PORTLAND PARKS & RECREATION

Healthy Parks, Healthy Portland

Protect the Best - Invasive Vegetation Management Program
Biannual Report FY 2013-2014
June 2014

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(1) Project Overview

Portland Parks and Recreation (PPR) owns and manages ecologically healthy habitat that supports wildlife and provides unique opportunities for people to experience nature. *The Protect the Best Invasive Plant Management Program* (PTB) is designed to treat and prevent invasive infestations in PPR's natural areas by identifying and treating ecologically healthy habitat and then creating relatively invasive-free "buffer habitat" surrounding it. PTB staff removes targeted invasive species including English ivy, Irish ivy, English holly, Himalayan blackberry, and garlic mustard. Treatments are tracked in an ArcGIS database. The PTB program is expected to reduce total invasive vegetation on a greater number of acres, at lower cost, and using less herbicide, as compared with other invasive vegetation management approaches.

This citywide project on public property is funded by PPR and the Bureau of Environmental Services (BES). The program is implemented per an annually revised Memorandum of Understanding (MOU) between PPR and BES. The PTB program removes invasive vegetation on PPR property to further the goals of the City of Portland's Invasive Plant Management Strategy.

Site Selection Criteria

1) Ecological health
2) Creation of large areas of invasive-free habitat (vs. many small unconnected areas); building on previous work
3) Proximity to and contiguity with other natural areas
4) As even a geographic distribution throughout Portland as possible (equity of service)
5) Unique habitat may receive special consideration, e.g., oak and madrone forest.

(2) Review of "Services Delivered by PPR" as described in the 2013-2014 PPR-BES MOU

PPR has a single year-round work crew which typically consists of three Botanic Technician 1s and one Botanic Specialist 2 (crew leader). The crew removes non-native, invasive species using loppers, handsaws, chainsaws, and herbicide applications. All Botanic Technicians and the Botanic Specialist 2 have state-certified pesticide applicator licenses.

PTB conducts two types of treatments: 'small tree' treatments and 'vine-forb' treatments. Small tree treatments consist of removing small invasive non-native trees (<12" dbh), ivy and clematis growing on trees, and small patches of blackberry, ivy, and clematis on the ground using chainsaws, hand tools, and herbicide in spray bottles. Vine-forb treatments consist of foliar spray treatment of larger invasive patches or extensive areas covered with smaller patches of vines and forbs using backpack sprayers, cut-stump treatment with hand tools and spray bottles, or a combination of both methods.

A schedule of initial and retreatment acres was developed by PPR natural resource ecologists and natural area supervisors for inclusion in the MOU (Appendix 1). Table 1 in this report is an amended schedule of treatments that also shows the actual number of acres completed in fiscal year 2013-2014. "Initial acres" refer to acres that were treated for the first time by PTB during this fiscal year but that had not been treated in previous years. "Retreatment acres" refer to acres that have already received an initial treatment by PTB.

In FY 2013-2014 PTB planned initial small tree or initial vine-forb treatments on 161 acres of PPR natural area habitat that is in adequate ecological health to meet PTB treatment criteria (Table 1). Most of these acres are in central Forest Park, which are areas previously treated by the BES Watershed Revegetation Program in summer 2010. Although these acres were treated once before, they are considered initial small tree treatment acres for PTB. Big 4 Corners and parts of Oaks Bottom are other sites that have benefited from BES vegetation management in the past, and are now being treated by PTB. This fiscal year 161 initial acres were treated on these three sites.

PTB planned small tree retreatments and vine-forb retreatments on 713 acres that PTB treated at least once previously (Table 1). Small tree retreatments are scheduled two years after the initial treatments. Some vine-forb treatments, however, may be scheduled one year later or even in the same year. Of the scheduled retreatments, 540 acres were in Forest Park. These treatments include small tree retreatments, and garlic mustard and other vine-forb retreatments. Retreatments are given priority over initial treatments because retreatments protect prior investment of resources. This fiscal year 620 acres were retreated.

Table 1. Proposed Work Sites for FY 2013-14 and the acres completed on proposed sites in FY 2013-2014 MOU, amended in January 2014

Initial Treatments	Ecological Health	Target Acres	Treated Acres
East			
Big Four Corners NA	Fair	17	7
Oaks Bottom NA	Fair	44	61
West			
Forest Park	Good/Fair	100	93
Total		161	161
Retreatments			
East			
Big 4 Corners	Good/Fair	105	86
Buttes NA	Good/Fair	3	3
Elk Rock Island	Fair	2	2
Mitchell Creek NA	Good/Fair	2	2
Oaks Bottom	Fair	44	14
Powell Butte Nature Park	Good/Fair	17	18
West			
Forest Park	Good/Fair	540	493
Maricara Park	Good	2	2
Total		**713**	**620**

Expected Program Outcomes in FY 2013-2014

1) Perform 161 acres of initial treatments and 713 acres of retreatments controlling small trees, and vines and forbs, primarily English holly, Irish ivy, English ivy, and Himalayan blackberry;
2) Track all treatments in an ArcGIS database developed by PPR;
3) Provide bi-annual reports to BES and PPR management;
4) Treat garlic mustard and other EDRR species for 2-3 weeks in the spring.

(3) Invasive, Non-Native Vegetation Removal

The PTB program has made approximately 3,900 acres of initial treatments and 3,700 acres of retreatments of mostly small invasive trees since 2007, but also vines and forbs (Appendix 2). In fiscal year 2013-2014 initial treatments were planned for Big Four Corners Natural Area, Oaks Bottom Wildlife Refuge, and Forest Park, and retreatments were planned for Big 4 Corners Natural Area, Buttes Natural Area, Elk Rock Island, Mitchell Creek Natural Area, Oaks Bottom Wildlife Refuge, Powell Butte Nature Park, and Forest Park (Table 1). Compared with the 2013-2014 MOU, this list has an overall reduction in number of acres (see Appendix 1 for treatment schedule from MOU). Two days of treatment at Maricara Park were added to the schedule in June.

Like last year, vine-forb treatments conducted in summer 2013 at Big 4 Corners were time-intensive and additional treatments were scheduled in the spring for this reason. As a result, 100 instead of 200 acres of initial small tree treatments in Forest Park and 4 instead of 60 acres of retreatment at Mitchell Creek NA were planned. Errol Heights NA and Whitaker Ponds were removed altogether from scheduled treatments for this fiscal year.

Small Tree Treatments
PTB completed 144 acres of initial small tree treatments at Big 4 Corners NA, Oaks Bottom WR and Forest Park (Table 2). Approximately 1435 English holly and 170 cherry, hawthorn, and other invasive tree species were treated this fiscal year. Since the start of the program a total of 14,700 small tree treatments have been made. These treatments are typically cut-stump treatments, but occasionally foliar applications are made as well. PTB performed small tree retreatments on 444 acres, the majority in Forest Park (Table 2).

Vine-Forb Treatments
In past years, PTB vegetation management consisted primarily of small tree cut-stump treatment of holly, hawthorn, and non-native cherry, and removal of small patches of invasive vines and forbs. As the crew works on more sites like Big 4 Corners Natural Area and Oaks Bottom, where patches of invasive vines and forbs can be larger and more widespread, backpack spray treatment is becoming increasingly common. Vine-forb treatments are time intensive, not least because the final steps of removal often involve using pruners or hand saws with a hand spray bottle to cut and treat non-native vines that are growing intertwined with native shrubs. PTB has performed 68 acres of initial vine-forb treatments and 190 acres of vine-forb retreatments (Table 2).

In Forest Park PTB occasionally encounters patches of English ivy, Himalayan blackberry, and clematis during small tree treatments that are set aside for later treatment, usually because weather conditions or the equipment at hand do not allow for immediate treatment. In these cases, PTB

takes a GPS point to mark the vegetation for later removal. PTB retreated 31 acres of ivy in Forest Park using foliar spray.

Garlic mustard treatments have demanded approximately 10 days of foliar spray work this fiscal year and had pulling by the PTB crew in past years, however this year the crew devoted approximately 20 days to garlic mustard treatments to fill in for work that BES contract crews had done in the past at Oaks Bottom WR.

Table 2. Small tree and vine-forb acreage of initial and retreatments, by site

	Initial Treatment		Retreatment			
	Small Tree (ac)	*Vine Forb (ac)*	*Small Tree (ac)*	*Vine Forb (ac)*	*Treatment Time (d)*	ac/d
Big 4 Corners NA		7			2	4
Big 4 Corners NA	7				1	7
Big 4 Corners NA - Thistle/Blackberry				11	18	1
Big 4 Corners NA-Thistle				75	5	15
Buttes NA				3	2	2
Elk Rock Island				2	2	1
Forest Park			426		35	12
Forest Park				31	6	5
Forest Park-Garlic Mustard				36	11	3
Forest Park	93				34	3
Maricara Park				2	2	1
Mitchell Creek NA				2	2	1
Oaks Bottom WR				14	4	4
Oaks Bottom WR	44				22	2
Oaks Bottom WR		44			31	1
Oaks Bottom WR-Garlic Mustard				14	2	7
Oaks Bottom WR-Garlic Mustard		17			9	2
Powell Butte NP			18		6	3
TOTAL	**144**	**68**	**444**	**190**	**194**	

Assessment of Progress in FY 2013-2014

Acreage goals set out in this fiscal year's MOU have been scaled back from earlier years of the program due to the increasingly dense and varied invasive vegetation encountered on the sites PTB now treats, and the additional treatment time needed. A couple of factors have influenced PTB progress toward meeting goals. Vine-forb treatments continue to be time-intensive, requiring more time than anticipated at the time the MOU was written. PTB did not complete all of the retreatments at Big 4 that were planned. Although thistle treatments were completed, only ¼ of blackberry foliar treatments were completed. Both BES and PPR management have expected this trend of increasing treatment time and more forb-vine treatments, as PTB works through the inventoried vegetation units from most ecologically intact to more degraded areas of the PPR system. Another factor reducing output this fiscal year is the absence of one crew member from October through December.

GPS Data Recording
PTB continues using an ArcGIS database to track fieldwork, including invasive species, their size, treatment type required, and date of treatment.

(4) Monitoring

PTB has conducted two types of monitoring: (1) Holly treatment efficacy monitoring, and (2) Native vegetation regeneration monitoring. Holly efficacy monitoring was completed in 2011. Vegetation regeneration monitoring is ongoing.

The goal of holly treatment monitoring is to measure the effectiveness of holly cut-stump treatments, the predominant treatment performed by PTB. The crew records the presence of regrowth on treated holly and then re-treats if necessary by pulling, cutting, or applying herbicide. The goal of the native regeneration monitoring is to determine the pace and diversity of native plant reestablishment in areas where holly have been removed. Percent cover of forbs and shrubs around holly that have been removed will be recorded every two years.

Holly Treatment Efficacy Monitoring
PTB developed and implemented a "rapid" protocol to monitor holly regrowth at the same time that retreatment is performed. PTB monitored 276 acres in FY 2008-2009, 486 acres in FY2009-2010 and 70 acres in FY2010-2011. Efficacy monitoring involves locating previously treated holly using GPS data, and recording the presence or absence of (1) stump sprouts (regrowth from the main stems, largest 3 stems > 2" dbh) and (2) smaller resprouts of runners on the ground within the immediate vicinity, typically within the former drip line of the holly. First year results were presented in a meeting with BES and PPR staff in FY 2009-2010. Results of FY 2008-2009, FY 2009-2010, and FY 2010-2011 monitoring will be presented in a separate report. These monitoring results have confirmed the need for retreatment.

Native Regeneration Monitoring
PTB developed a protocol to measure the re-colonization of native plants in the disturbed area under holly that were removed in Forest Park (30 removed trees) and Powell Butte (10 removed trees). Immediately after the holly were removed, baseline data were collected in July and August 2009 on holly size, and percent cover of forbs and shrubs. The data will be analyzed to determine the diversity of newly established native vegetation and the time to re-colonize the disturbed patches. Monitoring occurred in FY 2009-2010, FY 2010-2011, and FY 2012-2013. The next round of monitoring is scheduled to occur in 3-5 years. Results of data that have already been gathered will be presented in a separate report. Native regeneration monitoring is designed to demonstrate how well our treatment model works, namely removing invasive vegetation and allowing native vegetation to naturally recolonize without plantings.

(5) Planned Activities in FY 2014-2015

Treatments in FY 2014-2015 will focus on the following:
1. Small tree retreatments in Forest Park
2. Vine-forb retreatments in Forest Park, Oaks Bottom Wildlife Refuge, Big 4 Corners Natural Area, and Mitchell Creek Natural Area
3. Initial small tree treatments in Forest Park and Foley-Balmer Natural Area
4. Garlic mustard treatments (EDRR) in Forest Park and Oaks Bottom

Appendix 1. Schedule of treatments from 2013-2014 MOU

Table 1. Schedule of Treatments FY 2013-2014

Initial Treatments	Ecological Health	Acres
East		
Big Four Corners NA	Fair	20
Oaks Bottom NA	Fair	44
Whitaker Ponds	Good/Fair	2
West		
Forest Park	Good/Fair	200
Total		**266**

Retreatments	Ecological Health	Acres
East		
Big 4 Corners	Good/Fair	53
Elk Rock Island	Fair	10
Errol Heights NA	Fair	10
Mitchell Creek NA	Good/Fair	60
Oaks Bottom	Fair	44
Powell Butte Nature Park	Good/Fair	17
West		
Forest Park	Good/Fair	604
Total		**798**

Appendix 2. Initial and retreated acres, fiscal years 2007-2008 through 2013-2014.

	FY07-08		FY08-09		FY09-10		FY10-11		FY11-12		FY12-13		FY13-14		Total Ac	
	Init.	*Ret.*	*Init.*	*Ret.*	*Init.*	*Ret.*	*Init.*	*Ret.*	*Init.*	*Ret.*	*Init.*	*Ret.*	*Init.*	*Ret.*	*Init.*	*Ret.*
Forest Park	823		588	435	499	387	351	559	484	513	264	500	93	493	3102	2887
Maricara Park	17					17								2	17	19
Marshall Park					4										4	0
East Zone															0	0
Big 4 Corners NA									22		64	86	7	86	93	172
Bundy NA					4			4							4	4
Buttes NA			9		2		113	9				124		3	124	136
Campfire NA															0	0
Clatsop Butte Park			27					18							27	18
Deardorf Creek NA											3				3	0
Elk Rock Island	5		2		3	4		6				5		2	10	17
Errol Heights NA									7			10			7	10
Mitchell Creek NA	71					67						4		2	71	73
Oaks Bottom													61	14	61	14
Powell Butte NP			171		72		69	171	13	83	4	8		18	329	280
Tideman Johnson NA									8			8			8	8
Whitaker Ponds			3								2				5	0
Total	**916**	**0**	**800**	**435**	**584**	**475**	**533**	**767**	**534**	**596**	**337**	**745**	**161**	**620**	**3865**	**3638**