Third Monitoring Report for the North Portland Road Mitigation Site in Portland, Oregon

City of Portland: LU 03-100430 EN EF

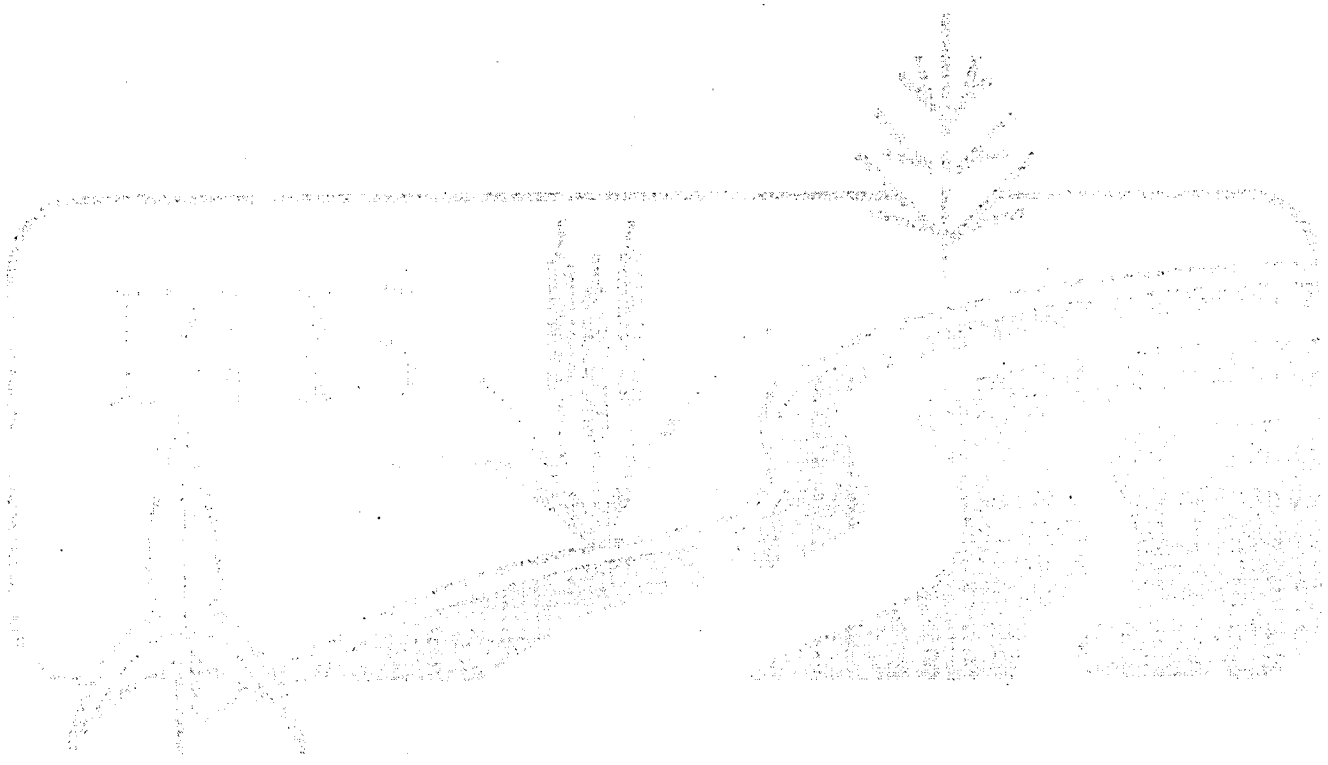
Prepared for

Metro Regional Environmental Management
Portland, Oregon

Prepared by

Pacific Habitat Services, Inc.
Wilsonville, Oregon
(503) 570-0800

December 1, 2006



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Prepared for

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1.0 INTRODUCTION

This report documents the third of three annual monitoring periods for a City of Portland Land Use Review requiring compensatory mitigation for fill in the Columbia Slough floodplain in Portland, Oregon (Figure 1). All Figures are in Appendix A. The off-site mitigation is located off North Portland Road, east of the Columbia Slough and south of Smith Lake in tax lot 900 (Figure 2). The mitigation site was excavated and planted to compensate for fill placed by Metro within the base flood area at the St. Johns Landfill.

The City's Bureau of Development Services issued permit LU 03-100430 EN EF to Metro for the site excavation and restoration. The City requires site monitoring for a minimum of three years during the late summer.

2.0 MITIGATION OBJECTIVES AND CHRONOLOGY

2.1 Mitigation Objectives

The primary function of this mitigation was to restore floodplain area and volume lost at St. Johns Landfill. Initially it was proposed to excavate within three tax lots (tax lot 500, 600 and 900), however excavation was not approved in tax lots 500 and 600. The volume of excavation within tax lot 900 below the 100-year flood elevation was calculated to meet the necessary lost volume and the existing dredge spoils were excavated down to the native soil.

The base elevation of excavation within the dredge spoils on-site was ultimately determined by the phreatic surface elevation in order to insure wetland hydrology within the depression. The lower portion of the site was planted with wetland shrubs and emergents. The sides of the depression were planted with more drought-tolerant shrubs and trees. The woody species were intended to form a structurally diverse buffer around the central wetland. In addition, some larger cottonwood saplings were installed to replace trees removed by the excavation.

2.2 Permit Requirements

The Land Use Review Permit Requirements include:

1. 100% survival of trees and shrubs at the end of each growing season for a period of three years
2. 80% or greater area cover of all mitigation planted areas with native shrub and groundcover species at the end of each growing season
3. Less than 10% area coverage with invasive species of all areas within 10 feet of mitigation plantings at the end of each growing season
4. Marking of each installed plant species with an identifier
5. Establishing fixed photodocumentation points and photographing the site from several points around the periphery
6. Preparing and submitting an annual monitoring report for each year (2004, 2005, 2006)

3.0 VEGETATION

3.1 Woody Plantings and Percent Survival

Native trees and shrubs were planted in early spring 2004 and a remedial planting was conducted in 2005 (which will be discussed in section 3.3). The trees and shrubs installed are shown in Table 1 and 2 respectively. The planting plan is shown in Figure 3. All of the original woody plants were installed in tax lot 900 for the first year.

Table 1. Trees installed at the North Portland Road Mitigation Site, 2006 Counts and Percent Survival.

Scientific Name	Common Name	Originally Installed	Counted 9/27/06	% Survival
Acer macrophyllum	bigleaf maple	18	11	61%
Alnus rubra	red alder	92	0	0%
Crataegus douglasii	black hawthorn	98	93	95%
Fraxinus latifolia	Oregon ash	169	93	55%
*Populus trichocarpa**	black cottonwood	100	200++	200%++
Pseudotsuga menziesii	Douglas-fir	38	97	255%
Malus fusca	western crabapple	36	2	6%
Rhamnus purshiana	cascara buckthorn	103	35	34%
*Salix spp.***	willow	162	200++	200%++
Total tree plantings		**816**	**731++**	**90%++**

Notes: * ~3000 volunteer cottonwood seedlings, >12" tall in lower portion of pond. **Also ~300 volunteer willow seedlings, >12" tall.

Table 2. Shrubs installed at the North Portland Road Mitigation Site, 2006 Counts and % Survival.

Scientific Name	Common Name	Originally Installed	Counted 9/27/06	% Survival
Berberis (Mahonia) aquifolium	tall Oregon-grape	69	121	175%
Holodiscus discolor	ocean-spray	20	32	160%
Oemleria cerasiformis	Indian-plum	25	0	0%
Ribes sanguineum	red-flowering currant	39	13	33%
Rubus parviflorus	thimbleberry	33	0	0%
Rosa pisocarpa	swamp rose	34	34	100%
Sambucus racemosa	red elderberry	87	7	8%
Spiraea douglasii	Douglas' spirea	17	1	6%
Symphoricarpos albus	snowberry	26	95	365%
Total shrub plantings		**350**	**303**	**87%**

Thus far, both trees and shrubs are faring relatively well overall, due to high survival among several species, strong recruitment of cottonwood and willow seedlings, and remedial plantings.

Among tree species, red alder, cascara buckthorn, and Western crabapple have fared poorly, which is likely due to drought stress in the excessively drained sandy soils. By contrast, the wetter soils lower in the basin have been especially conducive to cottonwood and willow seedling establishment, with thousands of seedlings now over 12 inches in height. The overall tree counts are 90%, even without the inclusion of seedling recruits.

The shrub count revealed several species that have not established successfully, including Indian plum, red flowering currant, thimbleberry, red elderberry, and spiraea. By contrast, Oregon grape, oceanspray, snowberry and swamp rose have been highly successful thus far, especially in conjunction with remedial planting efforts. The poor success of most species can again be attributed to drought stress in the sandy soils outside of the lowest portions of the depression. Additional remedial plantings are not recommended due to certain species self propagating such as swamp rose and snowberry, which are suited to drier conditions.

3.2 Emergent Plantings and Native Groundcover Development

Three emergent species and seven grass species were introduced into the mitigation area in early spring 2004; the species and numbers planted are listed in Table 3 below. All of the emergent plugs were installed in tax lot 900 (Figure 3). The success of emergent plantings along with natural colonization of the site by native plant species is being assessed by visual estimates and photodocumentation.

Table 3. Emergent species installed at the North Portland Road Mitigation Site in 2004

Species	Common Name	Quantity (plugs)
Carex aperta	Columbia sedge	800
Juncus tenuis	slender rush	800
Scirpus microcarpus	small-fruited bulrush	600

Table 4. Grass seed mix broadcast at the North Portland Road Mitigation Site in 2004

Species	Common name	Amount/area
Beckmannia syzigachne	sloughgrass	0.1 lb./1000 ft^2
Bromus carinatus	California brome	1 lb./1000 ft^2
Deschampsia cespitosa	tufted hairgrass	0.2 lb./1000 ft^2
Elymus glaucus	blue wildrye	1 lb./1000 ft^2
Festuca occidentalis	western fescue	1 lb./1000 ft^2
Glyceria elata	tall mannagrass	0.1 lb./1000 ft^2
Hordeum brachyantherum	meadow barley	0.1 lb./1000 ft^2

The site appears to be meeting the City's requirement of ≥80% aerial cover of native species in the planted areas, based on visual estimation. Additionally, in the lower portions of the excavated area, emergents and grasses are exhibiting vigor and will likely contribute to the site's structural and species diversity over time.

The City's requirement of less than 10% invasive species within 10 feet of all areas of the mitigation site appears to have been met. However, along the northern slopes of the excavated area, Himalayan blackberry (*Rubus discolor*) is becoming established. The Himalayan blackberry should be controlled. Continued maintenance will contribute to the overall success of this site.

3.3 2005 Remedial Plantings (Additional Tax Lots 500 and 600)

A remedial planting effort was conducted in early spring 2005 by Ash Creek Forest Management (Ash Creek). This additional planting was not only conducted on the approved mitigation tax lot (tax lot 900), but also continued off-site into other tax lots (tax lots 500 and 600).

In discussions with Ash Creek, it was determined that all of the 1400 plants proposed in the first monitoring report were planted. However, their distribution across 3 tax lots makes it impossible to provide a baseline for determining survival rates in the remaining tax lots.

Plantings were counted on September 27, 2006, for tax lots 500 and 600. By using measuring tape, we attempted to separate what was initially planted from the recent remedial planting. However, it is apparent that remedial plantings occur in all of the tax lots. Thus, to allow a better tracking system of future installations, each plant should be tagged once it is planted, so the newly installed plants can be readily distinguished from previously installed plants.

Table 5 shows the plants counted in the additional tax lots. Survival rates are not shown because plantings were not originally specified for these tax lots.

Table 5. Remedial plantings counted in Tax lots 500 and 600 at the North Portland Road Mitigation Site

Species	Common Name	Counted 9/27/06
*Amelanchier alnifolia**	Pacific serviceberry	15
Berberis (Mahonia) aquifolium	tall Oregon-grape	62
Fraxinus latifolia	Oregon ash	39
Holodiscus discolor	oceanspray	2
*Physocarpus capitatus**	Pacific ninebark	2
*Pinus ponderosa**	ponderosa pine	38
Pseudotsuga menziesii	Douglas-fir	3
Rhamnus purshiana	cascara	20
*Sambucus cerulea**	blue elderberry	56
Symphoricarpos albus	snowberry	105
Total remedial plantings		**342**

*Species not in the original planting plan for TL 900

4.0 PHOTODOCUMENTATION

Photodocumentation of site conditions is intended to provide a visual record of vegetation changes over time. The photos that accompany this report (Photos 1-6, Figures 4-6) show site conditions on the September 27, 2006 site visit. The north side of the site has plant species that are taller and more vigorous than the southeast side of the property (Photos 1, 2, 4 and 5).

This may be attributable to the steepness of the southeast side of the site, resulting in less water penetrating the soil. However, the lower portion of the excavated area is doing very well with large cottonwood and willow recruits (Photos 3 and 6).

5.0 DISCUSSION AND CONCLUSIONS

This report documents the progress of the Smith Lake mitigation area on North Portland Road in Portland, Oregon after the third of three monitoring seasons. The report addresses terms and conditions of City permit LU 03-100430 EN EF. This is the last year of monitoring for this project, and the mitigation area is compliant with the permit requirements listed below.

1. 100% survival of trees and shrubs at the end of each growing season for a period of three years

Results:

There is over 100% survival for the trees on-site in tax lot 900, with the inclusion of the seedling recruits.

2. 80% or greater area cover of all mitigation planted areas with native shrub and groundcover species at the end of each growing season

Results:

Based on visual estimates and as depicted on site photos, there appears to be greater than 80% cover of native shrubs and groundcover species in Tax lot 900. Tax lots 500 and 600 also appear to have 80% or greater cover of native shrubs and groundcover species. Certain shrubs are exhibiting recruitment potential such as snowberry and swamp rose. Tax lots 500 and 600 had no original specified plantings but most of the plantings are healthy and contributing to site diversity.

2. Less than 10% area coverage with invasive species of all areas within 10 feet of mitigation plantings at the end of each growing season

Results:

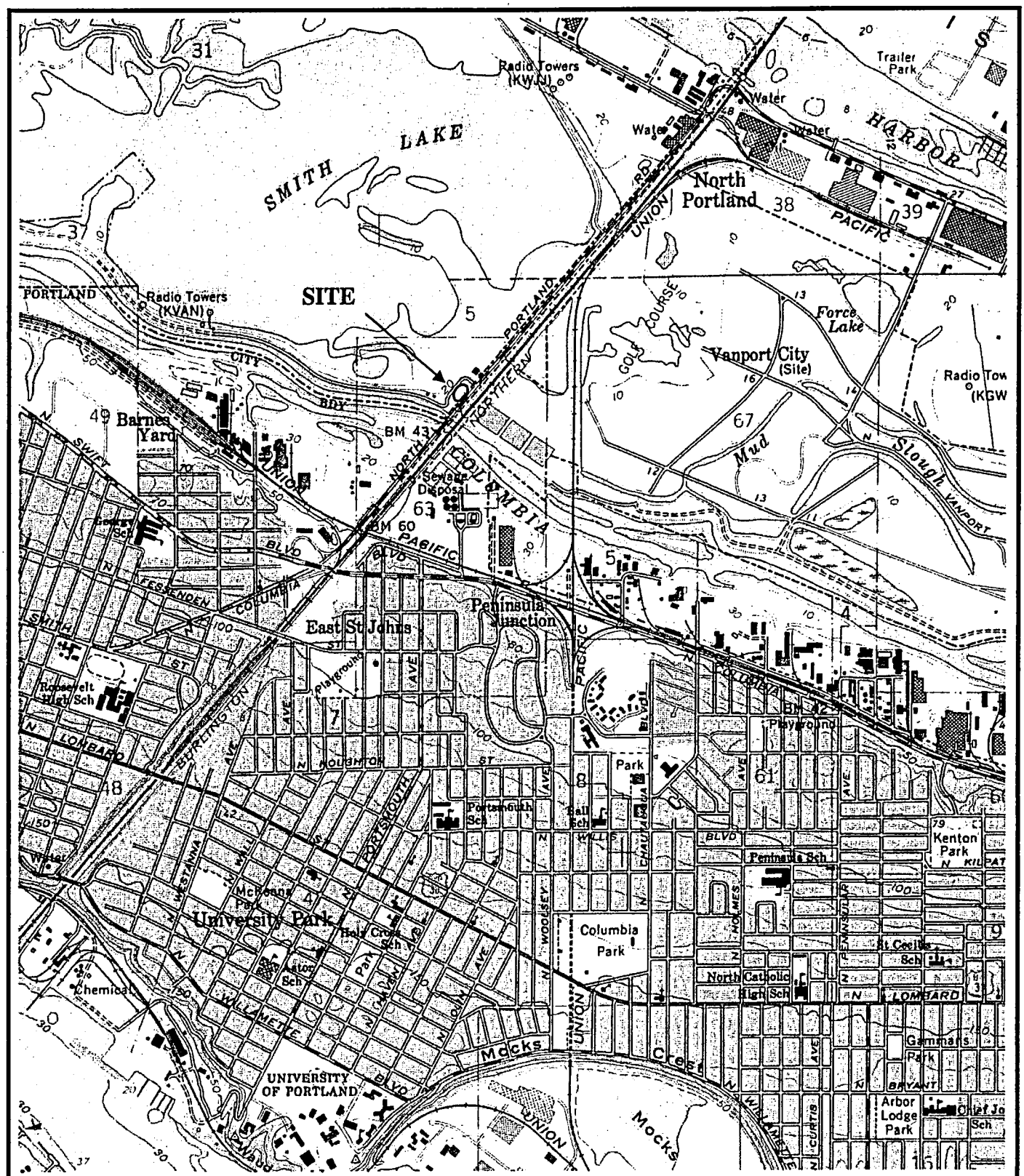
The whole mitigation area has less than 10% area coverage of invasive species. However, the northern and southwest areas in tax lot 500 and 600 should be monitored continually and efforts to maintain the Himalayan blackberry should be facilitated each year.

6.0 REFERENCES

Ash Creek Forest Management, 2005. Phone conversation with George Kral on 12/14/2005.

Appendix A

Figures



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Location and general topography for the Smith Lake restoration and mitigation area on N. Portland Rd. in Portland, Oregon (USGS, Portland, Oreg. – Wash. quadrangle, 1961, photorevised 1970 and 1977).

FIGURE 1

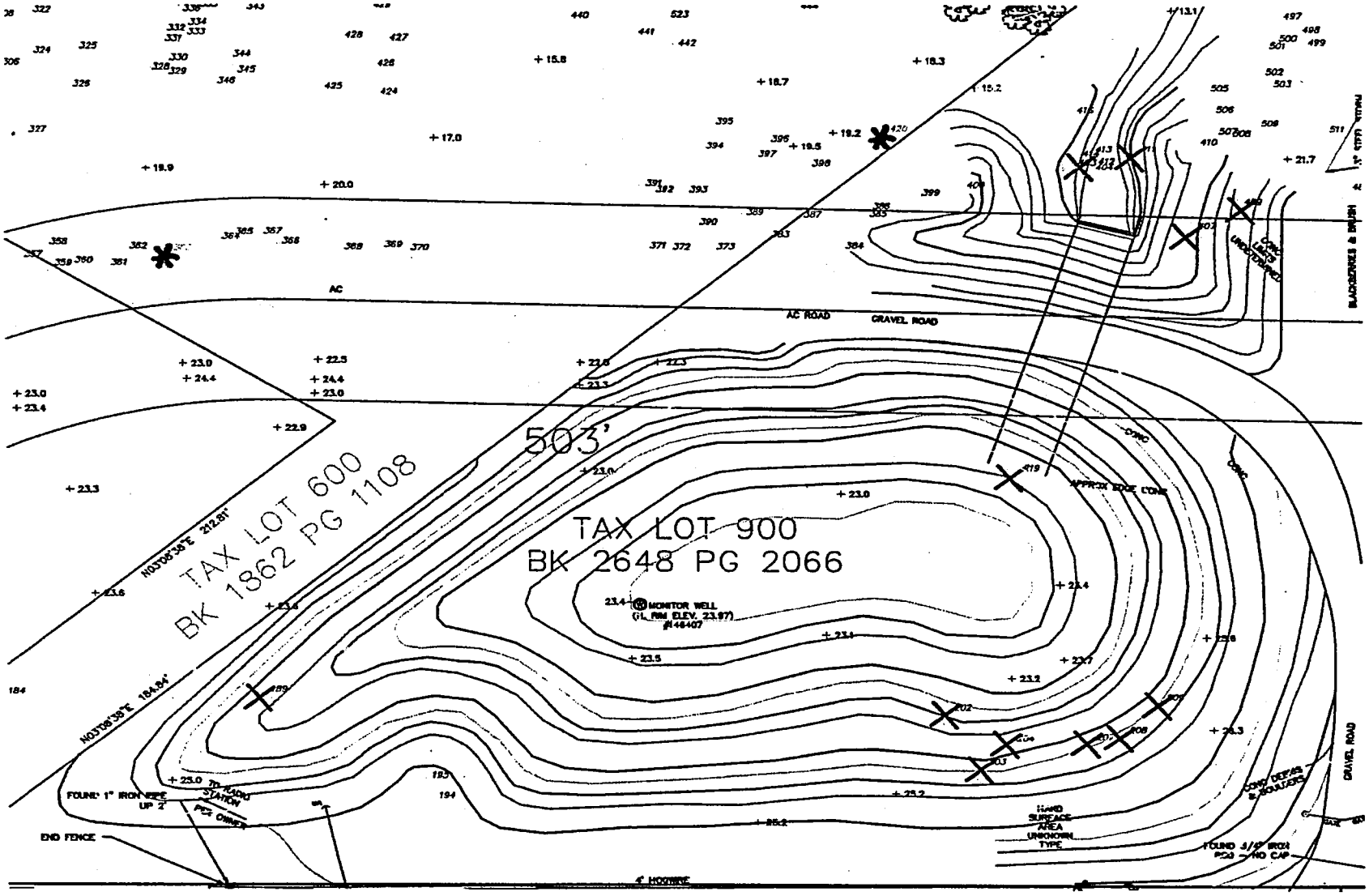

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FIGURE 2

Tax lot information for the Smith Lake restoration and mitigation area at North Portland Road in Portland, Oregon (Oregon Tax Maps, 2006).

2004 Installed Plants Above 25' Elevation

Scientific Name	Common Name	Quantity
TREES		
Acer macrophyllum	bigleaf maple	18
Pseudotsuga menziesii	Douglas fir	38
Rhamnus purshiana	cascara	53
SHRUBS		
Holodiscus discolor	oceanspray	20
Mahonia aquifolium	tall Oregon grape	40
Ribes sanguineum	flowering red currant	39

2004 Installed Plants Between 15-25' Elevations

TREES		
Alnus rubra	red alder	92
Crataegus douglasii	black hawthorn	98
Fraxinus latifolia	Oregon ash	129
Populus balsamifera trichocarpa	black cottonwood*	100
Rhamnus purshiana	cascara	50
SHRUBS		
Mahonia aquifolium	tall Oregon grape	29
Oemleria cerasiformis	indian plum	25
Rubus parviflorus	thimbleberry	33
Sambucus racemosa	red elderberry	87
Symphoricarpos albus	snowberry	26

2004 Installed Plants Between 13-15' Elevations

TREES		
Fraxinus latifolia	Oregon ash	40
Pyrus diversiloba	western crabapple	36
SHRUBS		
Rosa pisocarpa	swamp rose	34
Salix sitchensis	Sitka willow	75

2004 Installed Plants Below 13' Elevation

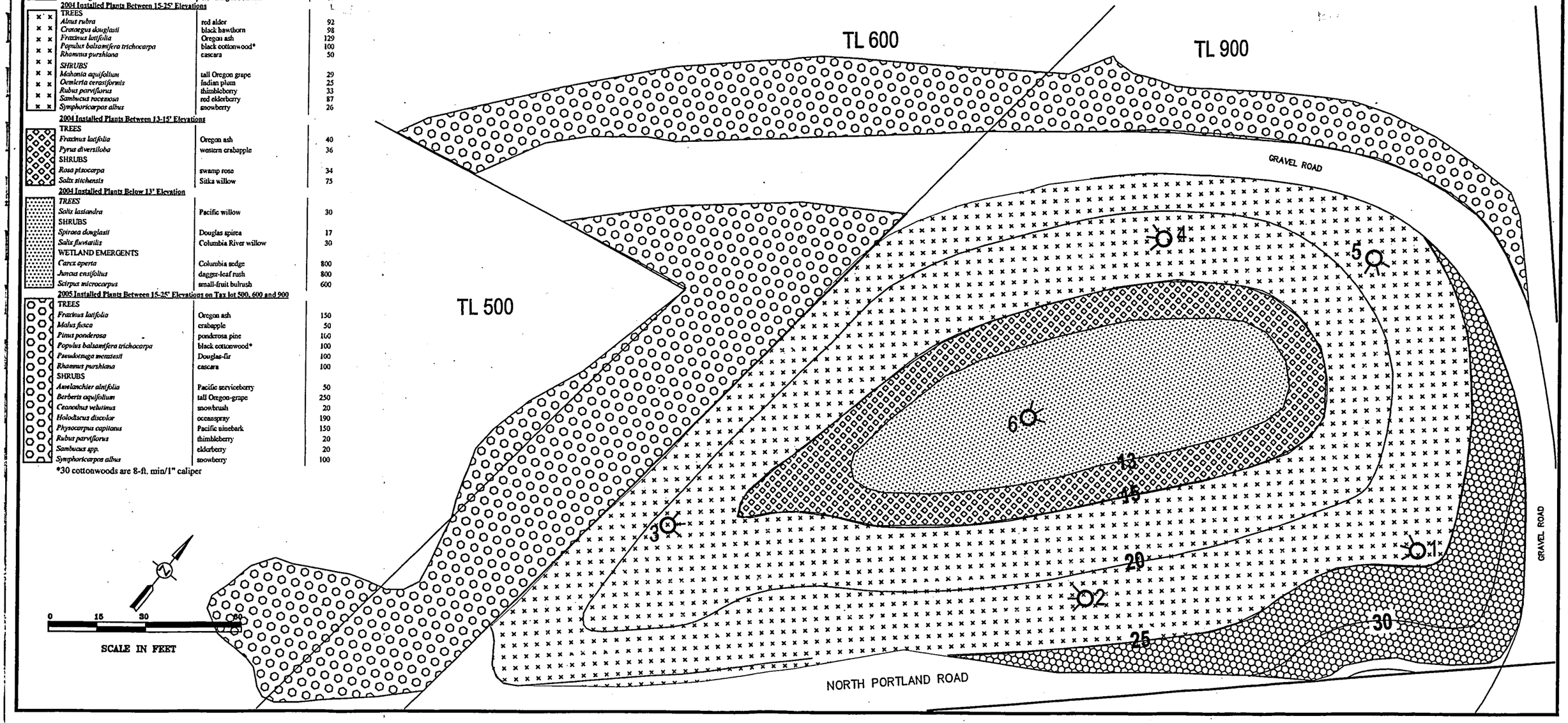
TREES		
Salix lasiandra	Pacific willow	30
SHRUBS		
Spiraea douglasii	Douglas spirea	17
Salix fluviatilis	Columbia River willow	30
WETLAND EMERGENTS		
Carex aperta	Columbia sedge	800
Juncus ensifolius	dagger-leaf rush	800
Scirpus microcarpus	small-fruit bulrush	600

2005 Installed Plants Between 15-25' Elevations on Tax lot 500, 600 and 900

TREES		
Fraxinus latifolia	Oregon ash	150
Malus fusca	crabapple	50
Pinus ponderosa	ponderosa pine	100
Populus balsamifera trichocarpa	black cottonwood*	100
Pseudotsuga menziesii	Douglas-fir	100
Rhamnus purshiana	cascara	100
SHRUBS		
Amelanchier alnifolia	Pacific serviceberry	50
Berberis aquifolium	tall Oregon-grape	250
Ceanothus velutinus	snowbrush	20
Holodiscus discolor	oceanspray	190
Physocarpus capitatus	Pacific ninebark	150
Rubus parviflorus	thimbleberry	20
Sambucus spp.	elderberry	20
Symphoricarpos albus	snowberry	100

*30 cottonwoods are 8-ft. min/1" caliper

1 PHOTODOCUMENTATION POINT



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Planting plan for Smith Lake restoration and mitigation area on North Portland Road in Portland, Oregon.

FIGURE 3

Pacific Habitat Services, Inc.

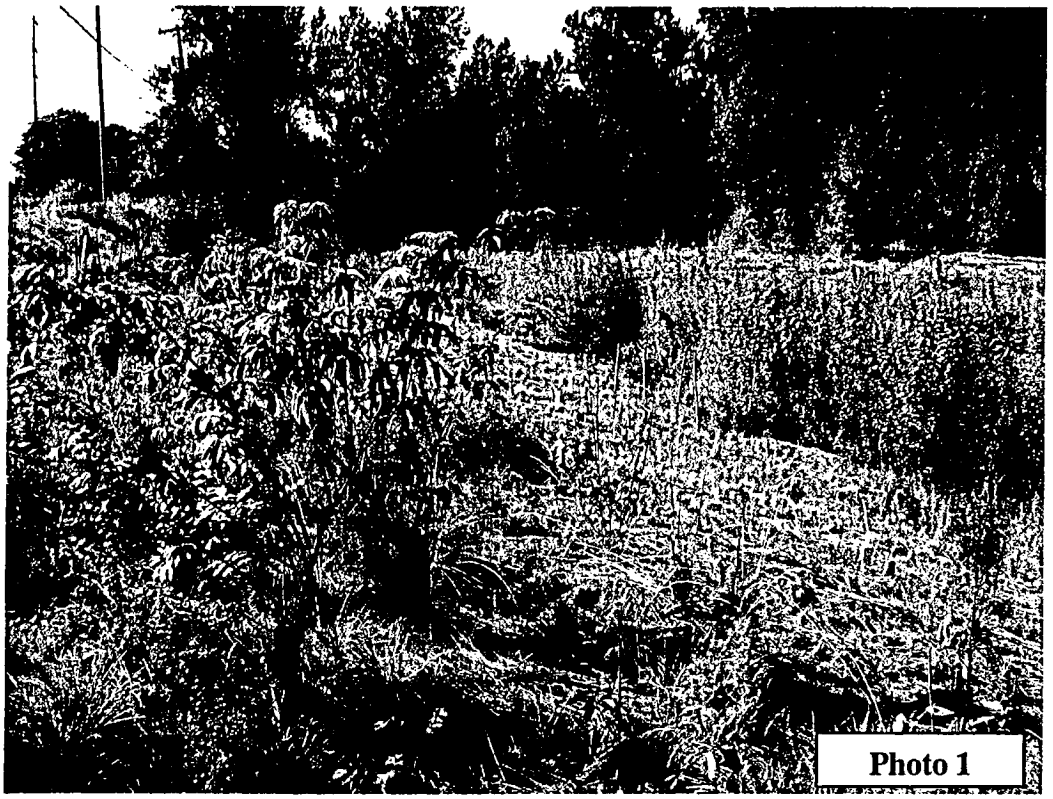

Photo 1

Photo 2

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Photo documentation of the Smith Lake Restoration and Mitigation Area North Portland Road, Portland, Oregon. Photo 1 shows the south side of the mitigation area, looking west. Photo 2 shows the south side of the mitigation area, closer to tax lot 600. Photos taken on 9/27/06.

FIGURE 4

Photo 3

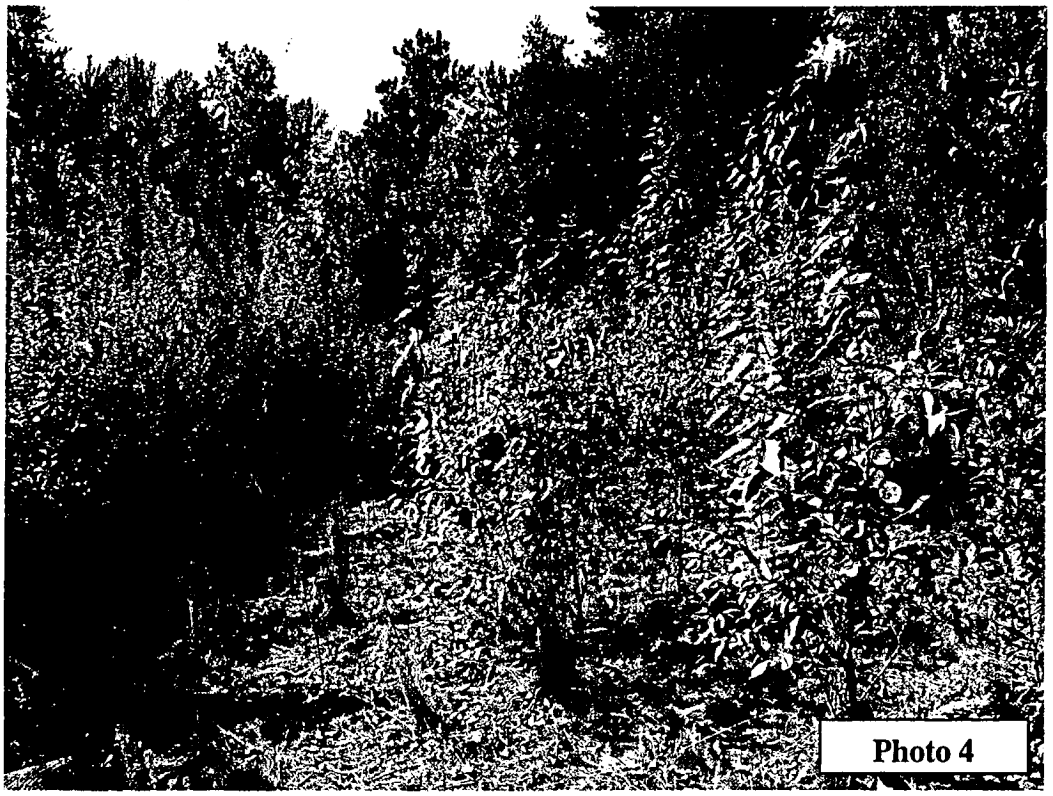

Photo 4

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Photo documentation of the Smith Lake Restoration and Mitigation Area North Portland Road, Portland, Oregon. Photo 3 shows the lower portion of the excavated area, looking east. Photo 4 shows the north side of the mitigation area, looking west. Photos taken on 9/27/06.

FIGURE 5

Photo 5

Photo 6

11/20/06

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Photo documentation of the Smith Lake Restoration and Mitigation Area North Portland Road, Portland, Oregon. Photo 5 shows eastern portion of the mitigation area, looking south. Photo 6 the middle of the wetland area, looking east. Photos taken on 9/27/06.

FIGURE 6