for native turtle basking and hiding habitat for hatchlings.
- Work with neighbors and Soil and Water Conservation District to remove and control invasive plants, especially Himalayan blackberry and English ivy that proliferate on the east bank of the wetland (mostly off-property). Support restoration of native plants on adjacent properties after control of non-native invasives.
- Work in partnership with the City of Gresham to align management goals and actions across ownership boundaries, especially around issues related to control of invasive vegetation, trail access/use, and management of wetland hydrology.
- Collaborate with Friends of Grant Butte Wetlands and/or other community organizations to promote community stewardship and monitoring.

Prairie

Goals: Strategically control invasive weeds and stabilize existing open area to support upland turtle nesting habitats. Explore low-risk and modest cost opportunities to restore native prairie grass and forb cover in partnership with area stakeholders.

The prairie KEA that is outside the desired range of natural variation is 'native forb and grass abundance,' due to its small size and high cover of by nonnative pasture grasses.

Strategic restoration and stewardship actions to address these threats:

- Continue treatments and removal of invasive weeds.
- Stabilize the existing open ground habitat with the current mix of non-native grasses and explore opportunities to restore a mix of native grasses and forbs. Due to its small size, isolation from other prairie, and high levels of weed propagules originating from the surrounding urban area, Metro will not seek to fully restore native Northwest prairie at the site in the short-term.
- Implement turtle nesting habitat enhancements at northwest corner of prairie habitat area as described below, and manage prairie to maintain and restore connectivity for turtle migration between the adjacent wetland and upland forest.
- Collaborate with Friends of Grant Butte Wetlands and/or other community organizations to promote community stewardship and monitoring.

Native Turtles

Goals: Restore turtle nesting and basking habitats, and provide safe passage for turtles moving among habitats across the site and onto adjacent properties.

KEAs that are outside the desired range of natural variation include: distribution of viable nesting habitat and numbers of suitable basking sites. Critical threats that jeopardize the viability of native turtles at the site are: past removal of trees from the wetland riparian area and the proliferation of non-native orchard grasses in the prairie, which limit the availability of basking and nesting habitats. In addition, urbanization beyond the property limit turtle dispersal off-site, isolating the population and rendering it more vulnerable to catastrophic disturbances.

Strategic restoration and stewardship actions to address these threats:

- Place large logs in the wetland to serve as turtle basking sites, and replant native trees on the east shore of the wetland to serve as long-term sources of log recruitment. Limit shading of channel to ensure sufficient sun exposure. The City of Gresham worked with the Department of Environmental Quality (DEQ) to exclude the open water areas from shade targets to allow for basking sites.
- Utilize experimental treatments of ground scarification or placement of weed-free fill to reduce/eliminate vegetation cover in upland portions of the prairie and increase solar insolation in potential nesting areas.
- Minimize trail development within turtle nesting areas and seasonally limit public access to upland nesting and migration areas.
- Collaborate with Friends of Grant Butte Wetlands and/or other community organizations to foster positive human access such as community stewardship and monitoring.

Table 4. Threats and prioritized actions for conservation targets at Grant Butte Wetlands natural area.

CONSERVATION TARGET	KEA	THREAT	ACTION(S)	NOTES
All	Native plant cover	Invasive species	Integrated approach to the removal and control of invasive species, paired with monitoring and native vegetation restoration.	This will be an ongoing challenge for the entire natural area, beyond stabilization, due to the site's urban setting.
All	Human disturbance, including disturbance by dogs	Disturbance of native plants and wildlife; spreading invasive weeds	Short term: monitor and decommission new trails, remove dumps and camps. Collaborate with the City of Gresham and Rockwood Water Authority. Continue outreach with neighbors. Long-term: master plan process to determine appropriate level and type of access. Implement best management practices for reducing conflicts between site visitors and wildlife.	Metro will work to discourage illegal camping and work with stakeholders to address challenges in ongoing planning and to create active stewardship opportunities that prevent/reduce unauthorized and deleterious human uses.
Upland Forest	Tree age diversity and abundance of standing and downed wood	Past land management practices	Create snags and downed wood. Underplant a diverse mix of native tree and shrub species.	Requires planning to coordinate upland forest treatments and human access with plans for neighboring properties.
Native Turtles	Nest habitat distribution	Vegetation encroachment/ lack of solar insolation	Reduce pasture grasses and increase amount of exposed soil in designated turtle nesting habitat.	Will require periodic disturbance to prevent vegetative encroachment.

ONGOING STEWARDSHIP AND RESTORATION PROGRAMS

The following programs represent ongoing stewardship and restoration work needed at Grant Butte Wetlands Natural Area over the long-term, to maintain or improve the ecological conditions and processes that sustain the site's various conservation targets. All of these stewardship and restoration elements require close coordination with neighboring natural area managers (such as the City of Gresham and Rockwood PUD) and community organizations to align conservation planning and implementation at Grant Butte Wetlands Natural Area with actions happening at the larger landscape scale.

Access management

Due to the site's current levels of community interest and use, the potential for unauthorized camping, and the increasing demand for usable open space in Gresham (see Social Environment & Human Ecology, Section 3), managing access at Grant Butte Wetlands Natural Area is particularly important to achieving conservation goals and targets. Metro plans to work with our partners to develop a master plan for Grant Butte Wetlands Natural Area (see Long Term Strategies).

Prior to completion of a master plan, and its development of recommended site improvements access at the site will be managed according to the Intergovernmental Agreement between Metro, the City of Gresham and East Multnomah Soil and Water Conservation District, dated April 8, 2014.

Invasive species control

Initial weed control treatments under the 2016 Metro stabilization plan will continue at Grant Butte Wetlands Natural Area, and will eventually be more closely coordinated with efforts on the neighboring City of Gresham land. Metro will collaborate with the City of Gresham and stakeholders such as Friends of Grant Butte Wetlands to extend their existing invasive species removal efforts along the Gresham-Fairview Trail to Grant Butte Wetlands Natural Area.

Water monitoring and management

As with weeds, water management transcends ownership boundaries at Grant Butte and therefore will require close coordination with the City of Gresham, which manages the adjacent wetland property to the south of Metro's ownership.

Wildfire response plan

Metro will seek opportunities to collaborate with the City of Gresham to develop a coordinated wildfire response plan for all of the various Grant Butte properties in public ownership. Given the site's urban setting, there are numerous potential ignition sources and a coordinated wildfire response plan will enable managers to minimize risks and jointly invest in measures to protect public safety, public assets, and neighboring private properties.

Landscape connectivity

In collaboration with the City of Gresham, adjacent land managers and community stakeholders. Metro will work to enhance habitat connectivity in and adjacent to the Grant Butte area. Some important questions remain. What do we need to know about type and extent of water and wildlife flows to the north and south of Grant Butte Wetlands, as well as to and from the surrounding uplands? How can future infrastructure upgrades such as street improvements or water storage facilities impact site hydrology, habitat connectivity, and invasive species? What species use existing wildlife corridors and connections, especially culverts to the north and south? How might these connections be improved and managed to promote movement by desirable species and limit invasive species?

Table 5. Management actions, prioritization, sequencing, and costs at Grant Butte Wetlands Natural Area over the ten year implementation of the Metro site conservation plan.

CONSERVATION TARGET	THREAT	MANAGEMENT ACTIONS	PRIORITY	SEQUENCING	ESTIMATED COST
All	Invasive weeds	Map and prioritize invasive weed treatments on- and immediately off-property, in coordination with neighbors.	High	Ongoing and continuing	$35,000 ($1,000/acre over ten years)
		Implement removal and control treatments, and monitor initial treatments to refine and target subsequent actions.	High		
		Monitor site, new weed populations and treat where necessary. Minimize or contain traffic or material inputs that could deliver new weed propagules to the site.	High		
All	Human disturbance	Collaborate with stakeholders and neighboring landowners to develop a coordinated public access plan to actively manage human traffic into and across the site, with special emphasis on the NW Division St. access point.	High	Near term	$10,000 to support coordinated planning, signage, etc.
		Utilize signage, area closures, and collaborative community stewardship to discourage and curtail illegal camping and dumping, as well as other unauthorized human uses.	High		
Upland Forest	Past land management practices	Create snags and downed wood.	Low	Medium to long term	$7,000 for 1-2 treatments across 12.2 acres of upland forest
		Under-plant a diverse mix of native tree and shrub species, focusing on areas treated to remove invasive vegetation.	High	Ongoing and continuing	$20,000 ($4,000/acre over ~5 acres of upland forest)
Emergent Wetlands	Past ditching, filling, and manipulation of outflows	Re-establish native shrub cover on west side of wetlands, and native tree and shrub cover on east side of wetlands, bordering the commercial storage property and abandoned roadbed.	Medium	Medium to long term	$12,000 ($4,000/acre over ~3 acres of wetland)
All	Past land management practices	Evaluate wetland outflows and wildlife movement corridors (including those for invasive species) north and south in order to anticipate potential impacts and opportunities associated with pending and future transportation improvements along NW Division St. and Powell Blvd.	Low	Medium to long term	Undetermined
Prairie	Land conversion and past land management practices	Explore opportunities to restore Northwest native prairie forb and grass cover, concentrating initial efforts on areas treated for weeds and to enhance turtle nesting.	Medium	Medium to long term	$9,000 ($3,000/acre)
Native Turtle Habitat	Land conversion and past land management practices	Place large logs in wetland to re-create basking habitat.	High	Near term, in concert with wetland fill removal and bank re-contouring	$20,000 for log placements along 1800 linear feet; for project design, permitting, and excavator time
		Restore turtle nesting habitat using ground scarification, vegetation removal, and/or placement of clean, weed-free soil in uplands. Control encroaching vegetation to maintain solar insolation.	Medium	Medium to long term	$5,000 for a series of treatments across 2.6 acres of upland turtle nesting habitat overlay.
		Work with conservation and community partners to investigate and restore turtle migration corridors as needed, both on- and immediately off-site.	Low	Long term	Undetermined

ESTIMATED COSTS

Management actions, prioritization, sequencing, and estimated costs for the ten-year Grant Butte Wetlands Natural Area site conservation plan are detailed in Table 5, below. Estimated costs include Metro staff time for coordinated planning with neighboring landowners, managers, and community stakeholders, permitting and design, contracting fees, construction contingencies on time and materials, and project monitoring. We estimate that there are $118,000 in needed site stewardship costs at Grant Butte Wetlands Natural Area over the ten-year duration of the SCP.

Maps 9 and 10 show the distribution of stewardship classes and management status at Grant Butte Wetlands Natural Area. Stewardship class is a high-level, generalized land cover classification of all Metro properties, reflecting desired future conditions (DFC). Stewardship classes are not as specific as conservation target classes, and they include both natural and non-natural land covers.

Management status describes how far a given portion of a site is from desired future condition, with a score of "0" for those that are the farthest away from desired future condition, and "4" for areas currently at DFC. Areas lacking a conservation target are scored as "9" (unclassified). Table 6 defines Metro's management status categories.

Table 6. Conservation management status categories under the Metro site conservation planning framework.

MANAGEMENT STATUS	SCORE	TIMEFRAME	DESCRIPTION
Pre-initiation	0	N/A	Highly disturbed sites where restoration work has not been initiated. Few native plants typically present (farm fields, clear-cuts, oak woodlands/prairies with high levels of invasive/colonizing vegetation encroachment).
Initiation	1	0-3 years post-restoration	Sites under initial restoration establishment phase. Includes areas under treatment with tilling, mowing, grading, invasive species control and initial planting.
Establishment	2	3-8 years post-restoration	Sites undergoing treatments to reduce competition to vegetation planted or released during the initiation phase. Areas generally stay in this phase until priority native plants have established dominance over competing vegetation.
Consolidation	3	8-20 years post-restoration	Sites with developing native plant communities that require periodic management to reach the DFC (tree thinning, mowing and weed control).
Refinement and Long-term Maintenance	4	Indefinite	Sites that have reached their DFC or are on a clear path towards it, requiring only modest additional intervention.
Unclassified	9	N/A	Sites with unclassified conservation targets, representing developed areas.

MONITORING PLAN

Monitoring at Grant Butte Wetlands natural area is an integral part of a successful long-term management strategy, to guide restoration and stewardship activities. Monitoring will be implemented to evaluate habitat and population responses to management actions, and to chart progress towards achievement of long-term ecological objectives.

Monitoring addresses identified threats directly and indirectly, by tracking changes in certain ecological attributes (like percent cover by non-native invasive versus native vegetation). Metro's monitoring is conducted at various scales using different techniques, which typically include: remote sensing/GIS, field-based vegetation plots/transects, bird point counts, pond-breeding amphibian surveys, presence-absence (or abundance) surveys for key target flora/fauna, and photo points.

At Grant Butte Wetlands, a mix of monitoring techniques will be implemented by Metro to guide stewardship strategies for each of the four conservation targets.

All conservation targets

For the upland forest and emergent wetland, Metro will employ photo points, as well as remote sensing/GIS to chart gross changes in the structure and extents of vegetation every five years or less. Photo points will be installed in FY19.

Upland Forest

For the upland forest, Metro will use visual assessments to monitor percent native tree and shrub cover, as well as the development of standing and downed wood every ten years or less. A baseline estimate of native tree and shrub cover, and dead trees resources/acre will be established in FY19.

Emergent Wetlands

For the emergent wetlands, Metro will use visual assessments of vegetation both within wetland and in riparian areas, distinguishing between ground versus shrub layers. Assessments will be conducted every five years or less. In addition, Metro will periodically conduct pond-breeding amphibian egg-mass surveys.

Prairie

Metro will conduct presence-absence surveys for invasive weeds, and may use vegetation transects/plots to determine dominant vegetation, percent cover by native forbs and grasses, and percent area of woody vegetation (tree and shrubs). It is pertinent to note that this is a low priority prairie with a long term DFC of Fair (20-30% native plants).

Native Turtles

For native turtles, Metro will identify areas of potential nesting and basking habitat, taking into account previous surveys conducted by members of the Lower Willamette Turtle Recovery Working Group. Metro will survey for turtles and turtle use for a minimum of two years of baseline data, followed by post project monitoring as necessary. Additional survey work will be implemented if appropriate to inform development of formal public access.

LONG-TERM STRATEGIES

Over the long-term, Metro should seek to evaluate the success of its stewardship and management practices in relation to public use and experiences at the site. To what extent is the public's use of the site aiding or hindering Metro's ecological goals and objectives for the site? How can they be brought more into alignment?

The urban setting of Grant Butte Wetlands natural area poses unique management challenges and opportunities for Metro. Most Metro natural areas are located in rural or suburban-fringe settings, distant from the human population demographic mix that lies close to Grant Butte Wetlands natural area. At Grant Butte Wetlands, Metro has opportunities to explore stewardship partnerships with neighbors, other agencies, local tribes, community based organizations and funders. The details and limits of these opportunities remain to be determined, and will continue to evolve as Metro's relationship with potential partners and understanding of the site evolves.

The following actions will be considered over the long-term (potentially beyond the ten-year SCP period) to advance conservation at the site:

- Continue to coordinate with the City of Gresham and EMSWCD on managing and planning for access on the site and developing a comprehensive master plan for all public lands on Grant Butte.
- Acquire fee title or conservation easements from willing landowners on adjacent properties to expand and protect adjacent riparian and floodplain habitats fringing the wetlands.
- Assess the threats from invasive or feral mammals such house cats and nutria to wildlife and ecological conditions at the site, and actively manage these populations to reduce threats, if necessary and feasible.
- Work with Gresham and neighboring property owners to understand and improve conditions for wildlife passage at road crossings.

Access Master Plan

The abundance and growth of multi-family housing, demographic changes, and transportation improvements along NW Division, will combine to likely lead to a growing demand for public access to open space in close proximity to Grant Butte Wetlands Natural Area.

In the future, Metro plans to lead a master planning effort for Grant Butte Wetlands Natural Area to identify and guide the development of access improvements, like parking, trails and other natural area amenities while enhancing conservation goals. Managing the primary access to the site from NW Division and through the property onto the neighboring City of Gresham and PUD properties is critical to advance the conservation goals on Grant Butte Wetlands Natural Area and on adjacent public lands.

Strategically planning access to Grant Butte Wetlands Natural Area will help land managers control access to and protect the site's sensitive areas, and help meet the growing need for places to recreate and enjoy nature. It is recommended that the master plan be completed in partnership with the City of Gresham and that it include all the natural areas encompassing the butte and

wetlands. Metro will work closely with all adjacent land owners to ensure that the resulting plan is based on shared understanding of management needs for the entire butte. Metro should consider how it can align its goals for Grant Butte Wetlands Natural Area with the management goals and constraints on neighboring public lands. Land managers will benefit from shared resources and consistent management across ownerships to provide public access in a manner consistent with other site objectives. The Site Conservation Plan will serve as a framework for habitat protection during master planning.

SECTION 6: VISITOR EXPERIENCE OPPORTUNITIES

LANDSCAPE CHARACTER AND NATURE EXPERIENCE

Grant Butte is one of six buttes in the City of Gresham. Although it is not a volcanic lava dome, it shares many qualities of the other buttes. Grant Butte Wetlands Natural Area protects the scenic resource of the forested hillside, and helps create a sense of place. The natural features at Grant Butte Wetlands Natural Area are visible from the Berry Ridge Apartments to the east. The views south from the NW Division St. frontage to the wetlands and the butte are also striking and a valuable neighborhood resource. A visit to Grant Butte may include a variety of nature experiences.

Forested Butte

The topography of the site is one of the dominant features offering opportunities for hiking through a majestic upland forest. Mosses, ferns and shrubs all contribute to a lush northwest forest feel, and large trees provide shade. From the hillside, there are views of the wetlands below and Mount Hood in the distance.

Prairie

Although the prairie is a low ecological priority, it is a chance for people to experience a prairie setting. There may be an opportunity to enhance the existing prairie vegetation with showy native wildflowers that would provide pollinator habitat and delight visitors. Since the prairie is also a focus for creating turtle habitat, trail alignments will need to avoid nesting areas. Possible desired trail routes should be reviewed when planning turtle nest habitat to anticipate and avoid potential conflicts as soon as possible, and consider possibilities for viewing turtle nesting.

Wetland

Currently the wetlands are a draw for wildlife and bird enthusiasts. There may be an opportunity to provide some access to the wetland via a formalized trail and boardwalk that could focus access in particular areas, and discourage people from accessing the entire wetland and riparian area. Attention should be paid to where sensitive areas are for wildlife, and where the best opportunities are to see wildlife like basking turtles, frogs and birds.

Nature education

Having these three habitat types together in one location offers a unique opportunity to share how each benefits the region and how they are each important for various butte species, and during in different parts of some species' life cycles. Visitors to Grant Butte Wetlands Natural Area can experience an accessible native upland forest and a wildlife-rich wetland, and learn about the area's

geology and landscape evolution as well as past human uses of the site. Native turtles, frogs, and birds could be highlighted as Metro planners develop visitor infrastructure and programming.

Additionally, Grant Butte Wetlands Natural Area offers a good opportunity for Metro's Nature Education team to meet their goals of fostering people's relationships to nature with a racial equity lens. Science staff and planners should coordinate with the Nature Education team as planning for the site progresses.

PARKS AND NATURE RACIAL EQUITY GOALS

The accessibility of Grant Butte Wetlands Natural Area from nearby neighborhoods and by transit provide unique opportunities to implement mission-critical and core strategies identified in the Parks and Nature System Plan and the Parks and Nature Diversity, Equity and Inclusion Action Plan, in particular: "Ensuring that Metro Parks and Nature programs and facilities support the needs of underserved communities, including communities of color, low-income communities and young people."

Through numerous workshops, conversations, and a region wide survey of people of color, we have heard that the following are among the most significant barriers to accessing nature:

- Lack of awareness of where natural areas are and what people can do there
- Natural areas are too far away from where people live
- Natural areas are not accessible by transit

Demographics

Grant Butte is 1 ½ miles south of the center of Gresham's Rockwood Neighborhood, one of the region's most racially diverse and economically marginalized areas. Within the Metro Parks and Nature system of natural areas, this site is surrounded by the second-most densely populated neighborhood, with the fourth-lowest median household income (Metro DRC; 112 Metro managed, non-cemetery sites with 3-mile buffers).

In addition to being more convenient for individual visitors and families, Grant Butte Wetlands Natural Area would be a good place to expand the focus of Metro Parks and Nature's community partnerships. Several community partner organizations are located in the Rockwood area, and serve community members from nearby Grant Butte Wetlands Natural Area, making it a convenient place for them to bring their community members.

Transit

Grant Butte is on NW Division St., a major transportation corridor which currently has a frequent service bus line, and is slated to have a bus rapid transit stop along its nearly 700 foot long frontage.

Awareness

Grant Butte Wetlands Natural Area offers unique opportunities that address the barrier of people not being aware of parks and natural areas. First it is on a high use transit corridor, giving people the opportunity to see it as they drive by. Second, the area that fronts Division Street was formerly developed and therefore has relatively low ecological value. This provides both an opportunity for

ecological uplift, as well as an opportunity to provide amenities on the more developed end of the nature park spectrum, which could draw people in and provide a "gateway" to nature. There is also an opportunity to partner with the city or another organization to provide an amenity like community gardens, which is not a direct service that Metro provides, but could be a partnership opportunity and a way to raise awareness of the natural area. Third, the opportunity to raise capacity of community members to be liaisons to the site is high because of the site's convenient location.

STRATEGIC OPPORTUNITIES

The potential threats of unmanaged/unauthorized public access, as well as opportunities to leverage community stewardship and serve communities of color in the area have led to a strategic opportunity for Metro to consider as we plan for the future of the site.

Metro is working with a coalition of community partners, and other stakeholders to explore the possibility of a nature education and community-focused facility along the site's Division St. frontage. This community-led effort has the potential to meet the coalition's goals of serving communities in east Multnomah County, as well as to assist conservation efforts by providing additional community stewardship and visibility of the site. It is also an opportunity for Metro Parks & Nature to better serve communities of color in east Multnomah County. Metro science and planning staff have identified areas of relatively low conservation value that could potentially be part of a community-led development (see Map 11). Map 11 shows potential re-development areas but is preliminary and intended for feasibility planning only. All mapping is approximate, and is not based on surveyed information. All proposed boundaries are drafts and are conceptual, with refinement to occur during the master planning process and as community conversations progress.

SECTION 7: COORDINATION

KEY PARTNERS

Essential agency partners for SCP implementation include the City of Gresham and East Multnomah Soil and Water Conservation District. Both these agencies contributed to the purchase of Grant Butte Wetlands Natural Area and have natural resource programs and expertise that will be valuable for implementing the SCP. The City of Gresham is involved in active management and monitoring of Fairview Creek Headwaters and manages the Gresham-Fairview trail as well the majority of the other Grant Butte properties. The Friends of Grant Butte Wetlands are an important local community partner. In addition, the Rosemary Andersen High School East located at 182nd and NW Division has a "Natural Resources Pathway Project" that could be a great partner for implementing natural resource service learning opportunities at Grant Butte Wetlands Natural Area.

Audubon Society of Portland has partnered with the City of Gresham and Friends of Grant Butte Wetlands in leading trips in Fairview Creek Headwaters. They also manage the Backyard Habitat Certification program and often champion and promote other local conservation efforts through a variety of advocacy and educational programs. Audubon Society of Portland could be a key partner for on-site programing.

The Successful Families 2020 coalition, led by Self Enhancement Inc., a N/NE Portland social service organization, has expressed interest in strategic opportunities at Grant Butte Wetlands Natural Area.

KEY SCP STAKEHOLDERS

Below is a preliminary list of organizations who have expressed interest in Grant Butte Wetlands Natural Area.

Government, community and watershed groups

- City of Gresham (Natural Resource and Water Resource Divisions)
- East Multnomah Soil and Water Conservation District
- Audubon Society of Portland
- Confederated Tribes of Grand Ronde
- Friends of Grant Butte Wetlands
- Unite Oregon
- Self-Enhancement Inc
- Coalition of Communities of Color
- Springwater District Project of the East Metro Arts & Community Council (http://www.springwaterpcd.org)
- Columbia Slough Watershed Council
- Rosemary Anderson HS East

- Rockwood Community Development Corporation
- Centennial Neighborhood Association
- Rockwood Neighborhood Association
- Gresham Coalition of Neighborhoods

Connected street, trail or public right-of-way owners or authorities

- Gresham Transportation Division (NW Division)
- Gresham Parks Department (Gresham-Fairview Trail and parcels on Grant Butte)
- Pacific Corp (Gresham-Fairview Trail)

Adjacent property owners besides the City of Gresham

- Rockwood Water People's Utility District (19601 NE Halsey St., Portland 97230-7430)
- Gresham Mini Storage LLC (14855 SE 82nd Dr, Clackamas OR)
- Public Storage Income Fund (PO BOX 25025, Glendale, CA 91291-05925)
- Windsor Sunpointe Inc (710 NW 14th, 2nd Floor, Portland, OR 97209)

Other nearby businesses or property owners

- Cascade Athletic Club (19201 NW Division, Gresham, http://www.cascadeac.com/gresham/)
- Berry Ridge Apartments (http://www.gslberryridge.com)

PUBLIC INVOLVEMENT

As projects are developed, Metro will provide local stakeholders and residents surrounding Grant Butte Wetlands Natural Area with pertinent information about conservation work. Project information may include background on the project, timing, cost, material types, and other information as necessary to keep the public informed. A more comprehensive public involvement plan will be developed as part of the master planning process.

SECTION 8: MAPS

Map 1 Vicinity map showing neighboring properties and ownership.

Map 2 Site map

Map 3 Topography

Map 4 Soils

Map 4 Hydrology and low-lying areas with fill

Map 6 Historical vegetation (from Christy and Alverson 2011)

Map 7 Current cover

Map 8 Conservation targets

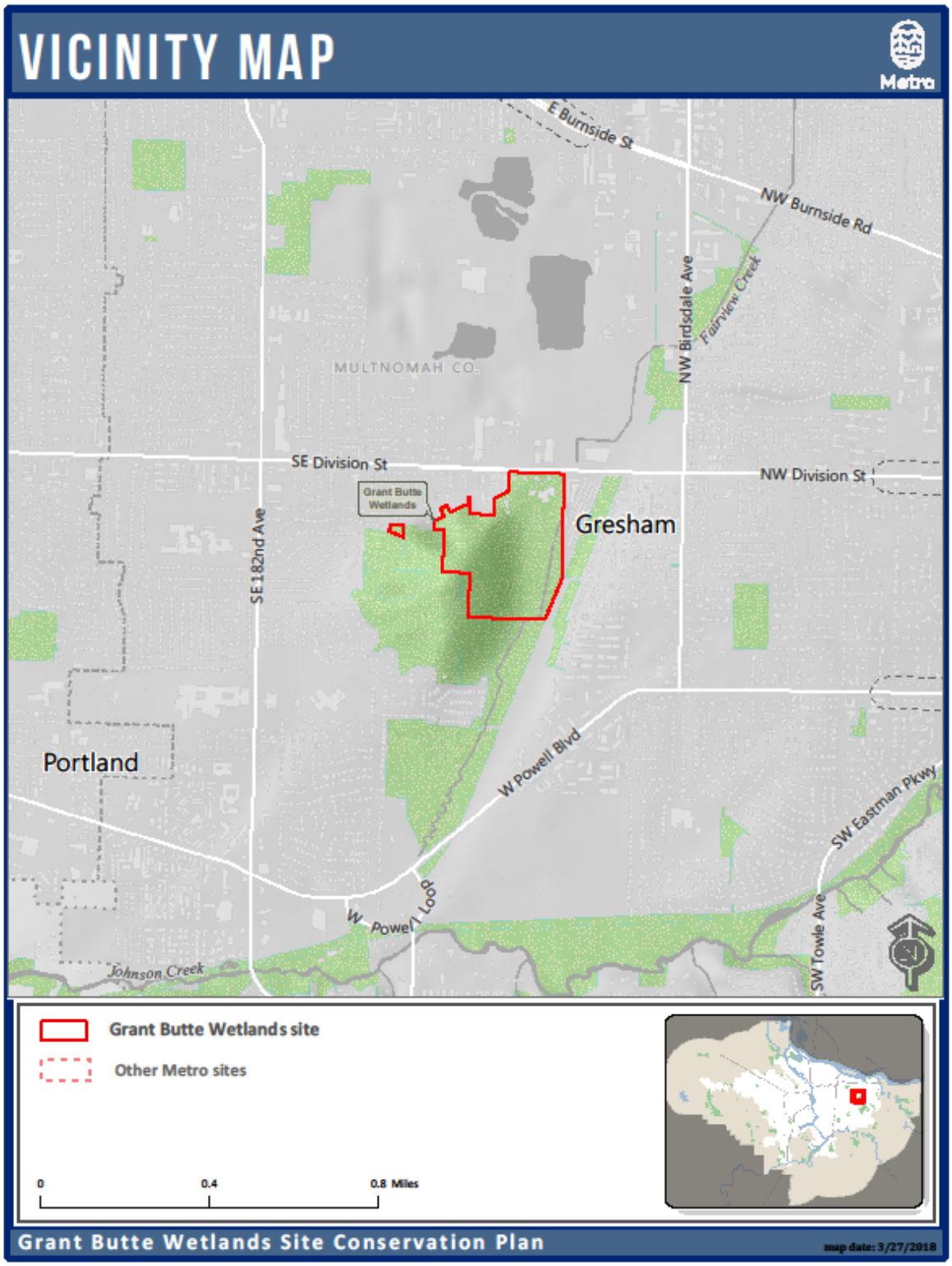
Map 9 Stewardship classes

Map 10 Management status

Map 11 Access and potential development areas.

MAP 1

GRANT BUTTE WETLANDS NATURAL AREA VICINITY MAP

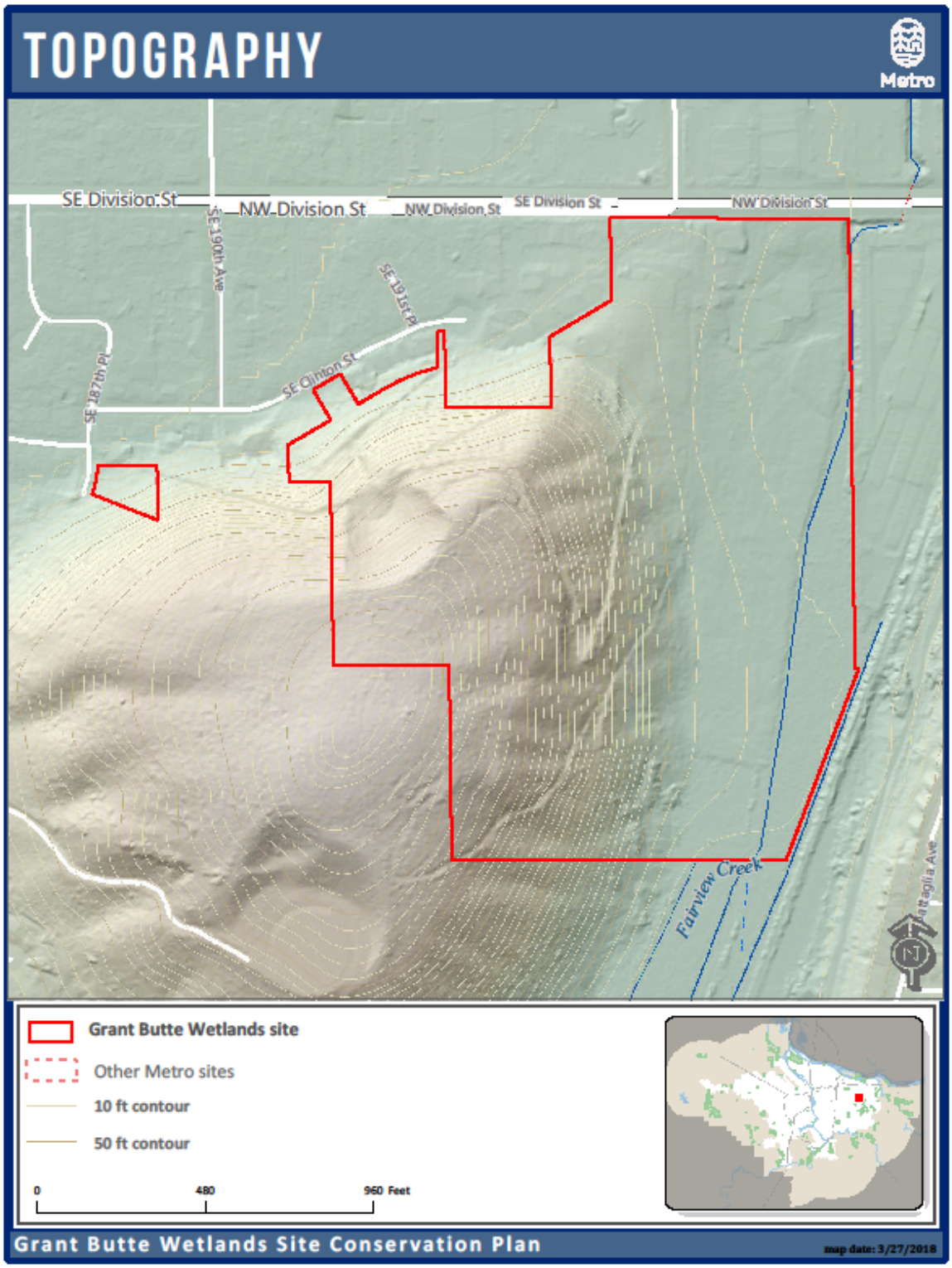


MAP 2

GRANT BUTTE WETLANDS NATURAL AREA SITE MAP

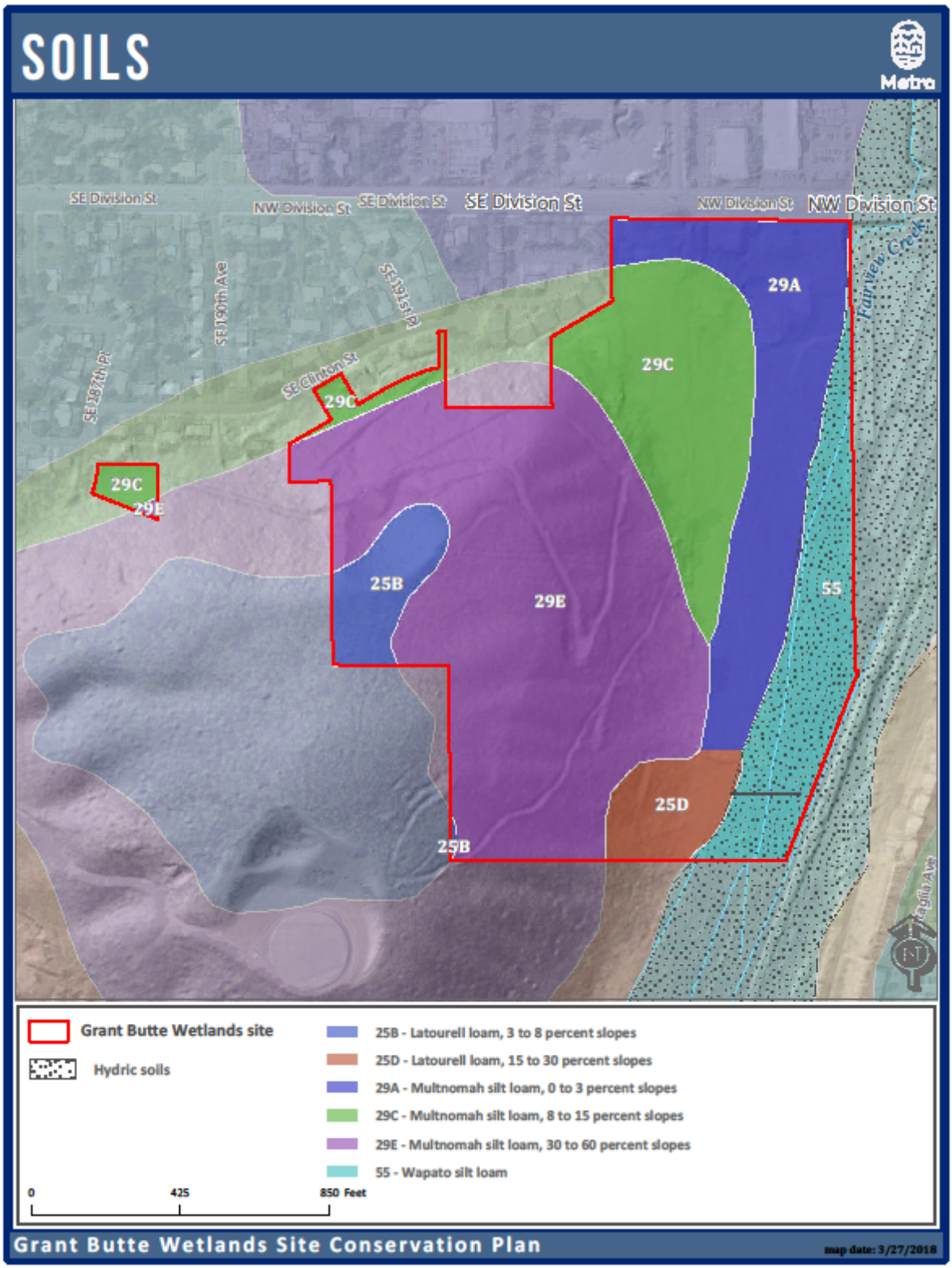
MAP 3

GRANT BUTTE WETLANDS NATURAL AREA TOPOGRAPHY



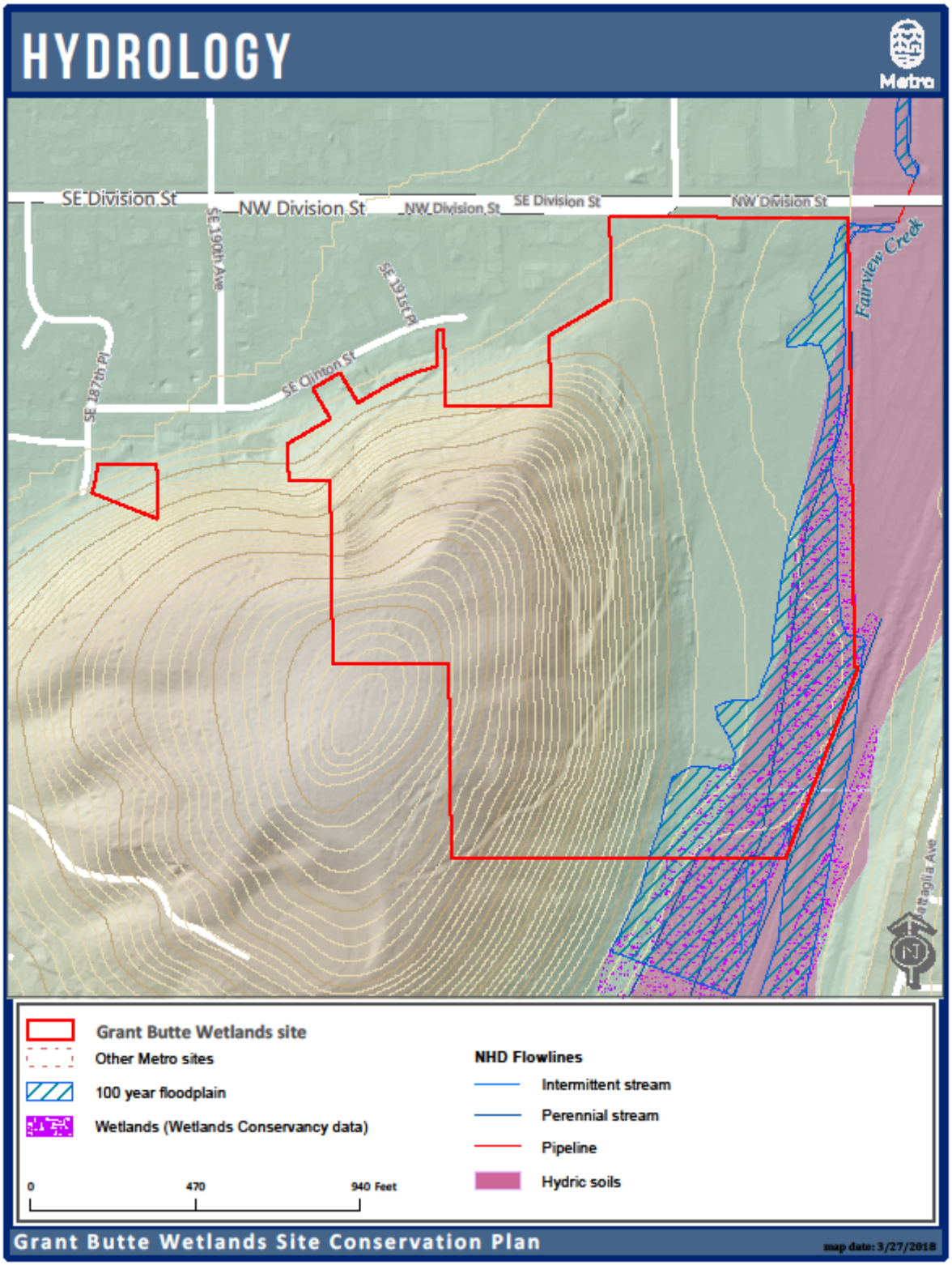
MAP 4

GRANT BUTTE WETLANDS NATURAL AREA SOILS



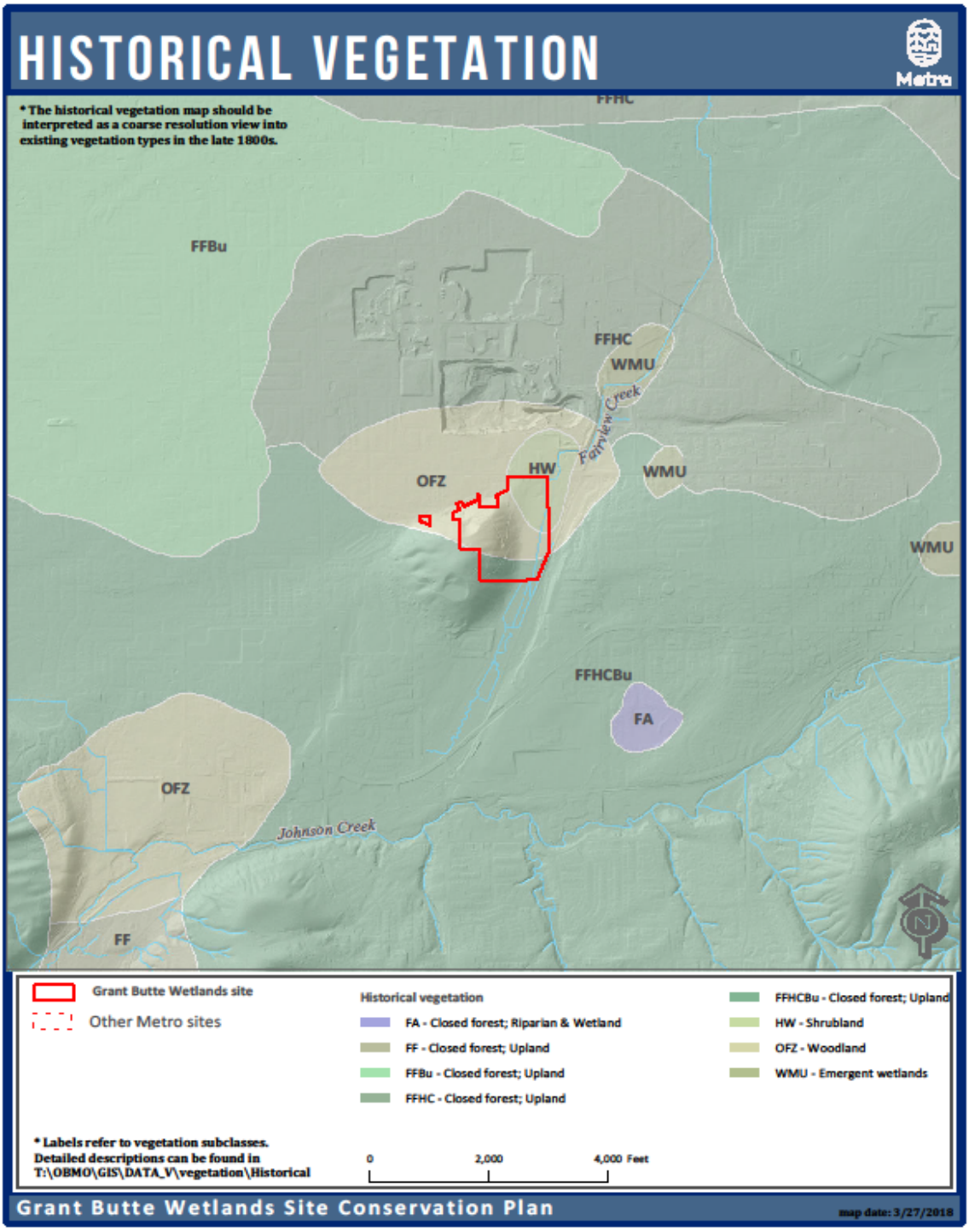
MAP 5

GRANT BUTTE WETLANDS NATURAL AREA HYDROLOGY



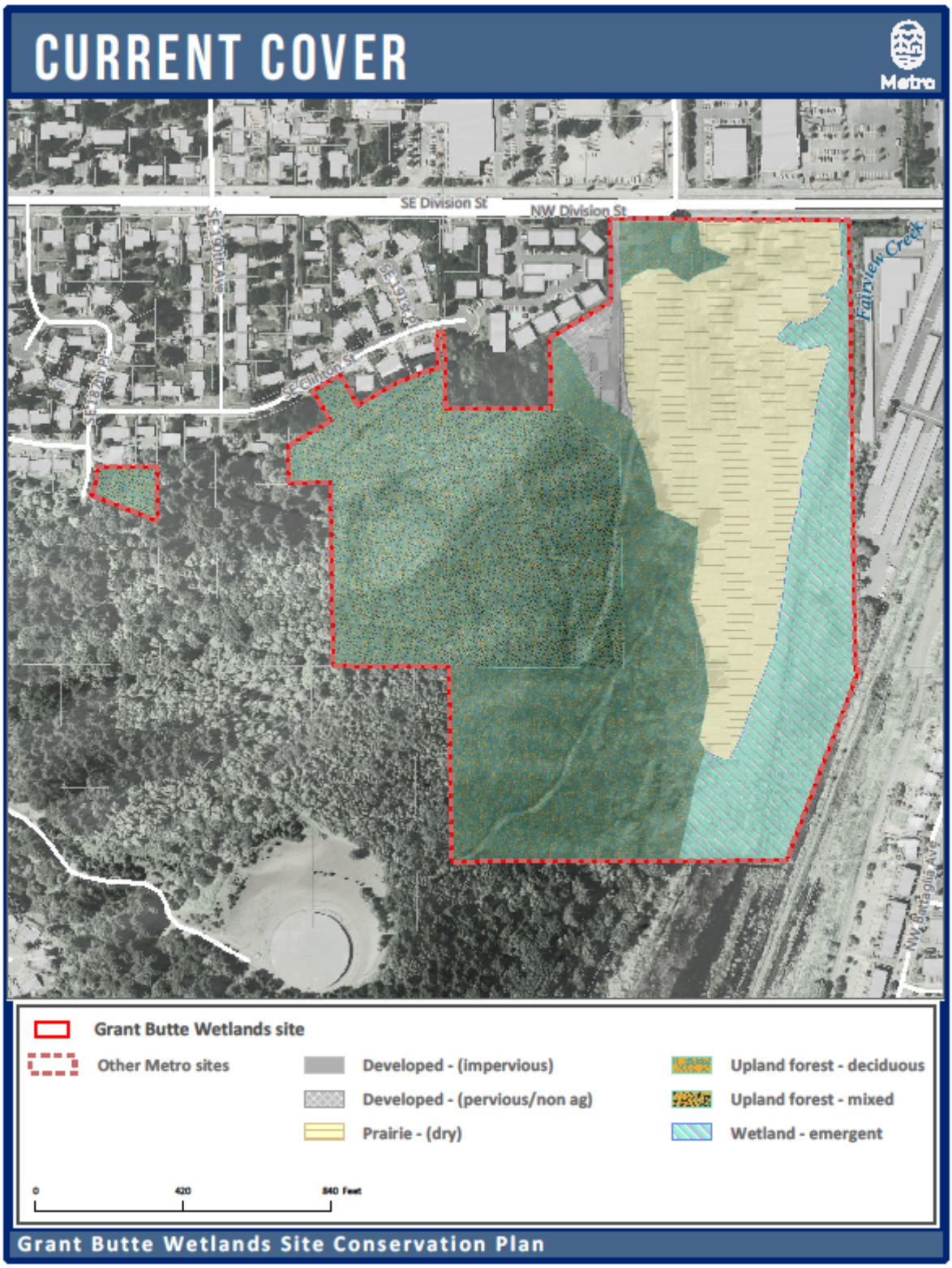
MAP 6

GRANT BUTTE WETLANDS NATURAL AREA HISTORICAL VEGETATION



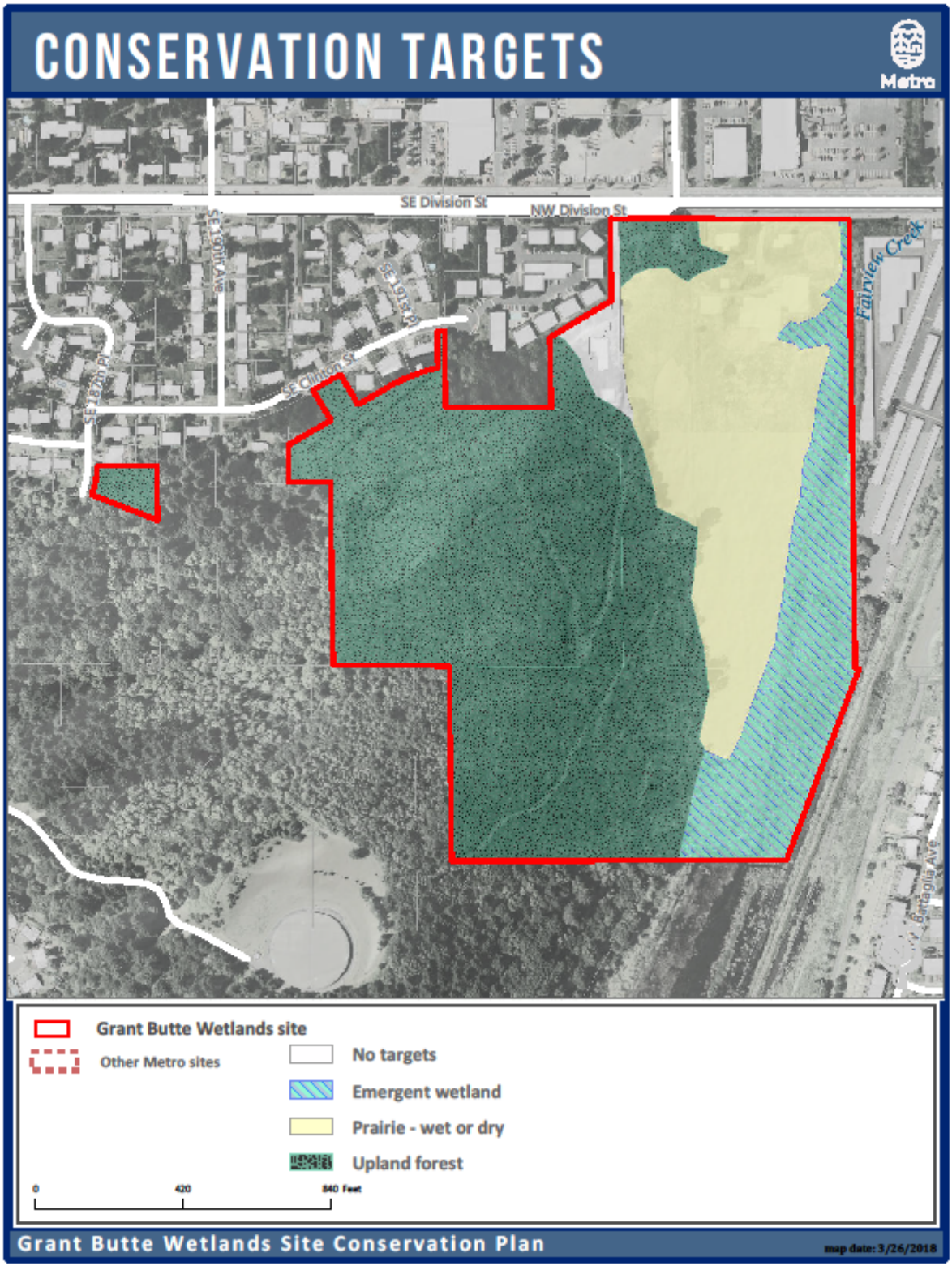
MAP 7

GRANT BUTTE WETLANDS NATURAL AREA CURRENT COVER



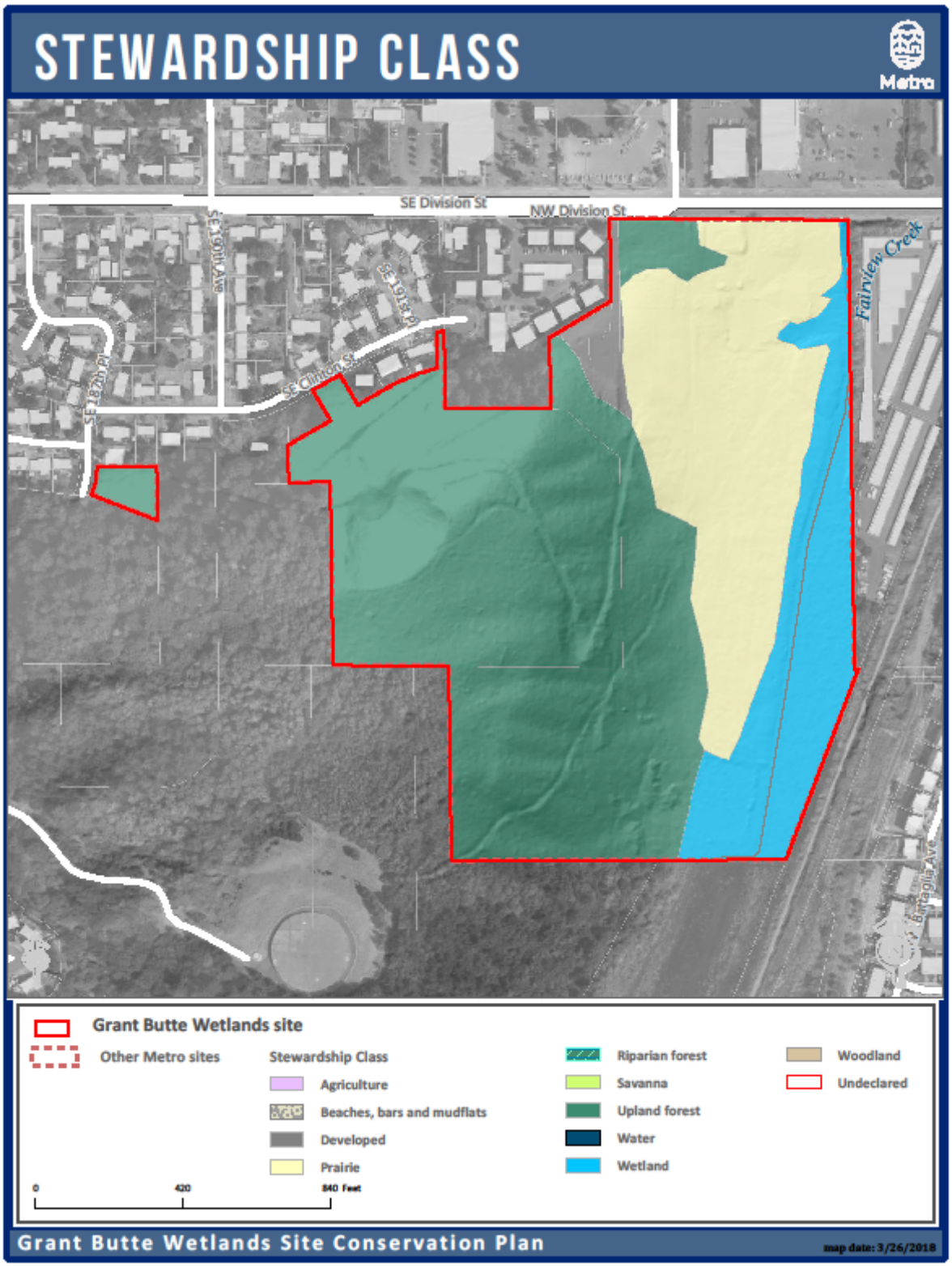
MAP 8

GRANT BUTTE WETLANDS NATURAL AREA CONSERVATION TARGETS



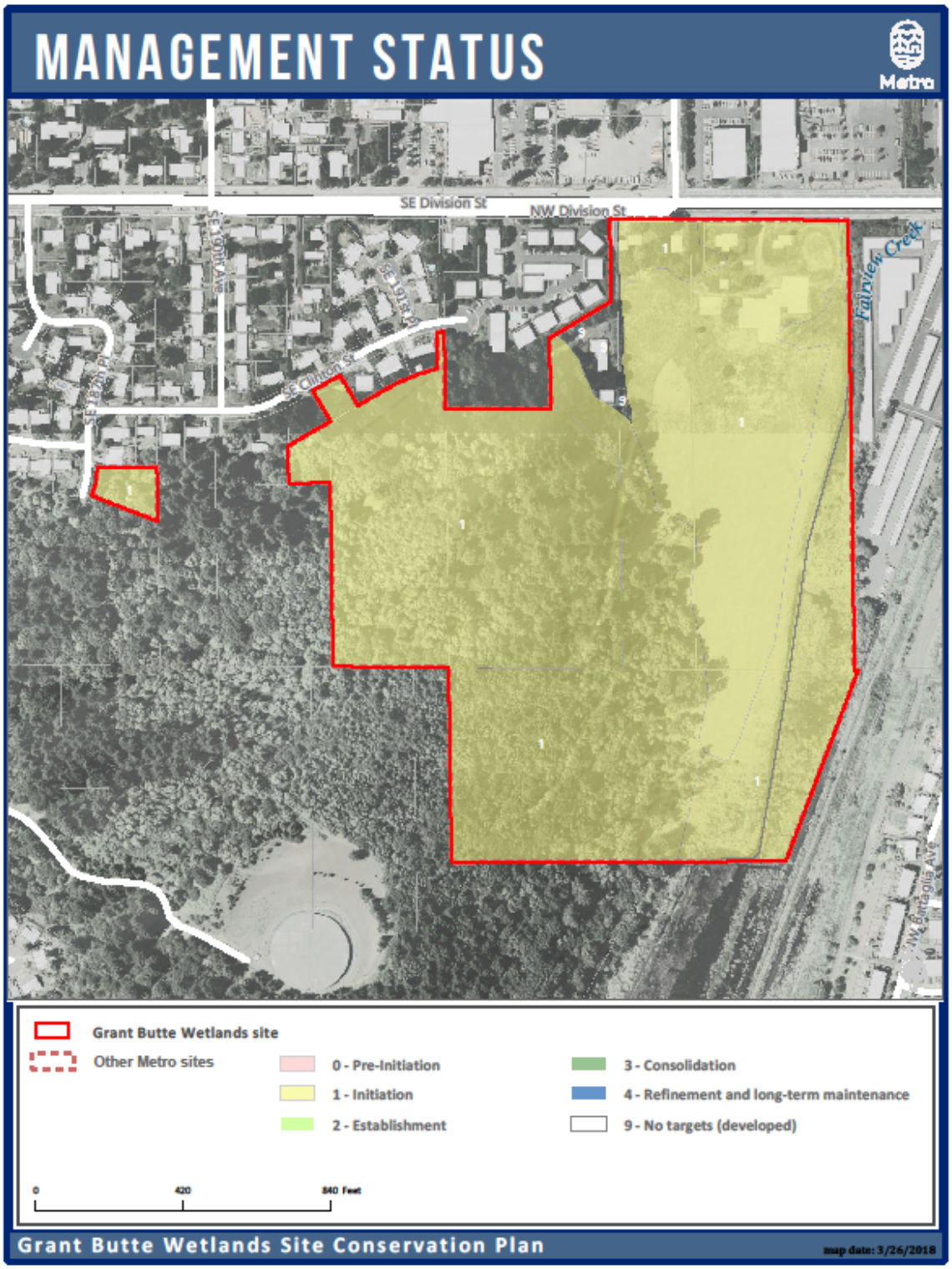
MAP 9

GRANT BUTTE WETLANDS NATURAL AREA STEWARDSHIP CLASS



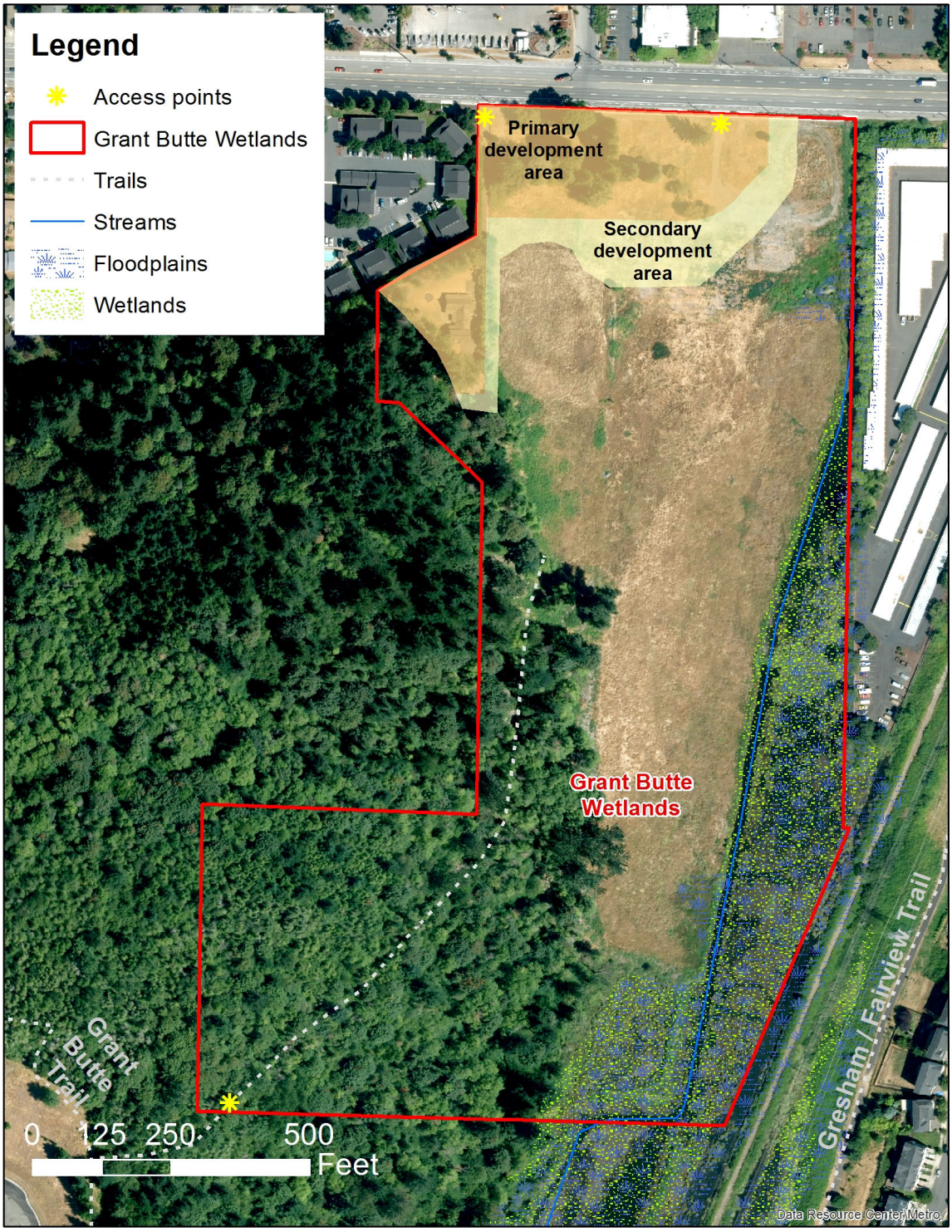
MAP 10

GRANT BUTTE WETLANDS NATURAL AREA MANAGEMENT STATUS



MAP 11

GRANT BUTTE WETLANDS NATURAL AREA ACCESS AND POTENTIAL DEVELOPMENTS



APPENDIX A: HISTORICAL CONTEXT

Little is known about the Multnomah and Clackamas bands of the Chinook Tribe that used the area. It is likely that the members of the Nichaqwli (also known as Nachcokee and Ne-cha-co-lee) village located near Blue Lake frequented the Grant Butte Wetlands, perhaps to fish or harvest wapato. Most of the Chinook Tribes were severely impacted by smallpox and malaria after the first European contact in the 1770s and by subsequent epidemics in the early 1830s. The earliest settlers recorded finding piles of bones near Blue Lake.[5]

Early GLO land survey records and maps from the 1850s show a marsh or wetland in the low areas east of Grant Butte but no creek channel (Map 6). Early GLO land survey records and maps from the 1850s show only a marsh or wetland in the low areas northeast of Grant Butte at the watershed divide. There is no early evidence of a channel draining directly to either Johnson Creek or Fairview Creek. However, it is also possible that a small wetland channel drainage could have been missed by the GLO surveyors.

Grant Butte Wetlands natural area was probably first cleared for agriculture in the mid to late nineteenth century. Henry Gantenbein and his spouse acquired property from Frederick Spratten and his spouse in 1950 and started a dairy farm. Grant Butte was cleared by logging and fire by the early twentieth century and appears bald in 1955 aerial photographs. The open prairie area at Grant Butte Wetlands Natural Area served as pasture land for dairy and beef cattle from 1948 to 2000. From 2000 to 2014 the previous owners pastured horses and rented the homes on the old Gantenbein Dairy property.

Drainage systems established the Fairview Creek channel starting in the 1870s as part the Stanley's Drainage Ditch and Section Line Drainage District systems. The ditch networks dewatered of the large wetland complex at the base of Grant Butte. Long before becoming known as Fairview Creek, the waterway was considered a ditch by the adjacent landowners, until at least 1937.

The land was drained for agriculture and to accommodate local farm roads and eventually early arterial streets. As culverts under roads created concentrated areas of flow, more established channels formed and ditches were constructed and connected to drain wetlands for agriculture. Ditching to the south was established with the construction of Powell Boulevard in the 1930s but outflow is thought to have been more episodic and in association heavy storm events. Surface flow to Johnson Creek probably reduced further or ceased after the re-routing and expansion of Powell Boulevard in the 1960s.[6] Since the mid-1990s the water table in the area appears to be rising.

To the south, surface water connection to Johnson Creek has changed with historic land use and transportation infrastructure. Around 1900 a grist mill along Johnson Creek impounded water that would have backed up in to Grant Butte wetlands during high flows as evidenced by old contour maps. Old maps and country records confirm channel from the wetlands to Johnson Creek in 1943 but due to the topography flow south to Johnson Creek probably remained episodic and in

[5] See Laura Foster Materials & Blue Lake Park History & GLO Survey maps
[6] Laura Foster (lauraobfoster@gmail.com), Grant Butte Wetland Natural area Interviews & Research Notes, 2014.

association with heavy precipitation. In 1965 the construction of Powell Boulevard by Oregon Department of Transportation severed the southern tip of the wetlands. Although it remained hydrologically connect by culverts, subsequent construction of surface streets to the south of Powell Boulevard further reduced flow to Johnson Creek.[7]

Since at least 2001 rising groundwater at the base of Grant Butte has been observed, leading to expanded open water areas and the death of some riparian trees due to root zone saturation. The precise cause of this increase is unknown. Due to topography and porous soils there is very little storm water run-off that drains to the wetlands; only one storm water facility at the corner of SW Sandlewood Loop and SW 2nd St treats run-off draining to the wetlands from adjacent residential neighborhoods. One other outfall to the wetlands provides an emergency overflow outlet for the drinking water reservoir. The previous owners of the Gantenbein Dairy property attribute rising water table to obstruction of out flow caused by upgrades to NW Division St in the 1980s but this has not been confirmed.

[7] Laura Foster (lauraobfoster@gmail.com), Grant Butte Wetland natural area Interviews & Research Notes, 2014; Kathy Majidi, City of Gresham.

APPENDIX B: CONSERVATION IN DETAIL

Appendix B explains how we developed conservation targets and restoration priorities for at Grant Butte Wetlands Natural Area, within the context of other regional conservation planning.

RELATIONSHIP TO OTHER CONSERVATION PLANS

Historically, the Willamette Valley was dominated by extensive prairie, oak savanna and woodland habitats totaling approximately two million acres that supported one of the most diverse and endemic-rich lowland ecosystems in the Pacific Northwest (Floburg et al 2004). These habitats were created and maintained through active fire management by Native Americans. With the arrival and settlement by Euro-Americans, traditional Native American fire and land stewardship practices ceased, and were replaced with EuroAmerican agriculture and development. The result of this wholesale cultural and economic transformation was the loss and degradation of native ecosystems, leaving less than two percent of all historic prairies and seven percent of oak habitat extant today.

Contemporary regional conservation plans for imperiled wildlife, plants and ecosystems include: the Oregon Department of Fish and Wildlife's Oregon Conservation Strategy (ODFW 2006), The Nature Conservancy's Ecoregional Assessment of the Willamette Valley – Puget Trough-Georgia Basin (Floburg et al 2004), the Northwest Power and Conservation Council's Willamette Subbasin Plan (NWPCC 2005), and Partners in Flight's Conservation Strategy for Landbirds in Lowlands and Valleys of Western Oregon and Washington (Altman 2000). These plans identify both focal habitats and focal species as conservation targets.

In spite of its relatively small size and isolation by urban development, Grant Butte Wetlands natural area is connected to adjacent natural areas, harbors diverse habitats and unique species, and has excellent opportunities for conservation education and natural history interpretation. The site includes open prairie habitat (which is relatively rare in Gresham), approximately 1800 linear feet of Fairview Creek and associated wetlands, and safeguards a local native turtle population. The site's upland forest connects with adjacent forested tracts owned and managed by the City of Gresham and Rockwood PUD. These three habitats (upland forest, prairie, and emergent wetland) and native turtles were selected as conservation targets for Grant Butte Wetlands Natural Area.

Conservation targets are composed of a suite of species, communities and ecological systems that represent and encompass the full array of native biodiversity of the site; reflect local and regional conservation goals; and be viable or at least feasibly restorable (The Nature Conservancy 2007). Priority conservation targets represent species or habitats that are the conservation focus for a given area or management unit. Conservation targets establish the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness. They are the foundation of conservation planning. Key ecological attributes (KEAs) for each conservation target were evaluated.

KEY ECOLOGICAL ATTRIBUTES

Key ecological attributes (KEAs) represent important aspects of a conservation targets biology or ecology that, if missing or degraded, would lead to the loss of that target over time (Nature Conservancy 2007). KEAs define the conservation target's viability at a site, and describe progress towards the specific restoration goals that are appropriate for a site. For each conservation target, one or more KEA indicators were selected to assess their current ecological condition and define goals for the duration of the site conservation plan.

Indicators are measurable entities related to the condition of the conservation target (Nature Conservancy 2007). A good indicator should be: biologically relevant, sensitive to anthropogenic stress, measurable, cost-effective, anticipatory, and socially relevant. KEA indicators are categorized by type: size, condition, and landscape context.

The status of an indicator will vary over time but can be broadly described as very good, good, fair, or poor. The very good and good ratings mean an indicator is functioning within its acceptable ecological range of variation. The fair and poor ratings mean that an indicator lies outside its range of acceptable variation and may require human intervention or risk habitat degradation and/or species extirpation from the site.

At an urban natural area like Grant Butte Wetlands Natural Area, Metro acknowledges that it may not be possible for certain ecological indicators to achieve very good or even good condition due to the diverse array of human population, ongoing or legacy development stressors, and landscape-level habitat fragmentation and isolation.

KEAs and their indicators for Grant Butte Wetlands are presented in the following Tables 4a-4d.

Table 4a. Key ecological attributes for Upland Forest.

CATEGORY	KEA	INDICATOR	---------- INDICATOR RATING ----------				CURRENT RATING	DFC* FOR THIS SCP	LONG TERM DFC	COMMENTS
			POOR	FAIR	GOOD	VERY GOOD				
Condition	Vegetative structure: native tree and shrub layer	% native tree and shrub canopy cover (combined)	<25% cover	25-50% cover	50-75% cover	>75% cover	Fair	Good	Very Good	Tree cover is still dominated by natives. Understory has invasives but also a diverse mix of native shrub and ground layer plants that can be restored by Metro and partner stewards.
Condition	Standing and downed dead trees	Average # of snags and large wood (>50 cm, or 20 in, DBH) per acre	< 5 snags and <5% down wood	5-11 snags and 5-10% down wood	12-18 snags and 10-20% down wood with moderate variety of size and age classes	>18 snags and >20% cover down wood in a good variety of size and age classes	Poor	Fair	Fair	Very few snags remain and there is little down wood. With girdling and removal of nonnative trees, this could be boosted through near-term actions but will require long-term stewardship to measurably improve snag and down wood levels.

Table 4b. Key ecological attributes for Emergent Wetlands.

CATEGORY	KEA	INDICATOR	---------- INDICATOR RATING ----------				CURRENT RATING	DFC* FOR THIS SCP	LONG TERM DFC	COMMENTS
			POOR	FAIR	GOOD	VERY GOOD				
Condition	Buffer condition**	Condition within 50 m (164 ft) of emergent wetland perimeter	>50% cover of non-native plants, barren ground, highly compacted or otherwise disrupted soils	25–50% cover of non-native plants, moderate or extensive soil disruption	75–95% cover of native vegetation, low (5–25%) cover of non-native plants, intact or moderately disrupted soils	>95% cover native vegetation	Poor	Fair	Fair	Vegetation in wetland and on west shore is dominated by reed canarygrass. To the east, bordering the commercial storage property and abandoned road, Himalayan blackberry, English ivy, and other nonnative plants dominate, with a sparse overstory of red alder, black locust, and other ornamental trees. With active stewardship, this vegetation cover could be shifted towards more native shrub species cover.

Table 4c. Key ecological attributes for Native Turtles.

CATEGORY	KEA	INDICATOR	---------- INDICATOR RATING ----------				CURRENT RATING	DFC* FOR THIS SCP	LONG TERM DFC	COMMENTS
			POOR	FAIR	GOOD	VERY GOOD				
Condition	Nest habitat distribution	Distribution of suitable nesting areas within 150 feet of water	Suitable nesting areas lacking	Suitable nesting areas limited to 1-2 locations	Suitable nesting areas limited to 3-4 locations	≥5 suitable nesting areas distributed around site	Poor	Fair	Good	Suitable nest sites are available, but additional active management to maintain nesting and improve habitat and prevent vegetation encroachment is needed. Enhanced nesting habitat is expected to improve prospects for juvenile survival at the site.
Condition	Basking site availability	Number of basking sites	Suitable basking sites lacking	Few basking sites available	Sufficient basking sites available	Ample basking sites available at each location where >20 turtles known to occur	Poor	Good	Good	There are a few logs or other basking sites in/around the wetland edge, and a general lack of mature overhanging trees that could recruit to the wetland and form new basking logs. Active improvement of basking sites is needed.

Table 4d. Key ecological attributes for Prairie.

CATEGORY	KEA	INDICATOR	---------- INDICATOR RATING ----------				CURRENT RATING	DFC* FOR THIS SCP	LONG TERM DFC	COMMENTS
			POOR	FAIR	GOOD	VERY GOOD				
Condition	Native forb and grass abundance	Percent cover native forb and grasses	<20%	20-30%	30-50%	>50%	Poor	Fair	Fair	Prairie is an abandoned pasture with few native species. Management would focus on removal of weeds and replacement with patches of native forbs and grasses, expanding over time.

THREATS AND SOURCES

A stress is the "impairment or degradation of the size, condition, and landscape context of a conservation target, and results in reduced viability of the target" (The Nature Conservancy 2007). Stresses may reduce the viability of priority fish, wildlife, and plant species at a site or lead to the degradation of a priority habitat. A source of stress is an extraneous factor, either human (e.g., policies, land use) or biological (e.g., non-native species) that infringes upon a habitat or species target in a way that results in stress. Together, stresses and their sources, constitute a threat.

Metro follows the Nature Conservancy's methods to identify threats at a site, analyze and categorize these threats, and then use this analysis to determine realistic and achievable restoration and enhancement goals for individual conservation targets. An effective conservation strategy requires a thorough understanding of threats and their sources, as a means to prioritize viable conservation actions.

To complete a threats analysis at Grant Butte Wetlands, we:

- Identified and scored stresses for each conservation target.
- Identified and scored the sources of stress.
- Used the combination of stress and source ranks to assign an overall threat risk.

Threats for each conservation target were identified and ranked as low, medium, or high. The most severe threats are those that are likely to seriously degrade or destroy a large portion of a habitat within the next 10 years, and that can reasonably be addressed. Threats that we have no control over receive low ratings. This method helps identify restoration and stewardship activities that can abate the more severe threats. See below for more information on the threats identification and ranking methodology.

Threat rankings are expected to change over time, for example if invasive species become a much more severe problem in a given conservation target. Threats and source analysis for Grant Butte Wetlands are listed in Tables 5a-d, below.

Table 5a. Threats to Upland Forest at Grant Butte Wetlands Natural area.

STRESS	STRESS RANK	SOURCE OF STRESS	SOURCE RANK	THREAT RANK	COMMENTS
Habitat destruction and altered composition from past management practices	High	Previous forest management, skid road construction	Medium	Medium	Loss of large trees, snags, and downed wood
Increased competition and altered ecosystem structure/functions from invasive species	High	Extensive invasive shrub and ground layer species, limiting recruitment of natives	Medium	Medium	Invasive blackberry, ivy, holly, Herb Robert, Traveler's joy
Human disturbance from ongoing uses, including unauthorized uses	High	Trail use, pets, houseless camps	Medium	Medium	Vegetation trampling, spreading invasive weeds, disturbance to ground-dwelling wildlife.

Table 5b. Threats to Emergent Wetlands at Grant Butte Wetlands Natural area.

STRESS	STRESS RANK	SOURCE OF STRESS	SOURCE RANK	THREAT RANK	COMMENTS
Altered habitat structure, composition, and processes	High	From farm and adjacent urban development	Medium	Medium	Historical management with ongoing, legacy impacts
Increased competition and altered ecosystem structure/functions from invasive species	High	Established monotypic stands of reed canarygrass, limiting recruitment of native species	Medium	Medium	Historical management with ongoing, legacy impacts
Altered hydrology [from filling, ditching, and modification of outflows]	Medium	Ditching and filling of wetland, on- and off-property	High	Medium	A channel was dredged through wetland, fill placed along W and E banks, eliminating areas with shallow water and seasonal inundation
Human disturbance from ongoing uses, including unauthorized uses	Medium	Trail use, pets, houseless camping	Medium	Low	Human use of closed roadbed and Gresham-Fairview trail impacts wildlife in wetland, impacts to water quality

Table 5c. Threats to Native Turtle habitat at Grant Butte Wetlands Natural area.

STRESS	STRESS RANK	SOURCE OF STRESS	SOURCE RANK	THREAT RANK	COMMENTS
Limited or disconnected upland nesting areas	Low	From past farming practices in pasture, and on adjacent urban lands	Low	Not a threat	
Vegetation encroachment and reduction of solar insolation	High	On nesting sites, reducing juvenile survival and recruitment	Medium	Medium	Lack of periodic vegetation disturbance prevents adequate solar insolation required for successful nesting.
Loss/destruction of basking habitat	High	Through loss of riparian cover and treefall, as well as clean outs of large logs from stream & wetlands	Medium	Medium	Basking log recruitment is limited by degraded riparian vegetation fringing wetland.
Human disturbance from ongoing uses, including unauthorized uses	Medium	Trails use, pets, houseless camping	Medium	Low	Likely concentrated in former pasture area and along upland forest road.

Table 5d. Threats to Prairie at Grant Butte Wetlands Natural area.

STRESS	STRESS RANK	SOURCE OF STRESS	SOURCE RANK	THREAT RANK	COMMENTS
Habitat destruction and altered composition from past management practices	High	Through conversion to pastureland and loss of historical fire and hydrological regimes	High	High	Native prairie restoration will require additional commitment of resources, due to high concentration of weeds and human disturbance.
Increased competition and altered ecosystem structure/functions from invasive species	High	Non-native pasture grasses crowding out native grass and forb species	High	High	Ongoing management needed to control most egregious invasive vegetation.
Human disturbance from ongoing uses, including unauthorized uses	Medium	Associated with past farming, as well as ongoing informal recreational uses and houseless camping	Medium	Low	Planning is needed to concentrate new and ongoing human uses at north end of prairie, to preserve restoration options at south end of property.

Background on methods for the identification and ranking of threats

We identified potential threats as any alteration of a KEA that can result or has resulted in a KEA declining below a "good" rating. For each conservation target, KEA indicators with ratings of "poor" or "fair" were analyzed by asking the question "What types of destruction, degradation or impairment are responsible for the 'poor' or 'fair' rating?" We also considered those KEA indicators with "good" and "very good" ratings but are likely to degrade to "poor" or "fair" if no management actions are taken.

Stresses were ranked according to two criteria, severity and scope of the anticipated damage, where:

Severity is the level of damage to the conservation target that can reasonably be expected within 10 years under current circumstances.

- **Very high:** The threat is likely to destroy or eliminate the conservation target over some portion of the target's occurrence at the site.
- **High:** The threat is likely to seriously degrade the conservation target over some portion of the target's occurrence at the site.
- **Medium:** The threat is likely to moderately degrade the conservation target over some portion of the target's occurrence at the site.
- **Low:** The threat is likely to only slightly impair the conservation target over some portion of the target's occurrence at the site.

Scope is the geographic extent of impact on the conservation target at the site that can reasonably be expected within 10 years under current circumstances.

- **Very high:** The threat is likely to be widespread or pervasive in its scope and affect the conservation target throughout the target's occurrences at the site.
- **High:** The threat is likely to be widespread in its scope and affect the conservation target at many of its locations at the site.
- **Medium:** The threat is likely to be localized in its scope and affect the conservation target at some of the target's locations at the site.
- **Low:** The threat is likely to be very localized in its scope and affect the conservation target at a limited portion of the target's location at the site.

Once the severity and scope ratings are determined, they are combined to develop a stress ranking using the following stress ranking table (The Nature Conservancy 2007).

Table 6: Stress ranking

	SCOPE			
SEVERITY	**VERY HIGH**	**HIGH**	**MEDIUM**	**LOW**
VERY HIGH	Very high	High	Medium	Low
HIGH	High	High	Medium	Low
MEDIUM	Medium	Medium	Medium	Low
LOW	Low	Low	Low	Low

Identify sources of stress and apply threat to system rank

Sources of stresses are the proximate cause of the stress. A source of stress may be either human activities or biological (e.g., non-native species). Sources of the stress are rated in terms of **contribution** and **irreversibility** as defined below (The Nature Conservancy 2007):

Contribution: The expected contribution of the source, acting alone, under current circumstances (i.e., given the continuation of the existing management/conservation situation).

- **Very high:** The source is a very large contributor of the particular stress.
- **High:** The source is a large contributor of the particular stress.
- **Medium:** The source is a moderate contributor of the particular stress.
- **Low:** The source is a low contributor of the particular stress.

Irreversibility: The degree to which the effects of a source of stress can be restored.

- **Very high:** The source produces a stress that is irreversible (e.g., wetlands converted to a shopping center).
- **High:** The source produces a stress that is reversible, but not practically affordable (e.g., wetland converted to agriculture).
- **Medium:** The source produces a stress that is reversible with a reasonable commitment of resources (e.g., ditching and draining of wetland).
- **Low:** The source produces a stress that is easily reversible at relatively low cost (e.g., off-road vehicles trespassing in wetland).

The contribution and irreversibility of each source across all the stresses to each conservation target is ranked using Table 5, resulting in a source of stress rank for each contribution/ irreversibility combination (The Nature Conservancy 2007).

Table 7: Source ranking

	CONTRIBUTION			
IRREVERSIBILITY	**VERY HIGH**	**HIGH**	**MEDIUM**	**LOW**
VERY HIGH	Very high	High	High	Medium
HIGH	Very high	High	Medium	Medium
MEDIUM	High	Medium	Medium	Low
LOW	High	Medium	Low	Low

In a similar fashion stress and source rankings are combined to develop a threat ranking specific to that conservation target (Table 6).

Table 8: Threat ranking

	---------- CONTRIBUTION ----------			
STRESS	**VERY HIGH**	**HIGH**	**MEDIUM**	**LOW**
VERY HIGH	Very high	Very high	High	Medium
HIGH	High	High	Medium	Low
MEDIUM	Medium	Medium	Low	Low
LOW	Low	Low	Low	Low

APPENDIX C: SPECIES LISTS

APPENDIX C.1 GRANT BUTTE WETLANDS VERTEBRATES

This list includes vertebrate species sighted or otherwise known to inhabit the vicinity of Grant Butte Wetlands Natural Area. It is not a complete list, but rather a working list of vertebrate fauna, or their sign, observed in the area.

Common Name	Genus species
Western Brook Lamprey	*Lampetra richardsoni*
Northwestern Salamander	*Ambystoma gracile*
Rough-skinned Newt	*Taricha granulosa*
Pacific Chorus Frog (tree frog)	*Hyla regilla*
Northern Red-legged Frog	*Rana aurora aurora*
American Bullfrog*	*Rana catesbeiana*
Painted Turtle	*Chrysemys picta*
Western Terrestrial Garter	*Thamnophis elegans*
Northwestern Garter Snake	*Thamnophis ordinoides*
Common Garter Snake	*Thamnophis sirtalis*
American Bittern	*Botaurus lentiginosus*
Great Blue Heron	*Ardea herodias*
Black-crowned Night Heron	*Nycticorax nycticorax*
Great Egert	*Ardea alba*
Turkey Vulture	*Cathartes aura*
Canada Goose	*Branta canadensis*
Wood Duck	*Aix sponsa*
Gadwall	*Anas strepera*
Mallard	*Anas platyrhynchos*
American Wigeon	*Anas americana*
Cinnamon Teal	*Anas cyanoptera*
Ring-necked Duck	*Aythya collaris*
Lesser Scaup	*Aythya affinis*
Bufflehead	*Bucephala albeola*
Hooded Merganser	*Lophodytes cucullatus*
Common Merganser	*Mergus merganser*
Red-breasted Merganser	*Mergus serrator*
Osprey	*Pandion haliaetus*
Cooper's Hawk	*Accipiter cooperii*
Red-tailed Hawk	*Buteo jamaicensis*
American Kestrel	*Falco sparverius*
California Quail	*Callipepla californica*
Virginia Rail	*Rallus limicola*
American Coot	*Fulica americana*
Killdeer	*Charadrius vociferus*
California Gull	*Larus californicus*
Rock Dove*	*Columba livia*
Mourning Dove	*Zenaida macroura*
Unidentified owl	*?*
Vaux's Swift	*Chaetura vauxi*
Anna's Hummingbird	*Calypte anna*
Rufous Hummingbird	*Selasphorus rufus*
Belted Kingfisher	*Ceryle alcyon*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Downy Woodpecker	*Picoides pubescens*
Hairy Woodpecker	*Picoides villosus*
Northern Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
Western Wood-Pewee	*Contopus sordidulus*
Willow Flycatcher	*Empidonax traillii*
Pacific-slope Flycatcher	*Empidonax dificilus*
Warbling Vireo	*Vireo gilvus*

Common Name	Genus species
Steller's Jay	*Cyanocitta stelleri*
Western Scrub-Jay	*Aphelocoma californica*
American Crow	*Corvus brachyrhynchos*
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
Northern Rough-winged	*Stelgidopteryx serripennis*
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapilla*
Chestnut-backed Chickadee	*Poecile rufescens*
Bushtit	*Psaltriparus minimus*
Red-breasted Nuthatch	*Sitta canadensis*
Brown Creeper	*Certhia americana*
Bewick's Wren	*Thryomanes bewickii*
Pacific Wren	*Troglodytes pacificus*
Ruby-crowned Kinglet	*Regulus calendula*
Swainson's Thrush	*Catharus ustulatus*
American Robin	*Turdus migratorius*
Varied Thrush	*Ixoreus naevius*
European Starling*	*Sturnus vulgaris*
Cedar Waxwing	*Bombycilla cedrorum*
Orange-crowned Warbler	*Vermivora celata*
Yellow Warbler	*Dendroica petechia*
Yellow-rumped Warbler	*Dendroica coronata*
Townsend's Warbler	*Dendroica townsendi*
Common Yellowthroat	*Geothlypis trichas*
Wilson's Warbler	*Wilsonia pusilla*
Western Tanager	*Piranga ludoviciana*
Spotted Towhee	*Pipilo maculatus*
Song Sparrow	*Melospiza melodia*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Dark-eyed Junco	*Junco hyemalis*
Black-headed Grosbeak	*Pheucticus*
Red-winged Blackbird	*Agelaius phoeniceus*
House Finch	*Carpodacus mexicanus*
Pine Siskin	*Carduelis pinus*
Lesser Goldfinch	*Carduelis psaltria*
American Goldfinch	*Carduelis tristis*
House Sparrow*	*Passer domesticus*
Virginia Opossum*	*Didelphis virginiana*
Brush Rabbit	*Sylvilagus bachmani*
Eastern Fox Squirrel*	*Sciurus niger*
Eastern Gray Squirrel*	*Sciurus carolinensis*
Northern Flying Squirrel	*Glaucomys sabrinus*
American Beaver	*Castor canadensis*
Nutria*	*Myocastor coypus*
Coyote	*Canis latrans*
Common Raccoon	*Procyon lotor*
Northern River Otter	*Lontra canadensis*
Domestic Cat (feral)*	*Felis domesticus*
Mule Deer	*Odocoileus hemionus*

APPENDIX C.2 GRANT BUTTE WETLANDS PLANTS

This list includes known observed plant species at Grant Butte Wetlands natural area. It is not a complete list, but rather a working list of plants observed in the area.

Common Name	***Genus species***
Ponderosa Pine	*Pinus ponderosa,*
Douglas Fir	*Pseudotsuga menziesii*
Grand Fir	*Abies grandis*
Red Alder	*Alnus rubra*
Black Cottonwood	*Populus trichocarpa*
Oregon Ash	*Fraxinus latifolia*
Bigleaf Maple	*Acer macrophyllum*
Beaked Hazelnut	*Corylus cornuta*
unknown birch	*Betula*
Sweet cherry	*Prunus avium*
Indian Plum	*Oemleria cerasiformis*
Vine Maple	*Acer circinatum*
English Holly	*Ilex aquifolium*
Red Elderberry	*Sambucus racemosa*
Cascara	*Rhamnus purshiana*
Snowberry	*Symphoricarpos albus*
Ocean Spary	*Holodiscus discolor*
Oregon Grape	*Mahonia aquifolium*
Western Sword Fern	*Polystichum munitum*
Trailing blackberry	*Rubus ursinus*
Thimbleberry	*Rubus parviflorus*
Fringecup	*Tellima grandiflora*
Stinging Nettle	*Urtica dioica*
Enchanters Nightshade	*Circaea lutetiana*
Poison Oak	*Toxicodendron diversilobum*
Himalayan Blackberry	*Rubus armeniacus*
English Ivy	*Hedera helix*
English Hawthorne	*Crataegus monogyna*
Herb Robert	*Robertiella robertiana*
Traveler's Joy (Virgins Bower)	*Clematis vitalba*
Sequoia Redwood	*Sequoiadendron giganteum*
Deodar Cedar	*Cedrus deodara*
Atlas or Lebanon Cedar	*Cedrus atlantica or libani*
Monkey Puzzle	*Araucaria araucana*
Bunya Pine	*Araucaria bidwillii*
unknown apple	*Malus*
Unknown Oak (Red or Scarlet)	*Quercus*
Winged Elm	*Ulmus alata*
Reed Canarygrass	*Phalaris arundinacea*
Tall Fescue	*Schenodorus arundinaceus*
Red Fescue	*Festuca rubra*
Meadow foxtail	*Alopecurus pratensis*
Orchard grass	*Dactylus glomerata*
Bentgrasses	*Agrostis spp.*
Common teasel	*Dipsacus fullonum*
Yellow toadflax	Linaria vulgaris
Tansy ragwort	*Jacobea vulgaris*
Birds-foot trefoil	*Lotus corniculatus*
Creeping buttercup	*Ranunculus repens*

Common Name	***Genus species***
Soft Rush	*Juncus effusus*
Nodding beggars'-tick	*Bidens cernua*
Dotted smartweed	*Persicaria punctata or Polygonum punctatum*
Red Osier Dogwood	*Cronus alba*
Unknown dogwood	*Cornus*
Unknown willows	*Salix*
Nootka Rose	*Rosa nutkana*
Tall mannagrass	*Glyceria elata*
Spurge Laurel	*Daphne laureola,*
Subarctic lady fern	*cyclosorum*
Dewey's sedge	*Carex lepotopoda*
Young-on-age	*Tolmiea menziesii*
American speedwell	*Veronica americana*
White clover	*Trifolium repens*
Queen Anne's lace	*Daucus carota*
March cuddleweed	*Gnaphalium palustre*
Canadian thistle	*Cirsium arvense*
Brome grass	*Bromus spp.*
Creeping bentgrass	*Agrostis stolonifera*
Broadleaf Plantain	*Plantago major*
Fringed willow herb	*Epilobium ciliatum*
Robert Geranium	*Geranium robertianum*
Hairy cat's ear	*Hypochaeris radicata*
Slender Wheatgrass	*Elymus trachycaulus*
Stinking willie	*Senecio jacobaea*
Common marsh bedstraw	*Galium palustre*
Lesser hawkbit	*Leontodon saxatilis*
Dovefoot geranium	*Geranium molle*
California Brome	*Bromus carinatus*
Narrowleaf plantain	*Plantago lanceolata*
Common sheep sorel	*Rumex acetosella*
Curly dock	*Rumex crispus*
Awlfruit sedge	*Carex stipata*
Perennial ryegrass	*Lolium perenne*
Kentucky bluegrass	*Poa pratensis*
Rough bluegrass	*Poa trivialis*
Largeleaf avens	*Geum macrophyllum*

APPENDIX D: REFERENCES AND OTHER RESOURCES

Christy, J.A., E.R. Alverson, M.P. Dougherty, S.C. Kolar, C.W. Alton, S.M. Hawes, L. Ashkenas, and P. Minear. 2011. GLO historical vegetation of the Willamette Valley, Oregon, 1851-1910. ArcMap shapefile, version 2011_04. Oregon Biodiversity Information Center, Portland State University. http://www.pdx.edu/sites/www.pdx.edu.pnwlamp/files/glo_willamette_2011_04.zip

Green, G.L. 1983. Soil survey of Multnomah County, Oregon. U.S. Department of Agriculture, Soil Conservation Service, Oregon Agricultural Experiment Station. 146 pages.

Small, F. and T. Farrelly. 2015. Wetland delineation for the Grant Butte Wetlands parcel in Gresham, Oregon. Pacific Habitat Services, Wilsonville, OR.

The Nature Conservancy. 2007. Conservation action planning handbook. Arlington, Virginia.