



PORTLAND PARKS & RECREATION

Healthy Parks, Healthy Portland



2004-2007 Pesticide Free Parks Trial Program

November 6, 2007

Portland Parks and Recreation
2004-2007 Pesticide Free Parks Trial Program
Summary, Overview, Assessment and Evaluation

November 6, 2007

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Abor Lodge Park

Executive Summary



In fall of 2004, Portland Parks and Recreation responded to a request from the *Pesticide Free Partners*, a coalition of groups led by the Northwest Coalition for Alternatives to Pesticides (NCAP). The partners requested that PP&R provide park sites that would be managed without the use of pesticides and offered to recruit the volunteer labor needed to carry out the expected weed control for these sites. PP&R agreed to a three-year trial program in three selected parks to determine if volunteer driven pesticide free parks were a viable and sustainable management option for maintaining park land. This trial program was completed in October of 2007.

Public participation, outcomes, and impacts of the PFP program were documented throughout the trial to determine program success in meeting PP&R goals and responsibilities. Important criteria for success included support of general and recreational park uses and bureau priorities, adequate volunteer involvement, fulfillment of park user group needs, and fiscal feasibility.

The program was coordinated by two paid positions. A staff member at NCAP took on the volunteer coordination role and a PP&R Horticulturist acted as the program coordinator. The resulting partnership was formalized through a Memorandum of Understanding (MOU) outlining the expectations of the program and criteria for program evaluation. Inputs were tracked over the course of the trial and the condition of the park monitored to ensure PP&R standards were met.

During the three years volunteer work parties were held 1 to 2 times per month and weeds removed through hand, mechanical and cultural methods. Over the three years 244 volunteers put in 1,374 hours removing weeds at the three parks. At this level of volunteer labor it was possible to maintain weeds in the parks at levels comparable with other Portland Parks, and park management goals were generally met. This level is not a weed free level but a level at which weeds are not determined to have a detrimental effect on a park users enjoyment of the park either through being aesthetically displeasing or causing a hazard in the park.

Required inputs to carry out the trial included both PP&R labor, non-PP&R paid labor, volunteer labor and materials costs. The paid labor and material costs of the pesticide free parks were tracked both in total cost and in ongoing costs (total cost minus one-time, start-up costs). Actual average annual per park costs were determined to be \$6,771. When adjusted for start-up costs, the annual per park ongoing cost was determined to be \$3,621 per year. Start-up costs were an additional \$9,455 per park.

Executive Summary

Continuation of the three parks in the same management model as the trial will require a continuation of current PP&R staff labor and materials costs. Additionally, the volunteer coordination duties of the NCAP staff member will need to continue, or be replaced by paid PP&R staff time. Volunteer labor support will also need to be continued at the current level indefinitely (117.8 hours), as will the vital work of the neighborhood based Key volunteers at each park site.

Based upon data available, adding one additional PFP park site of similar size and weed burden would require start-up costs of \$9,455, and an ongoing annual funding of \$3,621 plus a volunteer labor force providing 117.8 hours per year, a new dedicated neighborhood Key Volunteer, and other inputs. The actual start-up cost of adding one additional PFP park site may be somewhat less post this 3-year trial as the language for the MOU has already been determined. Irrespective of feasibility and costs, many parks are not suitable for this management style due to factors such as high weed pressure, size, invasive weed presence, and other factors.



*Lair Hill
Park*

Establishment of the Trial Program

INCEPTION

In fall of 2004, Portland Parks and Recreation responded to a request from the *Pesticide Free Partners*, a coalition of groups led by the Eugene-based Northwest Coalition for Alternatives to Pesticides. The partners requested that PP&R provide park sites that would be managed without the use of pesticides. They also offered to recruit the volunteer labor needed to carry out the expected weed control for these sites. PP&R agreed to a three-year trial program in three parks to determine if volunteer driven pesticide free parks were a viable and sustainable management option for maintaining park land. This Pesticide Free Parks (PFP) trial program was completed in October of 2007.

Public participation, outcomes, and impacts of the PFP program were documented throughout the trial to determine program success in meeting PP&R goals and responsibilities. Important criteria for success included support of general and recreational park uses and bureau priorities, adequate volunteer involvement, fulfillment of park user group needs, and fiscal feasibility.

PRIOR MANAGEMENT: PP&R IPM PROGRAM

It is important to note that pests, including weeds, in all of Portland's parks are currently managed through *Integrated Pest Management* (IPM), a standard for responsible and sustainable land management. IPM uses many strategies to achieve goals, combining cultural, physical, biological and pesticidal methods in a holistic and informed manner. Many citizens are not aware that our program has eliminated much pesticide use, removed unsuitable pesticides from use, and has been used as a model for environmentally sensitive land management throughout the country. For example, a typical PP&R neighborhood park is not treated with insecticides or other highly toxic substances, and only a small quantity of low toxicity, biodegradable herbicides are typically applied to shrub beds, tree circles and fence lines. PP&R is also the only park system to have been certified *Salmon Safe* and our practices have been chosen as a national template for weed and pest management near waterways containing endangered fish. Portland Parks and Recreation's IPM approach responsibly addresses health, economic and environmental concerns, and has been used as a model for other park systems. Additional information regarding this PP&R program is available on the PP&R public website.

PFP MEMORANDUM OF UNDERSTANDING

A Memorandum of Understanding (MOU) (see Appendix C) was adopted by PP&R and the Pesticide Free Partners outlining program goals, partner responsibilities, evaluation criteria, maintenance standards and practices, and volunteer coordination. Portland Parks & Recreation worked with the partners to document and communicate acceptable park maintenance standards to assure park needs were fulfilled. A park maintenance guide (attached as part of the MOU) was also provided to volunteers so that they were able to evaluate the weed control required at the parks.

The MOU was developed with Portland Parks and the Pesticide Free Partners combining their view of the trial program. Issues resolved were park choice, maintenance standards, equipment use, volunteer safety, volunteer coordination, program evaluation and consequences if trial parks were not maintained at the desired level. The final MOU was a very inclusive document outlining specifics of the program. During the start-up phase of the trial much of the time spent by parks staff was in meetings discussing MOU language and preparing an agreement agreeable to both Parks and the PFP Partners. Park's management and the PFP partners representative signed the document in June 2006.

SELECTION OF TRIAL PROGRAM PARK SITES

Lair Hill, Sewallcrest, and Arbor Lodge Parks were designated as the three trial parks. Potential trial parks were screened for various criteria, and sites selected to represent typical neighborhood parks with standard amenities. These included playgrounds, ballfields, trees, and open grass areas. Two of the chosen parks have designated dog off-leash areas. The parks are small to moderate in size, Arbor Lodge Park being the largest at 8.4 acres. The parks are located in SE, SW and North Portland. The selected parks also have minimal area devoted to shrub beds or have shrub beds that require minimal upkeep. Lair Hill Park has a relatively large square footage of shrub beds though much of it has low weed pressure making it a suitable site. The selected parks also could not have any natural areas, this was specified as there are existing invasive weed removal programs and volunteer groups at many natural area parks. It was determined that we should not disrupt any of that work which was already in progress. Any parks which were undeveloped or soon to have construction were also dismissed as this would disrupt the work of the PFP volunteers. Finally the park must have good access for volunteers and no safety concerns which would make work hazardous. A complete listing of screening criteria is located in Appendix A.

Trial Program Activities

TRIAL WORK PARTIES

During the trial period no weed controlling herbicides were used in the three parks. Instead of these materials, volunteer work parties hand weeded, flame weeded, and placed mulch to manage weeds. The hand tools used most commonly by the volunteers were hula hoes and small digging forks along with wheelbarrows, shovels and rakes. Initially very little mulching was done by the work parties but this became a more extensive practice to help reduce weed growth. Work parties with large turnouts, occurring once or twice a year, were used to place mulch. Student and community volunteer programs were tapped for the additional labor. The program coordinator scheduled mulch deliveries to be made by PP&R's equipment division, with a two week lead time needed. The preferred mulch used was PP&R's Urban Forestry division wood chips. These chips are used throughout Portland's parks, and provide the best weed barrier. PP&R staff also continued to employ their standard forms of non-herbicidal integrated pest management methods in these parks, such as aerating and overseeding of the park turf and mowing at the correct height and frequency to minimize weeds.

On a typical work party day the Key volunteer arrives and unlocks the tool storage box and unloads tools. As volunteers arrive they sign PP&R's required insurance forms and then are assigned a task for that day. PP&R provides gloves as well as all the tools required. Tasks range from shoveling mulch, pushing a wheelbarrow, spreading mulch, hand weeding or weeding with hula hoes. Weeds are collected and placed in bags or piles for pick up and disposal by PP&R maintenance staff. The Key volunteer makes sure all tools are returned to the toolbox and then secures the box. They also fill in paperwork showing the number of person hours spent and on what task. This information along with the completed insurance form is mailed to the PFP program coordinator.

A small number of volunteers have been designated to control weeds by using propane flame weeding equipment. These individuals receive additional training to assure operation of this equipment will not create a safety hazard or harm park property. A flame weeding volunteer is then allowed to burn weeds on the bare ground areas of ballfields and on certain paved or gravel areas. The flame weeding volunteers have been allowed to work independently of the main volunteer group so they are able to flame weed more often than once per month. They will often burn sites a week prior to a work party and then again on the work party day. For more information on this tool refer to the Flame weeder section (pg 45).

TRIAL MONITORING

To adequately evaluate the PFP trial, a wide variety of trial park inputs were recorded and tracked. These inputs included volunteer and staff hours required, equipment and supply costs, propane use for flame weeding, and how the trial program affected park maintenance standards.

A maintenance summary sheet referred to as the PFP Maintenance Check List was developed for each park. These were used by the Key volunteers during work parties to determine priority areas for weed management. They were also used during quarterly walk throughs attended by the Program Coordinator, Volunteer coordinator and Park maintenance zone supervisors. The walk throughs were established to allow for communication and feed back on issues such as adherence to park standards, general park appearance, maintenance problems, and any concerns from zone maintenance supervisors. The walk throughs were scheduled to last 30 minutes at each park. After these meetings, work was scheduled for volunteers to address any areas of concern. For example, on a few occasions these walk throughs identified heavy weed loads that were made a priority at following work party. Notes from the quarterly walk throughs usually identified areas where weeding was deficient or over looked. A check list system helped to maintain consistency on the walk throughs and seldom did items appear on back-to-back inspections.

Examples of comments from quarterly walk throughs were:

“Kevin would like tree wells squared up and mulched”

“Need to repeat flaming on sidewalk cracks”

“Tree wells need a little attention”

“Overall all areas of the park look very good”

“Need mulch done”

The quarterly walk throughs were an extremely important part of the monitoring process especially when relaying park maintenance expectations to the Key Volunteers. This became an open forum for the sharing of information between the Volunteers and parks maintenance staff. It was also important to identify the work that was considered outside the volunteer’s area of concern. Sometimes Key volunteers had general maintenance observations to share with maintenance staff and this was the ideal forum for sharing those concerns.

Volunteer hours were also tracked throughout the trial and recorded in a volunteer database. This information was submitted quarterly to parks volunteer services. Also tracked were hours spent by the program coordinator on the trial as well as time spent by any other park staff whose activities were directly related to, or resulted because of, the PFP trial.

TRACKING PFP TRIAL EXPENSES

Portland Parks and Recreation employees track time spent on various projects using a work order system. Using the work orders it was possible to determine the amount of time spent on various activities in the Pesticide Free Parks program. The work was distinguished by the park location where work occurred and if the work was considered of benefit to the program as a whole or just one specific park. The general program hours were divided into those activities that were one-time events associated with the start-up of the trial program. Ongoing costs were tracked separately. Start-up activities included MOU development, volunteer training material development, selection of parks, creation of signs, flyers and walk through forms and other activities. Ongoing activities included ordering materials, delivering mulch, entering volunteer information into the data base, filling propane tanks, repairs to signs, working at some of the work parties, hauling additional tools for large work parties, quarterly walk throughs and other activities. The PFP did create additional work for the park zone maintenance staff, including pickup of debris and weeds left after the work parties. In addition, zone staff were required to attend quarterly walk throughs of the parks. Costs were also tracked in separate labor and parts categories. Labor for the Program Coordinator was charged at the City Nature Horticulturist bill-out rate of \$32.94 per hour, and other labor was charged by the work unit involved which may be more or less than the Horticulturist rate depending on the work unit. Parts or materials were charged at the actual cost, these included parts for repairs and replacement of equipment, gloves, plastic bags, paper products, printed materials, and other materials used during the course of the trial.

TRIAL ASSESSMENT STRUCTURE

The trial program was set up to be evaluated annually, with final summary report due after completion of the three year trial. Goals and evaluation criteria were laid out in the Pesticide Free Parks MOU.

Program Evaluation Criteria:

1. Maintenance Standards

Criteria: The Program techniques support general and recreational park uses as well as, or better, than traditional park maintenance techniques.

Criteria: The Program will be considered successful when the three designated pesticide free parks have been managed without the use of pesticides for three years.

2. Volunteer Involvement

Criteria: Program has sustained volunteer involvement.

Criteria: This volunteer effort is community based and replicable by PP&R staff.

3. User Group Support

Criteria: The Pesticide Free Parks is supported by neighbors and the community.

Criteria: Program meets the needs of the baseball users groups.

4. Funding

Criteria: Continuing the program after the three year trial is financially feasible, given program costs and benefits and bureau priorities.

PESTICIDE FREE PARKS TRIAL TIME LINE

- Fall 2004 Designation of trial parks for pesticide free management.
- 11/02/04 First work party. Occurred the first weekend each month from that point with some exceptions.
- Apr 2005 Quarterly walk through / Maintenance review at all parks.
- Jul 2005 Quarterly walk through / Maintenance review at all parks.
- Oct 2005 First PFP celebration at all three parks. These were created to highlight the contributions of the volunteers in maintaining the parks, raise awareness about the program, and enlist potential future volunteers.
- Oct 2005 Quarterly walk through and Maintenance review. Lair Hill and Arbor Lodge Parks
- Nov 2005 Quarterly walk through and Maintenance review. Sewallcrest Park
- Dec 2005 First year report. Summary of costs volunteer hours and park condition after the first year.
- Jan 2006 PFP Program coordinator position changed from Allison Parker to Tom Henn.
- Feb 2006 Quarterly walk through / Maintenance review at all parks.
- Apr 2006 Each park has a large (4'x 4'x 8') storage box, fabricated by PP&R welding and carpentry shops, that are used to house volunteer work party tools and equipment. These units eliminated the need for regular tool delivery and pick up for each work party by PP&R staff.
- Jun 2006 Memorandum of Understanding was completed and signed outlining, partner responsibilities, program goals, evaluation criteria, maintenance standards and volunteer coordination.
- Jul 2006 PFP Program coordinator position changed from Tom Henn to Steve Morgan.
- Jul 2006 Quarterly walk through / Maintenance review at all parks.
- Sep 2006 PFP signage and brochure holders were created and installed at each park. Cost \$2,408.
- Oct 2006 PFP celebration. Second celebration followed same format as the first.
- Jan 2007 PFP Program coordinator position changed from Steve Morgan to Martin Nicholson.
- Jan 2007 Second year report. Summary of costs, volunteer hours and park condition after the 2nd year.
- Feb 2007 2nd year review meeting. All involved parties were invited to give input up to the 2 year point, including Parks Management, Key Volunteers, Program Coordinators, and Parks Maintenance Staff.
- Feb 2007 Quarterly walk through / Maintenance review at all parks.
- May 2007 Quarterly walk through / Maintenance review at all parks.
- Fall 2007 3 year trial final evaluation summary and report.

Formal designated work parties were ongoing during the 3 years. From October 2005 through August 2007 there were 21 volunteer work parties at Lair Hill Park, 31 at Sewallcrest Park, and 42 at Arbor Lodge Park.

Personnel and Volunteers

PAID POSITIONS

Volunteer Coordinator: Megan Kemple, staff member for Northwest Coalition for Alternatives to Pesticides, recruited, assisted with the training and supervision of key volunteers, participated in monthly work parties, carried out community outreach, publicized the program, notified volunteers of upcoming work parties and attended quarterly park walk throughs. The role of this position to recruit volunteers was crucial. Megan made contact with groups repeatedly to be sure we would have turn out for work parties. In some cases when Key Volunteers were not able to be present Megan would fill in for them. This position was filled by a paid employee of NCAP and as such Portland Parks has no input in to how long this position will be paid for. NCAP plans to continue the position into the future.

Program Coordinator: Several PP&R horticulturists coordinated the trial program over the three years due to staff position changes. Allison Parker worked on the PFP trial during the start-up phase, Tom Henn and Steve Morgan worked for several months each during year two, and currently Martin Nicholson fills the coordinator role (since January 2007). Duties include infrastructure issues, materials orders and scheduling, providing feed back to the public and Parks management on the program. Program coordination was time consuming during establishment of the PFP trial. As with any new program there were agreements to be drawn up and decisions to make on what form PFP would take. As the trial period progressed there was a reduction in the amount of time it took to manage the program. The final year of the project is likely representative of the amount of time three pesticide free parks would take to manage over the long term. This position was only a part of a Horticulturist's job responsibilities thus the time available fluctuated as other duties increased or became more urgent. The program coordinator was the "go to" person for any unusual occurrences at the parks, the planning of any events connected with PFP and to ensure parks were maintained at the required level.

THE VOLUNTEERS

Key Volunteer: A vital part of the program are the key volunteers at each park who have proven to be reliable and committed to the program. These key volunteers, supervise the work parties, and notify PP&R of equipment, supplies and material needs. They also complete and forward required volunteer paperwork and attend a quarterly

maintenance “walk through” evaluations with PP&R staff. The Key volunteers get additional training on the PP&R volunteer forms and safety of volunteers during park activities.

These positions are so important to the success of the overall program that selection and replacement of these people is time consuming and problematic in itself. At Lair Hill Park there have been three key volunteers. This has caused some program disruption at this site, and Megan has covered the duties of the Key Volunteer at several weekend work parties. That we are able to find one person and have them stick with the program, as the Key Volunteer is a high expectation. In fact, a 2-3 year commitment is likely the best that can be expected. In some cases a long term person may be found whose commitment to the cause and schedule allow them to occupy the Key Volunteer position for an extended amount of time. Whenever this person changes, however, there is an increase in the amount of time spent by both the volunteer coordinator and the program coordinator. Also, if a volunteer to fill the position is not immediately available this position may have to be filled by either of the coordinators until a suitable person is available.

Over the course of the trial program, there has been one Key Volunteer at Arbor Lodge Park, one Key Volunteer at Sewallcrest Park, and there have been 4 key volunteers at Lair Hill Park (currently the principal at the adjacent Waldorf School and an NCAP member).

The qualities that are important in the Key Volunteer are the same that is looked for in a great employee. A commitment to the goal of the program is most essential. When you are asking someone to give up one Saturday morning a month to supervise the work party and submitting paperwork after the work party they must feel that the work they are doing corresponds with their belief and priority system on some level. The person must be able to prioritize the work at hand and delegate the duties to the volunteers who show up on the day. The key volunteers must be willing to have a background check done. They must be open, reliable and trustworthy. It cannot be stressed enough how the key volunteers are essential to the success of the trial program management. It also demonstrates how sensitive this management program is to the availability or lack of volunteers to do the work.

Work Party Volunteers: The volunteers that come to the work party events have been a mixed group. Many have attended only one work party but a few are consistent attendees who work on their part of the park diligently. One volunteer is selected at each park who has attended several workdays to receive additional training in operation of the flame weeder (see Flame weeding below). At all of the parks the percentage

Program Overview

of people attending only one work party was 67% to 72%. This was in part due to large groups attending one work party and not attending again. At Arbor Lodge Park, University of Portland students have attended work parties in the fall to help mulch. Only a few of these students have come back to additional work parties but each year a new group is available in the fall to work one day. The number of volunteers who attend more than 5 work parties are 3-5% and this includes the Key Volunteer who is at most of the work parties. 13 people volunteered at multiple parks. Additional information is given below with specifics on the volunteers at each park and their total contribution.

VOLUNTEER OUTREACH

The volunteer coordinator and key volunteers have coordinated and directed groups of church, University and secondary school volunteers in park maintenance. An outreach program, *Pesticide Free Parks Celebrations*, has been held each year at each of the parks, marking and publicizing the Pesticide Free Parks program in the park neighborhood. Volunteer work parties are publicized in PP&R's volunteer newsletter, the Portland Metro Green Scene, and the Portland Tribune calendar. A June story in the Portland Tribune highlighted the Pesticide Free Parks program. The PP&R website provides information on volunteer opportunities. Megan Kemple also has recruited volunteers at many community events over the last 2.5 years. Volunteers listed the following as sources of information about the PFP program.

Natural Style Festival	NCAP
Parks and Neighborhood	PCC Volunteer program
Salmon Festival	Volunteermatch
Earth Day	Cedarwood School
Portland Home Show	PP&R Web site
Greener Homes and Gardens	Neighborhood association meetings

Trial Parks Information and Management Narrative



Lair Hill Park

SW 2nd Ave. & Woods St.

Acreage: 3.24

Amenities: Includes disabled access play area, paths – paved, picnic tables, playground, statue or public art, tennis court – outdoor, and wading pool or water play feature. 12,990 ft² in shrub beds, of this 6,630 ft² is ivy beds.

LAIR HILL PARK PFP TRIAL VOLUNTEER EFFORT

Lair Hill Park has seen a variable turn out of volunteers and has had three different key volunteers over the trial period where the other trial parks have only had two. The park's relationship with Cedarwood School has not been as solid as was hoped, however the new Key Volunteer arrangement may remedy that situation. Cedarwood School is a Montessori School, which is adjacent to the park. Many of the work parties were arranged to take advantage of the relationship with the school. The children who attend Cedarwood use the park as their daily playground and there are members of the school staff that support the trial designation.

The previous Key Volunteer arranged work parties to take place directly after school when parents and kids could stay for a short time and weed. This proved to be more effective than expecting people associated with the school to return for a Saturday work party. Areas outside of the park fence are maintained by community volunteers instead of students due primarily to safety concerns raised by having children working near the road. There are a few dedicated volunteers who have chosen areas of the park to work in consistently. Currently there are two Key Volunteers. One organizes community work parties on the weekend and one acts as an administrator to coordinate the school's maintenance effort. As of May 2007, there is also a flame weeder trained volunteer. For Lair Hill Park to be kept at an acceptable level of maintenance these positions will be very important as there have been lapses in the volunteer numbers at key times of the year and high weed levels did generate some comments from the zone maintenance supervisor. The Program Coordinator needed to intervene and carry out some weed removal and the rest was taken care of at the following work party. This lapse occurred due to a lack of volunteers to remove weeds at a key time and the weeds became a visual nuisance.



Lair Hill Park

Trial Parks Information and Management Narrative

Volunteer hours at Lair Hill Park have fluctuated over the course of the three year trial. Initially turnout was low before peaking at 60 hours at one work party. The next year the peak was 40 hours and in 2007 the most attended work party was 12 hours. The average hours per work party was 15.3 hours over 21 work parties with a total of 322 hours put in by volunteers from October 2005 to August 2007. This is 33.1 hours per year per acre of park area. The work parties are always put on hold for the mid-winter months due to bad weather and very little weed growth. Numbers peaked in the late spring than decreased through the summer in all years, this is due in part to the school volunteers only being available during the academic year. The last two work parties in 2007 have produced 10 and 12 person hours. Even at this low level the park is in acceptable condition. Weeds are present but not out of control and there have been no complaints or concerns from citizens or parks maintenance staff.

There has been minimal use of mulch at the park and there is potential to expand the amount used. The use of the flame weeding tool at Lair Hill Park has also been limited due to not having a volunteer willing to take on the task. Lair Hill Park was the site of a volunteer-based demonstration project where native plants were planted into some shrub beds. The partners hoped that establishment of native vegetation in these areas would reduce weed growth through competition. Establishment of these plants can be problematic and unfortunately there was not enough watering through the establishment phase and the plantings almost all died during the following summer.



Lair Hill Park playground

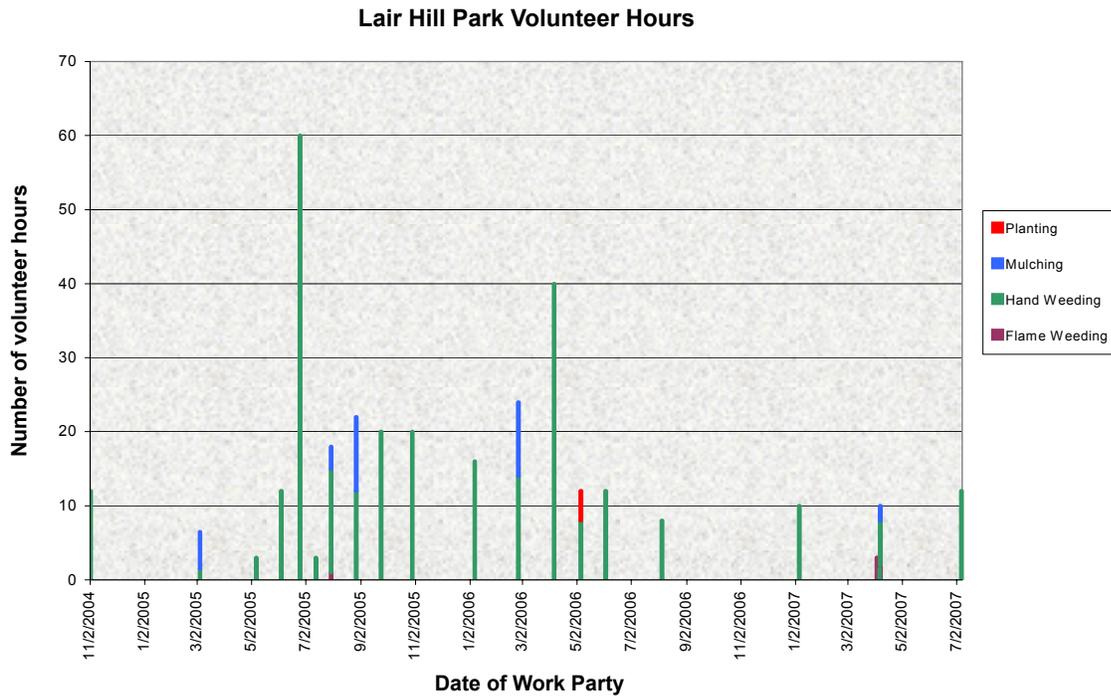


Figure 1. Volunteer hours at Lair Hill Park over the course of the PFP trial showing activity and time spent on that activity.

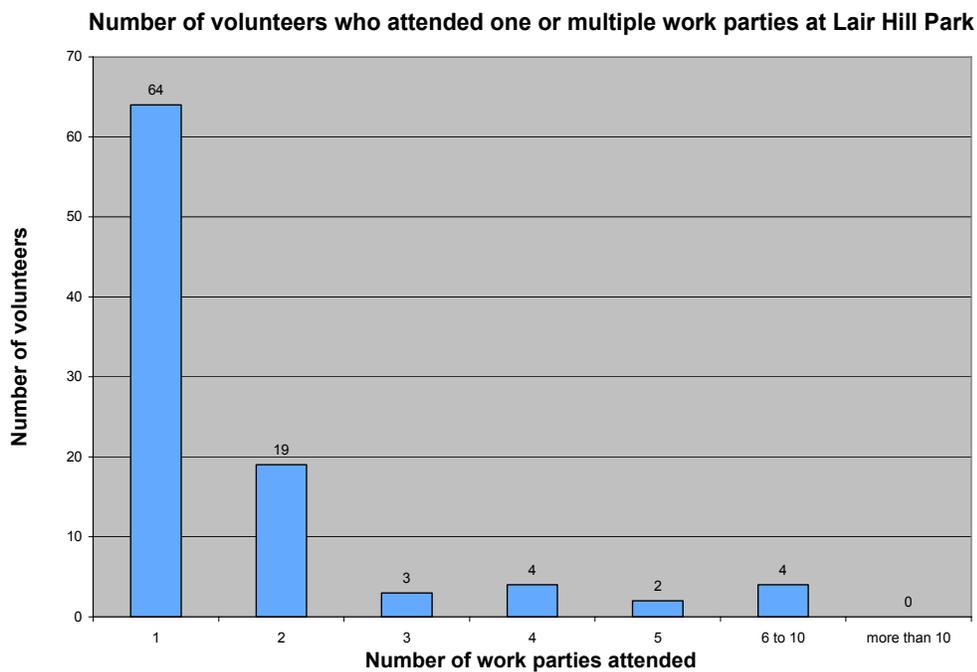


Figure 2. The number of Volunteers who attended one or multiple work parties at Lair Hill Park from October 2004 through August 2007.

Trial Parks Information and Management Narrative

There were 96 individual adults who volunteered at Lair Hill Park over the 3 year trial period. (Information about the number of children involved is not available.) 36 were either Cedarwood parents or lived within 2 miles of the park. 8 lived 2 to 5 miles from the park and 7 lived more than 5 miles from the park. 45 people did not give their zip code. 96 individuals came to the park to volunteer of those 64 did not return, 19 came for two work parties and 13 came for more than two. Repeat volunteers were not plentiful and many times an effort was made to have large turn out at one work party per year to cleanup weeds and take care of areas not previously attended to. Tracking of work parties was not consistent. In particular, week day work parties organized through Cedarwood School were not tracked to show the number of volunteers or hours worked by volunteers; however, work parties at Lair Hill Park that took place during the weekends were tracked.

PESTICIDE USE AT LAIR HILL PARK PRIOR TO TRIAL

Management of this park prior to the PFP trial utilized the current PP&R Integrated Pest Management (IPM) program methods and materials. IPM uses many strategies to achieve goals, combining cultural, physical, biological and pesticidal methods in a holistic, informed, and environmentally sensitive manner. As was typical for a neighborhood park, no insecticides or other highly toxic substances were used, and only a small quantity of low toxicity, biodegradable herbicides were typically applied when needed to shrub beds, tree circles and fence lines. All use of herbicides by PP&R in parks is strictly controlled and administered by the IPM program and its policies. Only state licensed applicators following IPM guidelines are allowed to apply herbicides. Products used are chosen only from a carefully screened and pre-approved list. Health, safety and environmental issues are thoroughly addressed before approval is given. Additionally, PP&R policy states herbicides will not be used to control vegetation in chipped children's play areas or their margins. Notification signage and written record keeping is required for all park applications.

Trial Parks Information and Management Narrative

Pesticide use at Lair Hill Park in the three years prior to being designated pesticide free

Year	Number of Applications	Date of Application	Time to Apply	Product and Amount Used
2004	1 application	6/22	3hrs	60oz Roundup Pro 60oz Surflan AS 3oz Gallery 75DF
2003	2 applications	2/24 5/2	90min 45min	40lb XL 2G pre emergent 2oz Roundup pro 3oz Surflan pre emergent
2002	1 application	2/19	90min	24# Casaron* pre emergent 19# XL2G pre emergent

*Casaron has been replaced by other products and is no longer used in Portland parks.

Cost of pesticide use at Lair Hill Park over the three years prior to being designated pesticide free

Year	Material Cost	Labor to Apply	Labor to Travel / Prep	Total
2004	\$58.43	\$98.82	\$197.64	\$354.89
2003	\$33.31	\$74.12	\$148.23	\$255.66
2002	\$51.73	\$49.41	\$98.82	\$199.86

Travel / preparation cost was calculated by doubling the time to apply. This figure covers training of applicators, equipment maintenance, cleanup and travel to and from site.

*Lair Hill Park
shrub bed*



Trial Parks Information and Management Narrative

Pesticide Free Parks Trial Expenses for Lair Hill Park

October 1st 2004 through June 30th, 2005

Lair Hill Park zone maintenance labor	=	\$86.74
Lair Hill Park Program Coordinator labor	=	\$345.87
General work order covering the program (all 3 parks) 80% start-up costs:		
Parts and Materials	\$1,816.39	
Program Coordinator Labor	+ \$14,781.83 = Total \$16,598.22 / 3 parks	= \$5,532.74 / park
Pesticide Free Park Sign	\$457.31 plus parts \$288.54	= \$745.85
	Total Lair Hill Park 2004/05	\$6,711.20

July 1st 2005 through June 30th, 2006

Start-up work order covering the program (all 3 parks):		
Start-up Parts	\$563.15	
Start-up Program Coordinator labor	+ \$3,700.53 = Total \$4,263.68 / 3 parks	= \$1,421 / park
General work order covering the program (all 3 parks):		
General, Program Coordinator labor	\$10,270.36	
Parts	+ \$366.23 = Total \$10,637 / 3 parks	= \$3,545.67 / park
Lair Hill Park Program Coordinator labor	\$623.42	
Lair Hill Park parts	+ \$22.82	= \$646.24
Zone maintenance staff labor		= \$467.06
	Total Lair Hill Park 2005/06	\$6,079.97

Storage Boxes

Each park had a tool storage box constructed to cut down on the time involved in moving tools.

Toolbox construction labor and parts, padlock and delivery to the park	=	\$2,588
Tools	=	\$230
	Total toolbox and tools	\$2,818

July 1st 2006 through June 30th, 2007

General work order covering the program (all 3 parks):		
General	\$125.40 parts	
General Program Coordinator labor	+ \$8,114.77 = Total \$8,240.17 / 3 parks	= \$2,746.72 / park
Lair Hill Park Program Coordinator labor	\$,2288.09 + \$93.84 parts	= \$2,381.93
Mulch		= \$89.08
Zone maintenance staff labor		= \$139.65
	Total Lair Hill Park 2006/07	\$5,357.38

Pesticide Free Parks Trial Expenses for Lair Hill Park *continued*

Grand total for three years. \$20,966.55 / 3 years = \$6,988.85 per year.

Start-up Costs

Start-up costs Parts and Labor = \$5,847 total

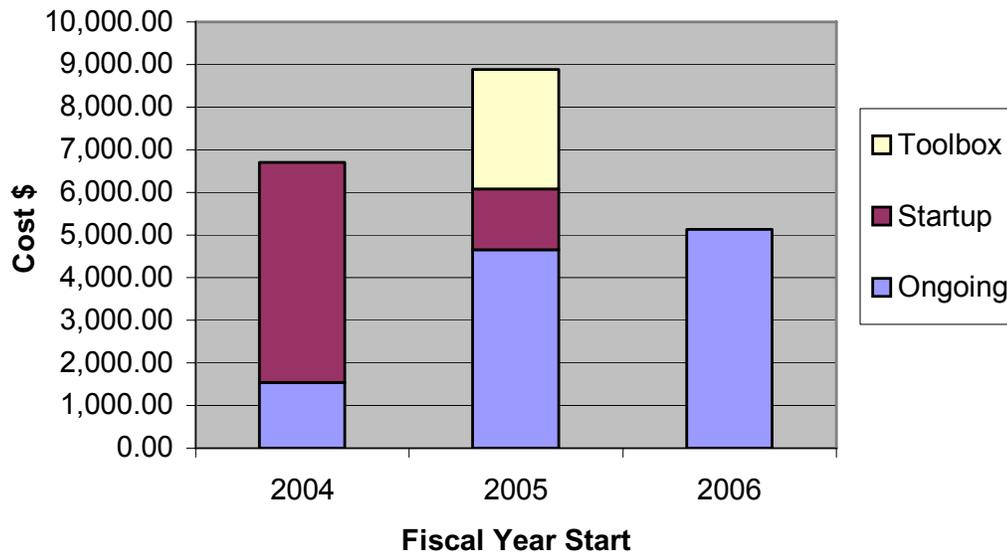
Toolbox and Signs = \$3,553.85 total

Total Start-up Costs = \$9,400.85

Per year costs adjusted for Start-up Expenses

\$20,966.55 - \$9,400.85 = \$11,565.70 / 3 years = \$3,855.23 / year

PFP Program Cost at Lair Hill Park over the Three Year Trial Period



Sewallcrest Park

SE 31st Ave. & Market St.

Acreage: 5.09

Amenities: Includes basketball court – outdoor, disabled access play area, dog off-leash area, paths – paved, picnic tables, playground, soccer field, and softball field. 150 ft² of shrub beds.

SEWALLCREST PARK PFP TRIAL VOLUNTEER EFFORT

Sewallcrest Park is a small neighborhood park with one heavily used ball field. The park has only a few problem areas that need constant attention mainly in the form of overgrown fence lines. We have been very fortunate in having a Key Volunteer who is committed to making the program successful. There is a regular group of volunteers averaging 3-6 in number at each work party and they are able to keep up with the weeds.

The volunteer hours over the three years follow a similar pattern at the other sites peaking in the first six months before declining to a consistent level of about 10-12 hours per work party. At Sewallcrest Park the work parties are once per month in the light weed months but through the spring twice per month helped to maintain the park at a high level. Sewallcrest Park is a very well maintained park thanks to the consistent efforts of the Key Volunteer and the other dedicated volunteers who take their task of maintaining the park very seriously.



Of the three trial parks, Sewallcrest Park has been maintained the best, the ball field being the only area that initially seemed would cause some problems. The use of the flame weeder as opposed to hula hoes on the ball field was the break through that was required to make this a manageable feature at the park. As mentioned above this ball field is heavily used and throughout the trial there was no additional work required from the ballfields maintenance crew or from the little league to keep this a playable field. The total number of volunteer hours over the trial period from October 2005 to August 2007 was 348.5 hours. This is 22.8 hours per year per acre of park area.

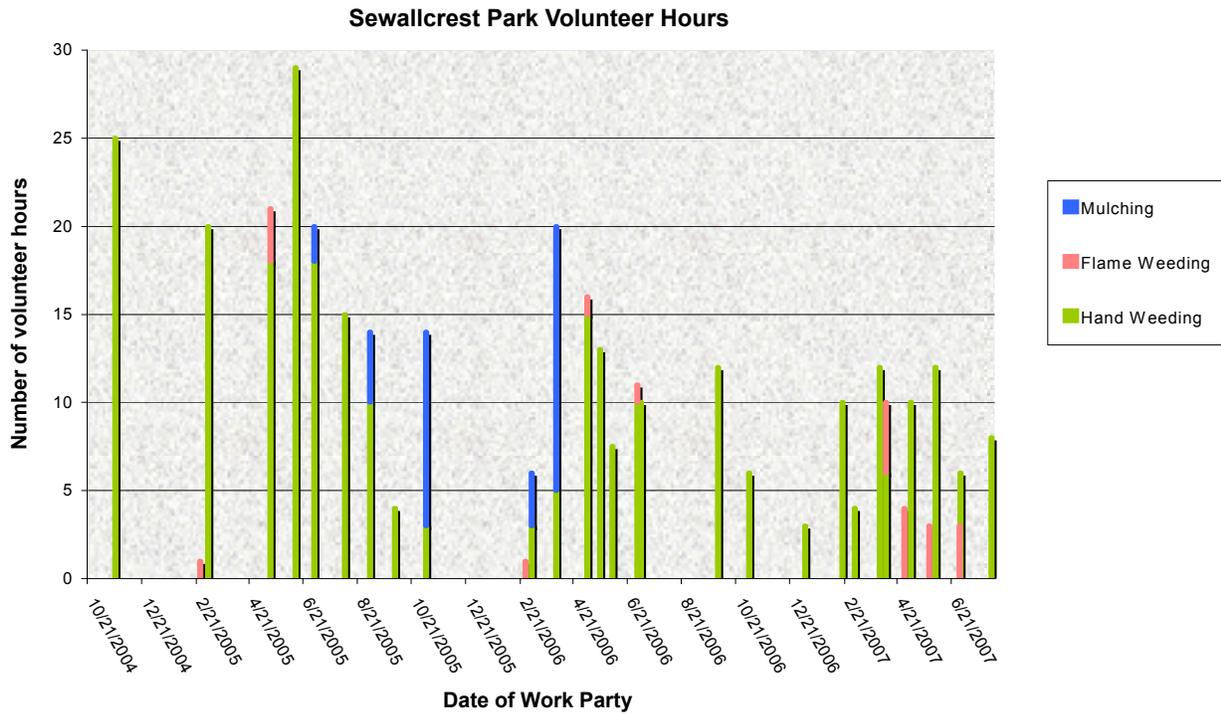


Figure 3. Volunteer hours at Sewallcrest Park over the course of the PFP trial showing activity and time spent on that activity

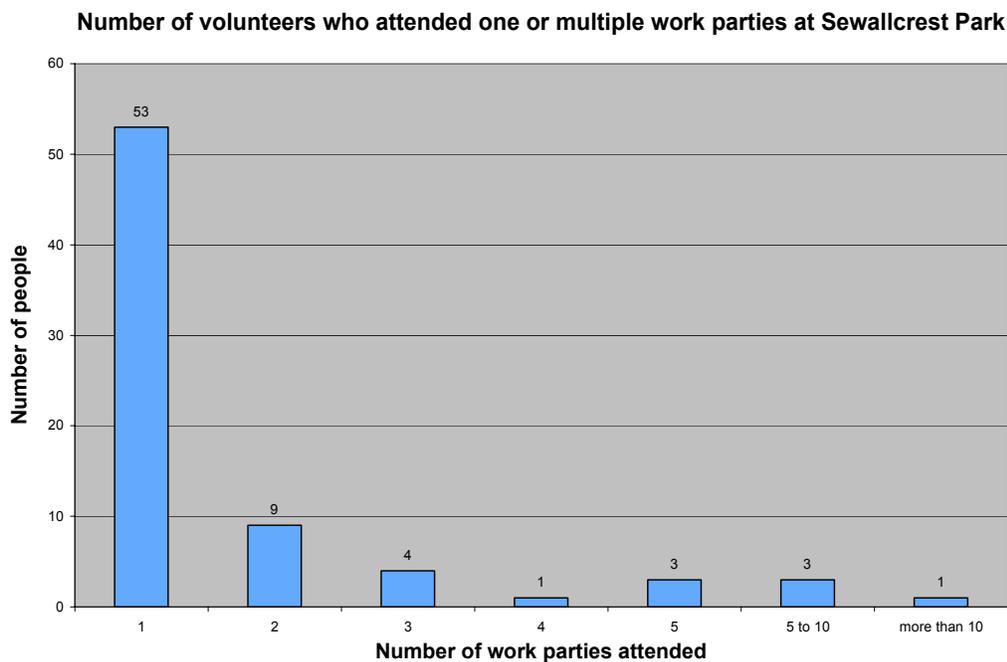


Figure 4. Number of volunteers who came to one or multiple work parties at Sewallcrest Park over the 3 years of the Trial PFP program.

Trial Parks Information and Management Narrative

According to Volunteer reports turned in by the Key Volunteer after each work party there were 74 individuals who volunteered at the park, of these 53 (72%) only attended one work party. 9 (12%) attended 2 and 12 (16%) attended more than 2 of those though only 4 attended more than 5 work parties. At Sewallcrest Park 69% of the volunteers traveled less than 2 miles to the park 9.5% 2-5 miles and 13% over 5 miles. 9.5% did not give a zip code or address.

PESTICIDE USE AT SEWALLCREST PARK PRIOR TO TRIAL

Management of this park prior to the PFP trial utilized the current PP&R Integrated Pest Management (IPM) program methods and materials. IPM uses many strategies to achieve goals, combining cultural, physical, biological and pesticidal methods in a holistic, informed, and environmentally sensitive manner. As was typical for a neighborhood park, no insecticides or other highly toxic substances were used, and only a small quantity of low toxicity, biodegradable herbicides were typically applied when needed to shrub beds, tree circles and fence lines. All use of herbicides by PP&R in parks is strictly controlled and administered by the IPM program and its policies. Only state licensed applicators following IPM guidelines are allowed to apply herbicides. Products used are chosen only from a carefully screened and pre-approved list. Health, safety and environmental issues are thoroughly addressed before approval is given. Additionally, PP&R policy states herbicides will not be used to control vegetation in chipped children's play areas or their margins. Notification signage and written record keeping is required for all park applications.

Pesticide use in the three years prior to the pesticide free designation consisted of the herbicide Roundup Pro totaling 58oz of concentrated product.

Pesticide use at Sewallcrest Park in the three years prior to being designated pesticide free

Year	Number of Applications	Date	Time to Apply	Product and Amount Applied
2004	3 applications	6/3 7/6 8/2	3hrs 25min 10min	21oz Roundup Pro, general park 12oz Roundup Pro, ball field only 2oz Roundup Pro, ball field only
2003	2 applications	5/25 8/31	30min 20min	3oz Roundup Pro, ball field only 8oz Roundup Pro, ball field only
2002	2 application	3/29 9/05	140min 30min	6oz Roundup Pro 6oz Roundup Pro, ball field only

Cost of pesticide use at Sewallcrest Park in the three years prior to being designated pesticide free

Year	Material Cost	Labor to Apply	Labor to Travel / Prep	Total
2004	\$6.30	\$115.29	\$230.58	\$352.17
2003	\$1.98	\$32.94	\$65.88	\$100.80
2002	\$2.16	\$98.82	\$197.64	\$298.80



Sewallcrest Park sport field

Trial Parks Information and Management Narrative

Pesticide Free Parks Trial Expenses for Sewallcrest Park

October 1st 2004 through June 30th, 2005

Sewallcrest Park zone maintenance labor	=	\$334.98
Sewallcrest Park Program Coordinator labor	=	\$0
General work order covering the program (all 3 parks) 80% Start-up costs:		
Parts and materials	\$1,816.39	
Program Coordinator Labor	+ \$14,781.83 = Total \$16,598.22 / 3 parks	= \$5,532.74 / park
Pesticide Free Park sign	=	\$698.52
	Total Sewallcrest Park 2004/05	\$6,566.24

July 1st 2005 through June 30th, 2006

Start-up work order covering the program (all 3 parks):		
Start-up Parts	\$563.15	
Program Coordinator labor	+ \$3,700.53 = Total \$4,263.68 / 3 parks	= \$1,421 / park
General work order covering the program (all 3 parks):		
General, parts	\$366.23	
Labor	+ \$10,270.36 = Total \$10,637 / 3 parks	= \$3,545.66 / park
Program Coordinator labor	=	\$645.24
Zone maintenance staff labor	=	\$0
	Total Sewallcrest Park 2005/06	\$5,611.90

Storage Boxes

Each park had a storage box constructed to cut down on the time involved in moving tools around for the work parties.

Toolbox construction labor and parts, padlock, and delivery to the park	=	\$2,427.01
Tools	=	\$230
	Total toolbox and tools	\$2,657

July 1st 2006 through June 30th, 2007

General	\$8,114.77 labor + \$125.40 parts total \$8,240 / 3 park	= \$2,747 / park
Program Coordinator labor	\$596.50 + parts \$121.88	= \$718.38
Zone maintenance staff labor	=	\$297.22
	Total Sewallcrest Park 2006/07	\$3,762.60

Pesticide Free Parks Trial Expenses for Sewallcrest Park

Grand total for three years. \$18,597 / 3 years = \$6,199 per year.

Start-up Costs

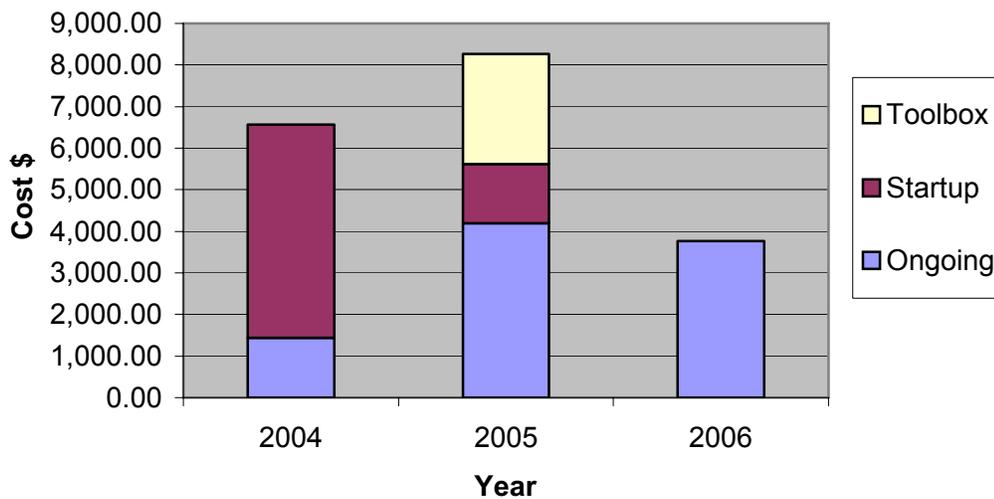
Start-up Labor and Parts = \$5,847.19

Sign and Toolbox = \$3,355.52

Start-up Total = \$9,202.71

Per year cost adjusted for Start-up Expenses = \$3,121.43 per year

PFP Program Cost at Sewallcrest Park over the Three Year Trial Period



Arbor Lodge Park

N Bryant St. & Delaware Ave.

Acreage: 8.40

Amenities: Includes disabled access play area, disabled access restroom, dog off-leash area, horseshoe pit, paths – paved, picnic tables, playground, soccer field, softball field, statue or public art, tennis court – outdoor, and wading pool or water play feature. 2,230 ft² of shrub bed, 1,920 ft² of this is in a hedgerow 310 ft² in mixed shrubs.

ARBOR LODGE PARK PFP TRIAL VOLUNTEER EFFORT

Arbor Lodge Park is the largest of the three trial parks and has required the largest volunteer crew to maintain it. As with the other two parks, the beginning volunteer work force was large. The initial group was an Americorp work group. The Americorp crew attended two of the early workdays putting in 60 hours at two December work parties. They are paid a stipend for the work they do though not from the PFP program. The funding comes directly from the government. The coordinator for the group contacted Megan about working at the site and they were available only for two work parties. At one work party the 60 hours were spent on the ballfields only. It was at this stage that the ballfields appeared they would be too problematic to maintain with the volunteers alone. Soon after that, the flame weeder was introduced and used heavily through the first year. The flame weeder continues to be used extensively and frequently at Arbor Lodge Park, the main area

being hit is the ball field and the gravel parking lot on the East Side of the park. The cracks in the sidewalks also benefit from being flame weeded but it must be repeated on short rotations if weeds are to be eradicated from the cracks. Currently it just maintains them as smaller plants.

The amount of mulching done at Arbor Lodge Park has increased since the start of the trial period. Tree rings, light poles, signs, and shrub beds are all mulched now. Some areas have received mulch twice during the 3 years though most have received a



first application in 2007 only. Forestry chips are used as the mulch. This is a coarsely chopped product produced by the wood chipper PP&R Urban Forestry unit uses when clearing fallen trees or removed branches. The mulching work parties are planned when a large volunteer group is available, as these are labor intensive days. Most recently 20 yards of mulch was spread by 30 University of Portland students plus some of the regular volunteers.

Arbor Lodge Park has struggled with low numbers of neighborhood volunteers, though park maintenance standards have been met. A couple who has been in the role since October 2004 shares the Key Volunteer duties at Arbor Lodge Park. Although they do not live in the neighborhood they are long time NCAP members and committed to the success of the program. Three different people have been responsible for flame weeding the park and the current flame weeder lives two blocks from the park and walks to the park to flame weed.

Volunteer hours required to keep up with the maintenance seem to be about 20 hours per month with the addition of one or two large work parties for mulching and weeding areas not cleaned up at the main work parties. Flame weeding is also essential here as the ball fields being treated 2 times per month in the spring and occasionally during the winter plus gravel areas and sidewalk cracks. The total number of volunteer hours over the trial period from October 2005 to August 2007 was 703.5 hours. This is 27.9 hours per year per acre of park area.

Of the volunteers we have information for, 45 of the 98 did not indicate how far from the park they lived. Of the remaining 53, 31 traveled less than 2 miles, 12 2-5 miles, and 10 more than 5 miles. Feed back from the walk throughs has generally been positive about how the park has been maintained, the only concern raised being the extent of neighborhood involvement and what the neighborhood PFP support level is. Though this is a well used park there is no indication that there is more or less use with the pesticide free designation. The turf areas at the park were aerated and over seeded, as per the IPM program recommendations this spring, then fertilized and mowed regularly to maintain the turf in excellent condition.



Trial Parks Information and Management Narrative

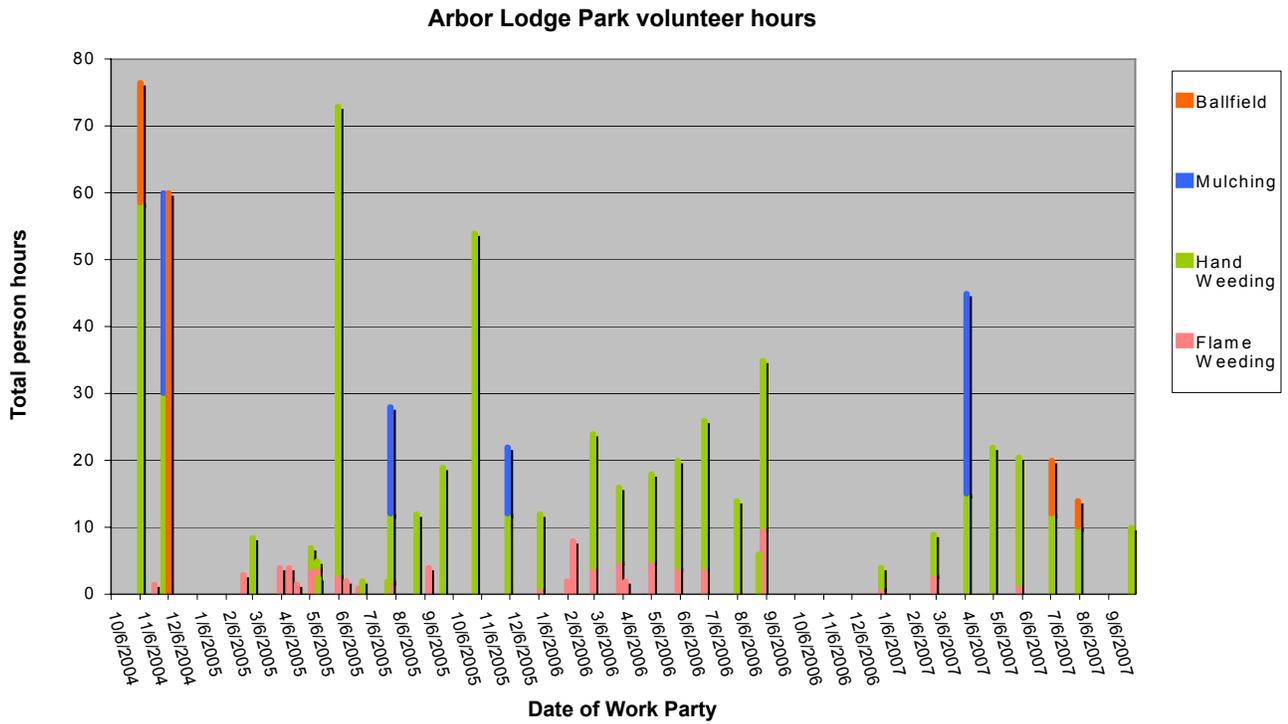


Figure 5. Volunteer hours from October 2004 to August 2007 at Arbor Lodge Park

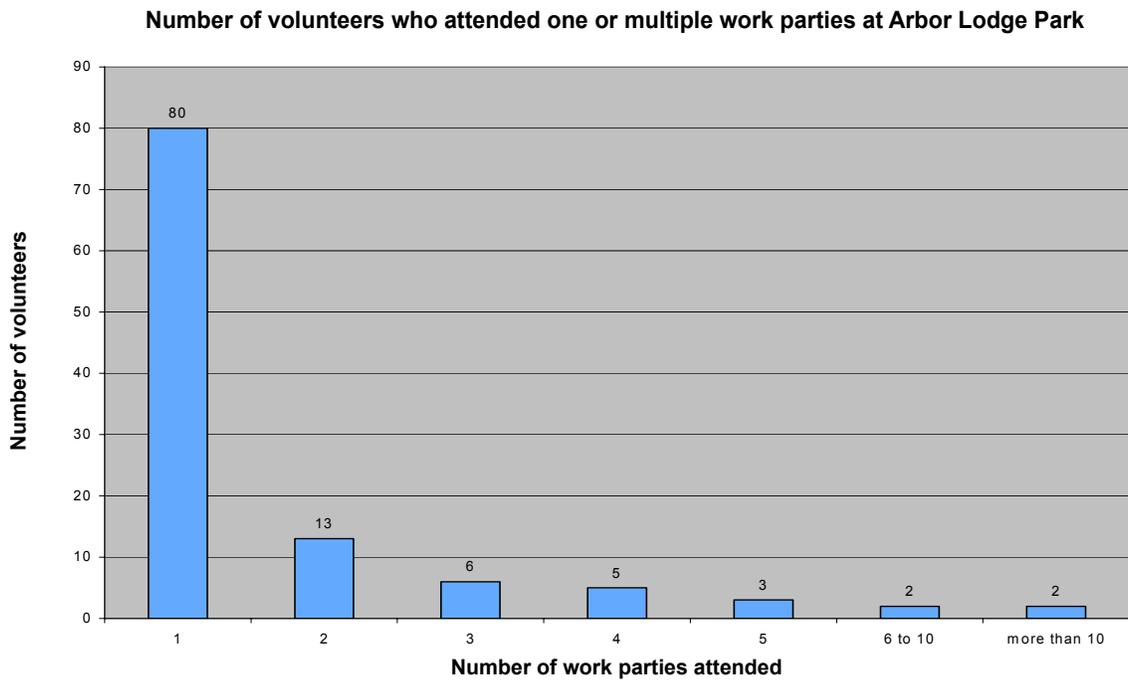


Figure 6. Number of volunteers who attended one or multiple work parties at Arbor Lodge Park

PESTICIDE USE AT ARBOR LODGE PARK PRIOR TO TRIAL

Management of this park prior to the PFP trial utilized the current PP&R Integrated Pest Management (IPM) program methods and materials. IPM uses many strategies to achieve goals, combining cultural, physical, biological and pesticidal methods in a holistic, informed, and environmentally sensitive manner. As was typical for a neighborhood park, no insecticides or other highly toxic substances were used, and only a small quantity of low toxicity, biodegradable herbicides were typically applied when needed to shrub beds, tree circles and fence lines. All use of herbicides by PP&R in parks is strictly controlled and administered by the IPM program and its policies. Only state licensed applicators following IPM guidelines are allowed to apply herbicides. Products used are chosen only from a carefully screened and pre-approved list. Health, safety and environmental issues are thoroughly addressed before approval is given. Additionally, PP&R policy states herbicides will not be used to control vegetation in chipped children’s play areas or their margins. Notification signage and written record keeping is required for all park applications.

Pesticide use at Arbor Lodge Park in the three years prior to being pesticide free

Year	Number of Applications	Date	Time to Apply	Amount and Product Applied
2004	9	3/23	1hr	13oz Roundup Pro Ball field
		3/22	2.5hrs	14oz Roundup Pro Tree rings side walks, pole bases
		3/22	30min	6oz Roundup Pro Ball field
		4/23	1hr	3oz Roundup Pro Shrub bed
		4/26	45min	8oz Roundup Pro Tree rings, light poles
		6/11	15min	1oz Roundup Pro Cracks in concrete
		7/11	30min	5oz Roundup Pro Curbs benches sidewalk
		8/09	45min	6oz Roundup Pro Tree rings
		9/25	40min	8oz Roundup Pro Sidewalk backstops trees
2003	5	9/17	30min	8oz Roundup Pro Soccer field lines
		9/30	45min	5oz Roundup Pro Shrub bed
		9/3	18min	8oz Roundup Pro Ball field
		7/31	45min	5oz Roundup Pro Sidewalks
		4/9	1.5hrs	6oz Roundup Pro Shrub bed
2002	3	Aug	45min	12oz Roundup Pro Soccer field lines
		3/30	4hr	27oz Roundup Pro General Park
		3/31	1hr	6oz Roundup Pro General Park

Cost of pesticide use at Arbor Lodge Park in the three years prior to being pesticide free

Year	Material Cost	Labor to Apply	Travel / Prep	Total
2004	\$11.52	\$263.52	\$527.04	\$802.08
2003	\$5.76	\$131.76	\$263.52	\$401.04
2002	\$8.10	\$189.41	\$378.81	\$576.32

Trial Parks Information and Management Narrative

Pesticide Free Parks Trial Expenses for Arbor Lodge Park

October 1st 2004 through June 30th, 2005

Parks Zone Maintenance labor	=	\$0
Arbor Lodge Park Program Coordinator labor	=	\$436.46
General work order covering the program (all 3 parks) 80% start-up costs:		
Program Coordinator labor	\$14,781.83	
Parts and Materials	+ \$1,816.39 = total \$16,598.22 / 3 parks	= \$5,532.74 / park
Pesticide Free Park sign	=	\$1,061.94
Mulch 5 yards (delivery cost only)	=	\$81.14
	Total Arbor Lodge Park 2004/05	\$7,112.28

July 1st 2005 through June 30th, 2006 Budget

Start-up work order covering the program (all 3 parks):		
Start-up Parts	\$563.15	
Program Coordinator labor	+ \$3,700.53 = total \$4,263.68 / 3 parks	= \$1,421 / park
General work order covering the program (all 3 parks):		
Parts and Materials	\$366.23	
Program Coordinator Labor	+ \$10,270.36 = total \$10,637 / 3 parks	= \$3,545.66
Arbor Lodge Park Program Coordinator labor	=	\$643.82
Zone maintenance staff labor	=	\$615.67
Arbor Lodge Park mulch, 12 yards	=	\$165.60
Arbor Lodge Park rign repair	=	\$230.27
	Total Arbor Lodge Park 2005/06	\$6,622.02

Storage Boxes

Each park had a storage box constructed to cut down on the time involved in moving tools around for the work parties.

Install box \$163.94 + padlock \$47.62 + construct box \$2411.83	=	\$2,623.39
Tools	=	\$230
	Total toolbox and tools	\$2,853.39

July 1st 2006 through June 30th, 2007

General work order covering the program (all 3 parks):		
Program Coordinator labor	\$8,114.77	
Parts and Materials	+ \$125.40 = total \$8,240 / 3 parks	= \$2,747 / park
Arbor Lodge Park Program Coordinator labor	\$1,456.03	
Arbor Lodge Park parts and materials	+ \$138.07	= \$1,594.10
Zone maintenance staff labor	=	\$139.65
Arbor Lodge Park mulch, 12 yards	=	\$179.35
Gravel	=	\$175.45
	Total Arbor Lodge Park 2006/07	\$4,835.55

Pesticide Free Parks Trial Expenses for Arbor Lodge Park *continued*

Grand total for three years. \$21,423 / 3 years = \$7,141 per year.

Start-up Costs

Start-up Costs Parts and Labor = \$5,847 total

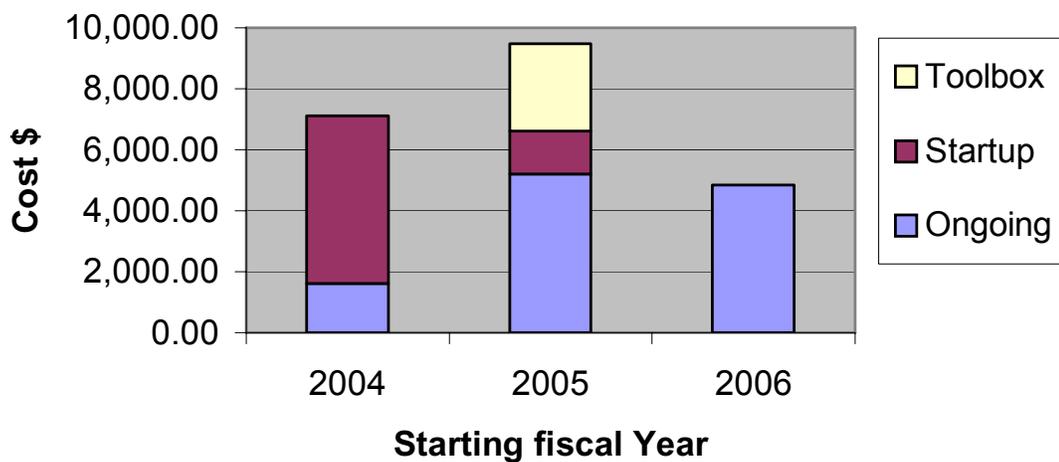
Toolbox and Signs = \$3,915.33 total

Total Start-up costs = \$9,762

Per year costs adjusted for Start-up Expenses

\$21,423 - \$9,762 = \$11,661 / 3 years = \$3,887 / year

PFP Program Cost at Arbor Lodge Park over the Three Year Trial Period





Arbor Lodge Park, N. Bryant St. & Delaware Ave.

Table 1: Summary Comparison of Costs and Inputs

Comparison of average inputs per year for one averaged trial park of 5.6 acres; PFP management model compared to current Portland Parks IPM model.

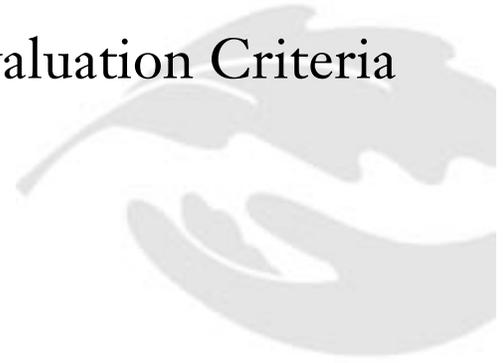
	PFP	IPM
PFP Start-up Cost	\$9,455 (includes signs and toolbox)	
Ongoing PFP Labor Cost	\$3,390	No PFP costs
PFP Parts and Materials Cost	\$230	
Non-PP&R Labor Hours (NCAP etc.)	144 hours per year	0 hours per year
Volunteer Hours Needed	117.8 hours	No volunteer weeding
Herbicide Use: Roundup Pro Other	None used None used	28.8oz per year 6.6oz Surflan, 2lb XL2G
Herbicide Application Labor Cost	\$0	\$371 per year
Herbicide cost	\$0	\$19.92 per year
Total Weed Management Cost	\$3,621 (plus volunteer and NCAP hours: 261.8)	\$370.92 Volunteer hours: 0
Chipped Playground Areas	No pesticides used, no affect on management.	No pesticides used in or near chipped playground areas.
Ballfields	Flame weeded. Dragging and grooming by Ballfield maintenance crew	Roundup application 1 to 2 times per year. Dragging and grooming by Ballfield maintenance crew.
Turf	Turf aerated, over seeded and fertilized. Mowed frequently and at healthy height.	Turf aerated, over seeded and fertilized. Mowed frequently and at healthy height.

Note: Management of trial parks prior to the PFP trial utilized the current PP&R Integrated Pest Management (IPM) program methods and materials. IPM uses many strategies to achieve goals, combining cultural, physical, biological and pesticidal methods in a holistic, informed, and environmentally sensitive manner. As was typical for a neighborhood park, no insecticides or other highly toxic substances were previously used, and only a small quantity of low toxicity, biodegradable herbicides were applied when needed to shrub beds, ballfields, tree circles and fence lines. All use of herbicides by PP&R in parks is strictly controlled and administered by the IPM program and its policies. Only state licensed applicators following IPM guidelines are allowed to apply herbicides. Products used are chosen only from a carefully screened and pre-approved list. Health, safety and environmental issues are thoroughly addressed before approval is given. Additionally, PP&R policy states herbicides are not used to control vegetation in chipped children’s play areas or their margins. Notification signage and written record keeping is required for all park applications.



A furry park resident

Program Goals and Evaluation Criteria



Program goals and evaluation criteria as established in the MOU

MAINTENANCE STANDARDS

Criteria: The Program technique supports general and recreational park uses as well as, or better, than the traditional park maintenance technique?

General and recreational park uses were not significantly affected by the trial management.

Criteria: The Program will be considered successful when the three designated pesticide free parks have been managed without the use of pesticides for three years.

There were pesticides used in the parks twice. Once was accidental and one was a targeted insecticide application. In the first instance, soccer field lines were being marked and the equipment use was still loaded with roundup from the previous park. When the error was discovered the sod was cut and lifted and then remarked without the roundup.

The second instance was to control a stinging insect pest that had nested in the play structure at Sewallcrest Park. The pesticide used was an aerosol can formulation and the application targeted the nest only. This application falls into the group of possible exceptions allowed in the MOU section 6. The pest in question was considered a public health concern.

VOLUNTEER INVOLVEMENT

Criteria: Program has sustained volunteer involvement.

Criteria: This volunteer effort is community based and replicable by PP&R staff.

Determine whether the community actively supports the replacement of pesticide use in selected parks by volunteering on a regular basis to control weeds.

There were 244 volunteers at the three parks and over the 3 years they put in 1374 hours of time. Of the 244 volunteers, 114 came from within 2 miles of the park they volunteered at. 27 came from between 2 and 5 miles from the park and 26 traveled more than

Program Goals and Evaluation Criteria

5 miles to volunteer. 77 people did not give information about where they lived in relation to the park.

At all of the parks the percentage of people attending only one work party was 67% to 72%. This was in part due to large groups attending one work party and not attending again. The number of volunteers who attend more than 5 work parties are 3-5% and this includes the Key Volunteers who are at most of the work parties.

There was a general declining trend in the volunteer hours at Lair Hill Park and less so at Sewallcrest Park. Arbor Lodge Park has held its volunteer numbers at a level which is acceptable for maintenance of the site. Sewallcrest Park has a 2-4 people who have volunteered multiple times.

USER GROUP SUPPORT

Criteria: The Pesticide Free Parks is supported by neighbors and the community.

Unclear if there is more support for the park since it has had PFP status. As long as a park is maintained to adequate standard there is usually little comment from neighbors.

Criteria: Program meets the needs of the baseball users groups.

Have not received feedback from the Ball field users. They have been called for comment. Previous feedback from the ball field users has been positive. The ball fields at the PFP parks appear no different from the ball fields at the other parks.

FINANCIAL IMPACT

Criteria: Determine the financial impact of the program related to program costs and benefits and bureau priorities.

The three-year (2002-04) average weed control cost for a single park by zone maintenance was \$371. This includes preparation, travel time, labor, application and materials.

Pesticide Free Parks Program costs per year averaged over the three parks was \$3,621 including Start-up costs which were \$9,455 per year.

Using the figures from the trial period the budget for a park to be established and maintained as Pesticide Free would be:

Start-up Costs

Tool Storage Box				= \$2,500
Signs				= \$,1000
Tools				= \$500
Wheelbarrows	2	Hand Weeder	9	
Buckets	5	Scoop Shovels	1	
Hand Pruners	1	Dustpan	1	
Square Shovel	1	Trowels	5	
Round Point Shovel	10	Hard Rake	1	
Winged Weeder	3	Push Broom	1	
Leaf Rake	2	First Aid Kit	1	
Hay Forks	2	Hula Hoes	6	
Sharps Container	1	Gloves	10 pairs	
Hoes	2	Garbage Bags	12	

Some things are supplied from stock on hand and some items were donated in the past. The \$500 should cover items that need to be purchased.

Program Coordinator Labor for one park using current forms and procedures. Organize tools, signs, information, train Key Volunteer, train other volunteers and track their involvement. Also walk through of park and developing a maintenance checklist. Identifying priorities and problem areas within the park.

125 hours @ 32.94 / hr = \$4,117.50

Total Start-up Cost = \$8117.50

Ongoing Volunteer Coordination

For one park using existing format.

Quarterly walk through, 1 hour 4 times per year = 4

Occasional work party attendance 4 hours twice per year = 8

Volunteer events 10 hours once per year = 10

Mulch orders' repairs, upkeep on equipment and supplies 40 hours throughout year = 40

Volunteer coordination and tracking. 3 hours monthly = 36

Total Ongoing Cost: 98 hours @ \$32.94 = \$3,228.12

Total 1st year cost \$11,346: Start-up plus ongoing cost

Total 2nd year cost \$3,728.12: 98 hours @ \$32.94 plus \$500 tool replacement and miscellaneous

Program Goals and Evaluation Criteria

This only reflects actual dollar cost to Portland parks. It does not reflect the paid time spent on the program by NCAP's representative in the Partnership. Megan Kemple reported her mid-trial hours in 2006 as follows:

“This past year I spent about 12 hours per month on the Pesticide Free Parks program on average. About 1 hour per week (4 hours per month) on regular ongoing tasks & communication plus an additional 4 hours per month if I attend work parties, walk throughs. Plus about 40 hours a year (about 4 hours per month) on outreach events such as the salmon festival, earth day, and celebrations. So that would be about 12 hours per month. I'm not counting travel time to and from Eugene in this. I expect this number will be lower in the coming year.”

From this, her total hours are 144 hours not including commuting time.

Comparison of Weed Management Costs

Comparison of the annual PFP management cost versus the current PP&R IPM reveals a very wide disparity. Average annual management costs for one trial park was \$3,621, plus start-up costs of \$9,455 with additional volunteer and NCAP coordination hours totaling 261.8 hours. Prior management of the site (IPM) totaled \$371 annually.

Other Intangible Benefits and Costs of the Program

In relating funding to the Bureau goals and priorities it is important to review the Parks mission and the 2020 vision for Portland Parks and Recreation. In the PP&R mission the bureau pledges to “...ensuring green spaces are accessible to all.” The organizational values and parks 2020 vision require that we “provide a wide variety of high quality park and recreation services and opportunities for all residents.” The PFP program creates some niche parks which much like a skate park or basketball court provide a service to a resident who chooses to visit a park at which no pesticides have been applied. Though the cost of maintaining the parks is extremely high in comparison to our current IPM program management, the additional cost could be evaluated in light of our need to serve all members of the community.

The program also works toward another goal of the 2020 vision, engaging residents as stewards of Portland's parks and recreation system to help preserve the legacy for future generations. The addition of this new program also helps towards achieving the goal of increasing the ratio of volunteer hours to paid staff hours. 244 people volunteered at least one day during the three years. It is expected that many of these volunteers have a heightened sense of what it takes to maintain Portland's parks at current service levels. However, it should be also noted that volunteer support is highly valued in other management needs in our parks, and volunteer hours that have been expended in the trial PFP parks may have been applied to other worthy community and PP&R goals.

The program has also expended staff and budgetary resources that would have been available for other work and projects with in PP&R programs. The main resource used is staff labor that is always in short supply, particularly in horticultural support for our parks and natural areas.



Sewallcrest Park sports field

Factors Aiding Volunteer-Weeded Parks



From the three year trial we can draw some conclusions about what makes a park successful if managed through volunteer efforts without the use of herbicides.

Ballfields. These were a large labor sink for the volunteers. In the parks with ballfields it was quickly learned that over half of the volunteer hours were spent on just this park feature. With improved tools and management technique they are now more manageable, but still take much time. The trial park without ballfields is much more straightforward to maintain, although it still requires a large amount of volunteer labor. Parks without ballfield are more suitable for this management approach than those with ballfields.

Shrub Beds. Established shrub beds have a much lower weed burden than newly installed shrub bed areas. IPM techniques such as mulching every 12-18 months to reduce weed buildup should be employed. Hand weeding is the only useful technique available for these sites. There is a high expectation from parks users that shrub beds be fairly weed free. Two of the three parks in the trial had very small shrub bed areas which aided in their management. The third park had well established shrub beds.

Turf Areas. Current IPM practices require turf areas to receive timely and herbicide-free cultural treatment to maintain turf. Overseeding, aeration, and timely irrigation and mowing occurs at all of Portland parks regardless of their specific management regime.

Paved Areas. Cracks in paved areas are a problem for both manual, herbicidal and flame weeding weed control methods. Allowing weeds to get established in cracks reduces the life span of the surface and interferes with park users activities. Pavement cracks should be repaired quickly when repair is possible.

Tree Circles. Tree circles are important to maintain properly to protect our urban forest. It is easier to maintain these circles on younger trees that do not have a lot of surface roots. Congregation of trees into contiguous rows or shrub beds also eases maintenance. With congregated plantings the number of trees can be the same but there are less tree circles to weed. On tree circles without a lot of surface roots mulch can be used but must not be placed more than one inch deep where it contacts the trees trunk. Trees with many surface roots and with a large trunk flare are typically best managed without additional mulch being applied. It is important that these

Factors Aiding Volunteer-Weeded Parks

mulched areas be kept at a regular level since over-mulched sites create problems for mowers and other park users.

Light Poles, Signs, Garbage Bins. At most of the pesticide free parks these features have been mulched around as this reduces the need to hand weed for 6-12 months depending on the depth of the mulch. There is seldom such a great number of these items that they become an obstacle to maintain the parks pesticide free. It is important that these mulched areas be kept at a regular level since over-mulched sites create problems for mowers and other park users.

Natural Areas. None of the selected trial parks had natural areas since in many cases there are invasive weed issues that need to be addressed in a responsible manner. Proper management of these sites requires our entire IPM program toolbox, including the use of herbicides within a carefully prescribed context.

Park Size. Arbor Lodge Park stretches the size limit of manageable pesticide free park methods. The large number of volunteers required for large sites quickly becomes a limiting factor. Also coordination of a large group of volunteers into a cohesive work force is difficult. Assigning more than 20 volunteers per group leader creates problems. Assessing the volunteer hours used at the 8.4 acre Arbor Lodge Park trial park shows that 98 people, putting in 703.5 hours over the 3 years were required. A larger neighborhood park such as the 42 acre Westmoreland park would require over 3,500 hours over three years.

Neighborhood Support. For the pesticide free parks program neighborhood support was an important factor. It was found that people were willing to travel some distance to be involved in the volunteer work at the park. Some volunteers were willing to travel to support the trial program goals and their desire for a park maintained without pesticides. Sources of ready volunteers enhance the support for this park management style, such as adjacent schools, universities or existing volunteer groups.

Post Pesticide Free Parks Trial Management



As the trial period ends, there are several issues to be addressed if the pesticide free status in these three parks is to be successfully maintained. As of October 2007, the three parks are all in good condition. If the current volunteer base is maintained, this level should be maintainable. However, if there is a change in the size of the volunteer base or if the NCAP volunteer position is not maintained or replaced, PP&R should be prepared for a drop in quality. A method to deal with substandard maintenance levels should be in place to deal with this potential outcome.

Reduction in volunteer participation

Volunteer participation is crucial to the success of the PFPs. A continued presence of committed volunteers at a level high enough to sustain the PFP management style is necessary to carry out the weed control duties. This could be affected in several ways.

Volunteer recruitment issues:

NCAP could cease funding the volunteer coordinator position. This would mean considerable additional time spent by PP&R staff to recruit volunteers to maintain the same level of PFP quality.

Additional PFP sites:

If additional pesticide free parks are designated, the additional volunteers needed for the new workload may not come from new sources, they may draw from existing PFPs. This will result in spreading our volunteer pool over more parks thus having fewer people at each park.

Volunteer commitment loss:

The program was set up as a three-year trial, and program success relied on the parks being maintained for this period of time. Without the three year goal it is unclear if volunteers will stay committed to the program over the long haul.

Memorandum Of Understanding (MOU) expiration

The memorandum of understanding between PP&R and the Pesticide Free Partners expired with the end of the three-year trial in October 2007. In order for the program to continue, a new agreement should be entered into either similar to the original MOU or modified to form based on the model of many of PP&R's existing friends groups. It will be important to continue with our maintenance standards agreements and include our opt out language if the need for a pesticide application arises. Also formalizing the agreement should help give a

Post Pesticide Free Parks Trial Management

sense of belonging to the volunteer groups as opposed to a more casual volunteering experience.

Pesticide free management continuance at specific parks

There have been discussions over the course of the trial about the amount of volunteer labor it takes to maintain a park the size of Arbor Lodge Park and its work burden of two ball fields. Given the fact that some PFP sites have a significantly higher workload than others, and volunteer support varies, it may be appropriate to visit the issue of PFP site choice. In the case of Arbor Lodge Park, several ballfields require a high volunteer workload and the distance to an adequate volunteer base is higher than other sites. It may be suitable at this end of the trial period to suggest an alternative park in the same neighborhood that may require fewer volunteers. There are smaller parks close by that would be significantly easier to maintain. An important consideration, however, is that Arbor Lodge Park has been recognized as a Pesticide free park in this neighborhood. PP&R may not wish to be seen as abandoning the program at this park.

PP&R's ability to fund additional volunteer coordination time

If NCAP is unable to supply their current volunteer coordinator position, it is unclear if PP&R is in a position to fund and expand the current PP&R coordinator's duties to cover that role. It is possible that the volunteer base will be established to a high enough degree that the program could continue without an additional coordinator, however PP&R must be aware that additional funding may be needed to cover these duties if a successful volunteer base is to be maintained.



A Downy Woodpecker

Flame Weeding



The flame weeding tool has proved to be a valuable tool in maintaining the trial parks. Maintaining large areas of bare ground in a weed free state without the use of herbicides requires a large amount of labor, and areas such as skinned infields can quickly require more volunteer effort than is available. In order to maintain the ball fields with limited resources, the use of other methods are required. Given the restrictions of the PFP trial, flame weeding is one option. However, the flame weeder does bring with it some serious concerns and an increased level of liability and potential hazards for park visitors, volunteers, and park infrastructure. These include fire hazards in both landscapes and structures, worker burn injuries, public burn injuries and liability, park infrastructure damage, tree and shrub damage, tank safety issues, and others. To minimize these hazards an additional training is given to a person designated as a flame weeding volunteer. Each park has only one person trained to be the flame weeder at any time. This is to clarify who has responsibility for the equipment and who was doing the work if any problems or issues should arise.

The flame weeder training was developed initially when there was only one flame weed tool available. In order to flame weed the tool either had to be delivered to the volunteer or they had to stop by and pick up the tool from the horticultural service's office. This gave the program coordinator control over the tool and who was using it but was time consuming and often deterred volunteers from flame weeding. The PFP partners were able to get the wand portion of the flame weeding tool donated from Flame Engineering, this meant each park had a flame weeding tool available. Volunteers began using their own propane tanks to do weeding in the parks. This raised several liability issues and it was determined to be better to purchase tanks and provide them to volunteers. The rationale behind the tank ownership was multifaceted and related to maintaining ownership and control of the propane powered torches. Liability associated with the flame weeders is the biggest concern and their inclusion in the program definitely creates opportunities for things to go wrong. Personal injuries and damage to parks and personal property being the main concern. To reduce risk flame weeder volunteers were selected based on their commitment to the program and their agreement and ability to operate the tool in a safe manner. The flame weeder training and sign off form was changed, after review by the city attorney and risk management, to outline storage and use requirements and establish liability if something was to go wrong (see Appendix E for document). The tanks are filled at PP&R's Mt. Tabor

Flame Weeding

yard by parks staff and the tank and wand are inspected each time the tank is filled. Only city owned tanks may be filled at this facility.

There has to date been one accident involving the flame weeder and use policy was changed to avoid it occurring again. In 2005, an area of grass at Arbor Lodge Park continued to smolder and eventually burned an area around 4ft by 4ft after volunteer work was completed at the park. This occurred because the turf was dry so it was decided flame weeding would be restricted from July 1st through October 1st. This is a period of time when weed pressure is low and fire risk high so the flame weeder seemed unnecessary and inappropriate for use.

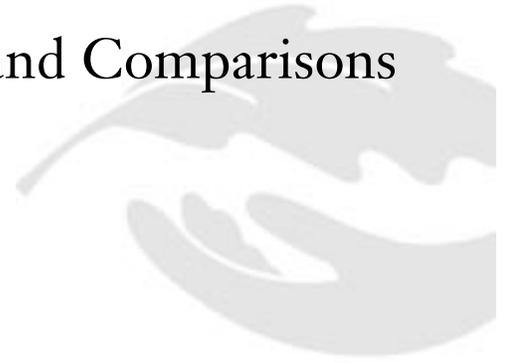
Flame weeding has occurred at all three parks though the biggest benefit has occurred at the two parks with ball fields. It takes 1-2 hours to flame weed a ball field while this was taking up to 60 person hours to weed with hula hoes. Flame weeding minimizes the weeds in the concrete cracks but does not occur frequently enough to eradicate these weeds. In gravel parking lot areas, the flame weeder has been useful to reduce the weed size.

The flame weeding raised some concerns initially as park users were concerned with what was going on. Once the park status was understood, the place of the flame weeder in maintaining the park pesticide free was better accepted.



Sewellcrest Park - field and curb with weeds

Sustainability Issues and Comparisons



PP&R takes the issue of sustainability of its park lands seriously and has worked diligently to evaluate its management methods with this in mind. Various aspects of overall park sustainability such as energy use, pollution release, water quality impacts, and other factors are part of the management decision making process, including pest management. While all of the impacts to sustainability of our park management within the Pesticide Free Parks trial are difficult to ascertain and compile, some aspects are addressed in this report.

POLLUTION RELEASE

Air pollution is a major concern to all citizens and the major source of some components of air pollution is still the car. Below is an explanation of CO₂ amounts released from automobile travel associated with park maintenance under both the current IPM program and the PFP program. The level of pollution is tied to the amount of vehicle use with each system. With the volunteer work required by pesticide free parks designation, many more people are needed to travel to the park to carry out weed management and these trips must take place much more frequently than with the IPM program. Thus there are expected increases in car-based pollution releases. The ability to attract volunteers who live in the direct neighborhood would reduce volunteer travel but it is expected that pesticide free management will always require far higher vehicle trips and miles than PP&R based IPM.

WATER QUALITY IMPACTS

While no attempt has been made to quantify or identify all potential water quality impacts from various park management styles, there are several issues raised in the trial. The two management styles differ in a number of ways, including use of pesticides, number of vehicle trips needed, and potential for erosion.

Pesticide Free Parks management eliminates pesticide use with one perceived benefit of eliminating potential water quality impacts from their use. While some may assume that pesticide use will always impact off-site areas such as surface water, this actually depends on the particular pesticide used, and how it is applied. Pesticides vary widely in their characteristics, including persistence, solubility, toxicity, and movement. They range from essentially non-toxic to highly toxic, mobile to non-mobile, volatile to non-volatile. Through careful choice and application, pesticide use with an IPM context can result in

no impact to off-site areas such as surface water ecosystems. This has been the case in PP&R's IPM program. However, use of pesticides by other entities, particularly homeowners and commercial concerns not under strict IPM oversight can clearly impact water quality. Repeated sensitive water quality testing programs in Portland's parks have demonstrated that our own IPM practices, including use of pesticides, do not appear to be presenting any significant water quality problems. This has been borne out by PP&R's selection by the National Marine Fisheries Service as a model of pest management practices near waterways containing endangered fish, and our system wide certification by Salmon Safe, an independent environmental certification organization.

Car use and vehicle trips also impact water quality due to the inherent release of substances that affect water quality and aquatic ecosystems. These substances can include heavy metals and other persistent materials that may have direct influence on aquatic ecosystems. PFP management increases vehicle trips due to the large amount of volunteer participation necessary.

Weed control activities, particularly mechanical and manual methods, can expose soil surfaces and lead to erosion and sedimentation of waterways. However, this is highly dependent on site location and other factors. It is not expected that any PFP activities in the three trial parks led to any significant movement of soil off-site. It should be noted that mechanical or other physical weed removal projects in sensitive sites such as riparian zones can present erosion problems and management choices should reflect this potential problem.

HEALTH: WORKER AND VOLUNTEER INJURIES

Worker and citizen exposure to potential hazards is always a concern when determining appropriate weed control practices. While it may be assumed that only pesticides or herbicides bring risks to workers and citizens, all methods of weed control can result in hazards or risks. It is also important to understand that pesticide use within PP&R's IPM program is carefully researched and controlled to minimize potential risks. Choice of pesticide materials is screened and prescribed so that their use does not place park patrons at any undue risk.

Reduced exposure to pesticides is the crux of the Pesticide Free Park program and this assumes that there is a hazard caused by all pesticide use. While some pesticides are capable of creating hazards, the current PP&R IPM practices are very specific in the low toxicity products used, the public notification and signage required, and the placement of pesticides so that exposure to park users is minimized. High toxicity

pesticides are not being applied to neighborhood parks in the PP&R IPM-based park management. General park turf areas are rarely if ever treated for broadleaf weeds, and chipped play areas are also declared no spray zones in all parks. These practices reduce exposure to pesticides in turf and play areas that are identified as locations where small children are most likely to come into contact with pesticides. Therefore risks from pesticide use in PP&R neighborhood parks are extremely low to non-existent. This may not be the case in other systems, particularly those not adhering to a careful IPM oversight process.

Flame weeding in parks is a potential hazard exposure that had to be evaluated prior to its inclusion in the program. The opportunity for injury to the operator or a park user is minimized through training and specific rules on when and how the tool is used. The risk of exposure is only present while the tool is being operated and the flame weeder operators usually pick times when the park is not busy to do this job.

Manual weed control with hand tools has a risk associated also but only to the volunteers doing the work, not to park users. Training on safe tool handling is provided to the volunteers to avoid injury to other volunteers due to inappropriate handling of tools. The volunteers are also given tips on weeding to reduce injury. Ideally most weeding should be done with a long handled tool to prevent back injuries. At most work parties however some weeding is done with short handled tools which require the user to bend down or kneel on the ground to perform weeding duties. Weed removal in this position has been identified as a potential trigger for long term back injury. Since most volunteers only work a short time (about 2 hours) the risk is reduced, though still a concern.

CO₂ OUTPUT AND PFP TRIAL

CO₂ and park management practices

To further examine the sustainability of certain park management practices CO₂ release amounts for various management approaches were explored.

CO₂ and prior herbicide use at Lair Hill Park

For pesticide use comparisons, a 2006 study (Saunders et al) was used as a reference to determine the carbon footprint of the production, packaging, transportation and use of herbicides. Using the study figures it is possible to estimate the contribution of pesticide use in parks to carbon in the atmosphere. For Lair Hill Park in the three years shown above, an average of 20oz per year of Roundup Pro was used, 20lb XL2G, and 20oz of Surflan herbicide.

Sustainability Issues and Comparisons

CO₂ production is 0.06 KG CO₂/MJ (energy unit), Glyphosate production, packaging, and transportation uses 550MJ/KG ai (active ingredient). Other Herbicides use 310MJ/KG ai.

For Roundup Pro

$0.06\text{KG CO}_2/\text{MJ} \times 550\text{MJ}/\text{KG ai} \times 1.82\text{KG ai per gallon} / 128\text{oz per gallon} \times 2.2\text{lb per KG}$
 $= 1.03\text{lb CO}_2/\text{oz} \times 20\text{oz Roundup} = 20.6\text{lb CO}_2$

For Surflan

$0.06\text{KG CO}_2/\text{MJ} \times 310\text{MJ}/\text{KG ai} \times 1.82\text{KG ai per gallon} / 128\text{oz per gallon} \times 2.2\text{lb per KG}$
 $= 0.58\text{lb CO}_2/\text{oz} \times 20\text{oz Surflan}/\text{yr} = 11.6\text{lb CO}_2$

For XL2G

$0.06\text{KG CO}_2/\text{MJ} \times 310\text{MJ}/\text{KG ai} \times 0.9\text{KG ai per 45KG} \times 2.2\text{lb per KG}/100\text{lb}$
 $= 0.37\text{lb CO}_2/\text{lb product} \times 6\text{lb}/\text{yr} = 2.22\text{lb CO}_2$

Total CO₂ from herbicide use in the park 34.4lb CO₂

Adding CO₂ production from park staff vehicle trips to the park:

Typical Park's vehicle F150 FWD V8 pickup (14mpg) produces 1.92lb CO₂ per Mile (source Terrapass.com). Two trips per year for herbicide applications, average round trip from work site to park is 4 miles. 4 miles X 1.92lb CO₂/mile = 7.68lb CO₂ Travel plus material used = 7.68lb CO₂ + 34.4lb CO₂
 $= 42.08\text{lb CO}_2/\text{year from Herbicide use and application at Lair Hill Park.}$

CO₂ and PFP Volunteers at Lair Hill Park

Since most people in the Portland Metro area who travel use a motor vehicle (only 3.5% cycle and 5% use mass transit) there is a CO₂ cost for volunteering also. The average car @ 25mpg produces 1.08lb CO₂ per mile.

Average trip length to the park based on 37 trips less than 2 miles, though 32 of these did not travel at all as they were at the school to pick up their children, 8 averaged 3.5 mile and 7 more than 5 miles. Therefore the average trip length is $5 \times 2 \text{ miles (1 mile each way)} + 8 \times 7 \text{ miles} + 7 \times 10 \text{ miles} / 52 = 2.6 \text{ miles}$. Since 20% of people may have car pooled and 5% bicycled, the calculation 75% of $52 \times 2.6 \text{ mile per trip} = 101.4 \text{ miles traveled (if every one made only one trip)} @ 1.08\text{lb CO}_2/\text{mile}$
 $= 109.5\text{lb CO}_2 \text{ over three years.}$
 $= 36.5\text{lb CO}_2 \text{ per year.}$

This is the minimum amount based on each person only making one trip. Since 19 people came to two work parties and 13 came to 2 or more, additional trips occurred during the three years. Also unaccounted for are the 45 people who did not indicate how far they traveled to come to the work parties.

CO₂ and prior herbicide use at Sewallcrest Park

Following the format for CO₂ production from the Lair Hill Park discussion, average herbicide use for Sewallcrest Park is 19.3oz Roundup pro per year. $19.3\text{oz} \times 1.03\text{lb CO}_2/\text{oz Roundup} = 19.92\text{lb CO}_2$ plus 4 miles $\times 1.92\text{lb CO}_2/\text{mile} = 27.6\text{lb CO}_2/\text{year}$ from pesticide use at Sewallcrest Park.

CO₂ and PFP Volunteers at Sewallcrest Park

Average trip length to the park is based on 51 people traveled less than 2 miles, 7 averaged 3.5 mile and 10 more than 5 miles. So the average trip length is $51 \times 2 \text{ miles (1 each way)} + 7 \times 7 \text{ miles} + 10 \times 10 \text{ miles} / 68 \text{ people} = 3.7 \text{ miles}$.

Since 20% of people may have car pooled and 5% cycled so for the calculation use 75% of $68 \times 3.7 \text{ miles per trip} = 188.7 \text{ miles traveled}$ (if everyone made only one trip) @ $1.08\text{lb CO}_2/\text{mile} = 204\text{lb CO}_2$ over three years. 68lb CO_2 per year.

This is the minimum amount based on each person only making one trip. 9 people came to two work parties and 12 came to 3 or more, additional trips occurred during the three years. Also unaccounted for are the 7 people who did not indicate how far they traveled to come to the work parties.

CO₂ and prior herbicide use at Arbor Lodge Park

Following the format for CO₂ production from the Lair Hill Park discussion, average herbicide use for Arbor Lodge Park is 47oz Roundup Pro per year. $47\text{oz} \times 1.03\text{lb CO}_2/\text{oz} = 48.41\text{lb CO}_2$ plus 20 miles (5 trips per year) $\times 1.92\text{lb CO}_2/\text{mile} = 86.81\text{lb CO}_2/\text{year}$ from pesticide use at Arbor Lodge Park.

CO₂ and PFP Volunteers at Arbor Lodge Park

Average trip length to the park is based on 31 people traveled less than 2 miles, 12 averaged 3.5 mile and 10 more than 5 miles. If the average trip length is $31 \times 2 \text{ miles (1 each way)} + 7 \times 7 \text{ miles} + 10 \times 10 \text{ miles} / 53 \text{ people} = 3.98 \text{ miles}$.

Since 20% of people may have car pooled and 5% cycled or walked so for the calculation use 75% of $53 \times 3.98 \text{ miles per trip} = 158.2 \text{ miles traveled}$ (if everyone made only one trip) @ $1.08\text{lb CO}_2/\text{mile} = 170.86\text{lb CO}_2$ over three years. 56.95lb per year.

Sustainability Issues and Comparisons

This is the minimum amount based on each person only making one trip. 13 people came to two work parties and 18 came to 3 or more, additional trips occurred during the three years. Also unaccounted for are the 45 people who did not indicate how far they traveled to come to the work parties.

Propane and CO₂ production

CO₂ production from propane combustion is figured at a ratio of 12.4lb CO₂/gallon of propane. (<http://www.conservationfund.org>) This does not include energy of production or transportation of the product so is not the total CO₂ amount. Because of difficulty finding accurate figures to use the rate of 12.4 gallons will be used though this does not represent total CO₂ involved in using propane.

Arbor Lodge Park has been the heaviest user of propane using 2-3 tanks of propane per year. At Sewallcrest Park around 1 tank per year is used and at Lair hill around half a tank, as there are limited areas to flame. The tanks hold 5 gallons (20lbs) of propane using data from the Flame Engineering web site (<http://www.flameengineering.com>) this gives just under 9 hours burning time per tank.

CO₂ is released due to propane combustion at 12.4lbs per gallon of propane so each tank is equivalent to 62lbs CO₂. Arbor Lodge Park releases 3 times this or 186lbs, Sewallcrest Park 62lbs, and Lair Hill Park 30lbs from propane use.

Comparison of CO₂ release per year for one averaged trial park of 5.6 acres; PFP management model compared to current Portland Parks IPM model.

PFP Park:

55.26lb per year from volunteer travel plus 96lb CO₂ per year from Propane.

Total: 151.26lbs per year

*This figure does not include CO₂ release of propane production and transportation, this total underestimates CO₂ release.

Prior PP&R IPM Management:

52.16lbs per year

*Includes CO₂ release of herbicide production and transportation.

Appendix A

CRITERIA USED TO SCREEN THE TRIAL PESTICIDE FREE PARK CANDIDATES

Size

Park size should not be overly burdensome for the trial program. Parks 6 acres and below in size were first assessed as candidates for the volunteer effort. Some additional parks up to 10 acres in size were also screened and assessed for their pest management needs to see if they would be also good candidates. Parks in the 6-10 acre range were included as candidates only if their overall pest management needs were similar in scope to the smaller parks.

Location

The park sites were chosen to result in a well distributed geographical layout throughout our service area. One park from the N or NE, one park from the SE or S, and one park from the West town were thought to provide the best distribution. A diverse mix of neighborhood environments was also desired. Economic equity was a screening factor, and the locations were not to be in only low or in high income areas.

Access

There needed to be reasonable public parking and access to the park site.

Support

The surrounding population needed to be adequate in size and interest to support a volunteer effort.

Amenities

The park needed to have a typical array of neighborhood park amenities, with no site being overly dominated by a single purpose or lacking basic park features. Neighborhood parks typically include turf, trees, playgrounds, ball fields, fence lines, shrub beds, tree rings, and so on. A candidate park needed to include a good representation of these features. Less common features such as community gardens and a dog off-leash area also were included in at least one of the chosen sites.

Pest pressure

The parks were screened for the expected burden of work. Those parks with a high need for pest management or specialized pest management were not included. Past use of pesticides at the sites was also evaluated. Those sites that relied on a relatively higher use of pesticides for general maintenance were not considered as candidates. Presence of problematic pest management plantings was assessed, such as the presence of elm trees. The park candidates were expected to have an average need for pest control work, being reflective of typical neighborhood park pest pressure.

Noxious weed removal projects

Park sites were screened for anticipated and ongoing projects to restore natural plant communities by removal of invasive noxious weeds over substantial areas. While a park site was not be excluded due to the presence of some non-native invasive weeds, any large-scale removal project was not compatible with trial park designation.

Appendices

Safety issues

Parks with an expected serious safety issue relating to pest presence were not considered for the trial designation. Public safety is a priority and conflicts that would hamper safety efforts were not suitable.

Park construction and undeveloped parks

Parks that were undeveloped, under construction, or are anticipated to be impacted by construction in the near future were not considered for site designation.

Appendix B

PORTLAND PARKS AND RECREATION'S INTEGRATED PEST MANAGEMENT PROGRAM

Portland Parks has an Integrated Pest Management (IPM) program in place that has reduced our reliance on pesticides in all of our parks. The standard for responsible and sustainable management IPM uses many strategies to achieve goals, combining cultural, physical, biological and Pesticidal methods in a holistic manner to control pests. The IPM process determines first if a pest needs to be managed and if so, when, where and how best to do it. This approach has responsibly addressed health economic and environmental concerns our parks. The program is a model for other park systems.

Portland Parks and recreation has greatly reduced their reliance on pesticides and has eliminated products that may cause problems. Only carefully selected materials are approved for use by our state licensed applicators. We are known for using far less pesticides than are commonly applied to commercial or home landscapes. For example, unlike most commercial and home lawns pests and weeds in PP&R turf are managed by cultural methods such as aeration, over seeding and other method rather than a reliance on pesticides. We have reduced our use of broadleaf herbicides by over 90 % since our IPM program was put in place. Outside organizations and agencies have examined our IPM program and have given certification and validation to the PP&R IPM program.

Additional information about the program and its Salmon Safe and NMFS exemption can be found at <http://www.portlandonline.com/parks/index.cfm?c=39794>

Appendix C

Memorandum of Understanding (MOU)

PESTICIDE FREE PARKS PROGRAM GOALS

Portland Parks and Recreation (PP&R) and the Pesticide Free Partners (PFP) desire to undertake a three-year, three-park trial Pesticide Free Parks Program. Through this program, volunteers will be recruited and trained by PFP to control weeds as an alternative to using current PP&R practices. The trial will determine if this is a viable option while meeting the goals listed below. The program will be evaluated after three years based on specific evaluation criteria.

Through this trial, the parties endeavor to achieve the following mutual goals:

1. Reduce the use of pesticides in Portland Parks and Recreation by testing an alternative methodology in three parks.
2. Provide a pesticide-free alternative to park users, while still supporting normal use of the park.
3. Continue to search for opportunities to reduce pesticide use wherever feasible.

PP&R specific goals:

1. Determine whether the community actively supports the replacement of pesticide use in selective parks by volunteering on a regular basis to control weeds.
2. Determine the financial impact of the program related to program costs and benefits and bureau priorities.
3. Determine which, if any, specific park maintenance methodologies used in this program are applicable to maintenance in other Portland parks.
4. In Pesticide Free Parks, continue to have a functional and standard appearance comparable to other similar PP&R developed parks, unless otherwise agreed upon, and continued support by neighbors and the community.

PFP specific goals:

1. Make the surrounding community more conscious of their own pesticide use and the need to minimize it, by modeling alternative methods and through educational materials, alternatives demonstrations and work parties.
2. Provide a model for Pesticide Free Parks programs in other cities.
3. Continue and expand the program based on success.
4. Educate and involve community members through the program.
5. The Pesticide Free Partners meaningfully contribute to the success of the program.

Continuation of MOU Appendices:

- | | |
|--|--|
| A PP&R Responsibilities | E List of the Pesticide Free Partners |
| B PFP Responsibilities | F Map of Sites |
| C Evaluation Criteria for Program | G Maintenance Practice Change Proposal |
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AGREEMENT

Pesticide Free Parks Program Pesticide Free Partners, City of Portland Parks and Recreation

This Agreement, entered into this 9th day of January 2006, is by and between the City of Portland, acting through Portland Parks and Recreation (PP&R), and the Pesticide Free Partners (PFP), a coalition of non-profits with shared goals. PP&R and PFP (the “parties”) desire to undertake a three-year three-park trial Pesticide Free Park Program (the “Program”). The Program will be evaluated after three years based on specific evaluation criteria (see Appendix C).

1. Duration of Agreement

Portland Parks and Recreation and the Pesticide Free Partners began implementing the Program starting October 1, 2004. The three-year trial period will end October 1, 2007. The parties may agree to renew and expand this program on an annual basis thereafter.

2. Park Locations

The parties agree that the three parks selected for the Program are Sewallcrest Park (does not include Sewallcrest Community Garden), Arbor Lodge Park, and Lair Hill Park (the “Pesticide Free Parks”).

3. Points of Contact

Portland Parks & Recreation’s primary contact for this project is:

Name: Steve Morgan
Phone: (503) 823-1636
Address: 6437 SE Division
Portland, OR 97206

Pesticide Free Partners’ primary contact for this project is:

Name: Megan Kemple
Phone: (541) 344-5044 extension 17
Address: Northwest Coalition for Alternatives to Pesticides
PO Box 1393
Eugene, OR 97440-1393

4. Notice

Any notice provided for under this Agreement shall be sufficient if in writing and delivered personally to the following addressee or deposited in the United States Mail, postage prepaid, certified mail, return receipt requested, addressed as follows, or to such other address as the receiving party hereafter shall specify in writing:

If to the City: City Nature Manager
Portland Parks and Recreation
1120 SW 5th Avenue, Suite 1302
Portland, OR 97204

With a copy to: Property Manager
 Portland Parks and Recreation
 1120 SW 5th Avenue, Suite 1302
 Portland, OR 97204

If to PFP: Megan Kemple
 Pesticide Free Parks Coordinator
 Northwest Coalition for Alternatives to Pesticides
 PO Box 1393
 Eugene, OR 97440-1393

5. Insurance

As volunteers for PP&R, PFP volunteers are covered by the policies which apply to all volunteer workers. To ensure that they are aware of coverage in the event of accident or injury while doing volunteer work, all individual volunteers must annually sign a PP&R Insurance Information for Volunteers form prior to beginning work. PFP shall not be liable for accident, injury, health insurance or any other claims by volunteers while the volunteers are performing work as assigned for PP&R in Pesticide Free Parks.

6. Exceptions

PP&R shall not apply any pesticides in the three Pesticide Free Parks unless doing so is required to meet a health and safety requirement. If PP&R determines that an application of pesticide is needed, it will be made following standard PP&R Integrated Pest Management Program procedures, which include, but are not limited to, providing notice of the application in the location where the pesticide is applied. In addition, if pesticide applications are required by outside agencies to control a significant invasive pest or public health threat, for example gypsy moth or West Nile Virus, PP&R shall not be in violation of this Agreement and this Agreement will remain in effect. In the event these exceptions are required, the PFP shall be notified no later than the next business day following an application or after notification is given to PP&R of an application by an outside agency. When PP&R is given advance notice of an upcoming application by an outside party PFP will be notified as soon as possible prior to the application.

7. Extent of Agreement and Modification

This Agreement, together with all the appendices, represents the entire agreement between the parties and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be amended only by written instrument properly signed by both parties as defined in the Notices (Section 4).

8. Early Termination of Agreement

It is the intent and expectation of the parties that this Agreement, and the ongoing relationship between the parties, shall continue in effect for the full Term of this Agreement. Nonetheless, the parties recognize that unforeseen circumstances conceivably could arise which would require one or the other of them to terminate this Agreement.

- A. Either party may terminate this Agreement with thirty (30) days written notice to the other party for any reason deemed appropriate in either party’s discretion.
- B. Either party may terminate this Agreement in the event of a breach of the Agreement by the other. Prior to such termination, however, the party seeking the termination shall give to the other party

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written notice of the breach and of the party's intent to terminate. If the party has not entirely cured the breach within thirty (30) days of the notice, then the party giving the notice may terminate the Agreement at any time thereafter by giving a written notice of termination.

In the event this Agreement is terminated under subsection A or B of this section, the parties shall have no further liability or responsibility toward one another. Nothing in this Section shall absolve either party of any responsibility or liability accruing before such termination.

9. Ongoing Assessment

The parties agree that the Pesticide Free Parks will be evaluated on an annual basis; through this program assessment, changes for the following year will be identified, including potential location changes and this Agreement and/or its attachments will be modified to reflect the changes.

10. Evaluation of Success after 3 Years

The parties will evaluate the program's success after three years based on the evaluation criteria in Appendix C. The evaluation points include whether this program is suitable and sustainable for application in other parks and under what circumstances; whether aspects of this approach, can be integrated into overall maintenance efforts throughout our system.

IN WITNESS WHEREOF, the parties have caused this Permit to be executed in duplicate on the dates shown below.

Northwest Coalition for Alternatives to Pesticides will be signing the agreement on behalf of PFP.

NORTHWEST COALITION FOR ALTERNATIVES TO PESTICIDES

Megan Kemple
Pesticide Free Parks Coordinator

Date

CITY OF PORTLAND, BUREAU OF PARKS AND RECREATION

Zari Santner
Director of Parks and Recreation

Date

MOU Appendix A: PP&R Responsibilities

1. Maintenance Standards and Practice

- A) PP&R and PFP will develop standards and a written maintenance plan that are acceptable to the local community, meet the needs for the multiple uses of the designated parks, and support our common goals. These standards and plan are subject to annual review by both parties.
- B) PP&R staff will estimate the labor and materials necessary to maintain park areas manually and will meet with the PFP contact person to plan a volunteer maintenance schedule to accomplish the required tasks.
- C) General grounds maintenance activities, such as pruning, planting, edging and mulching shall continue and not be reduced in the Program parks except as part of an overall PP&R budget reduction.
- D) Debris bagged by volunteers will be picked up and disposed of by PP&R staff. Specific disposal needs can be adjusted by mutual agreement.
- E) PP&R will provide documentation of maintenance previously done through the use of pesticides over the past three years.

2. Funding

- A) Funding for this program is subject to the same changes as all other PP&R programs and services. Should it be necessary, either party can seek additional funding from alternative sources.

3. Equipment and Supplies

- A) PP&R will supply standard volunteer equipment and supplies. Specialized equipment used in the PP&R alternatives trial program or other park programs may be available for use, depending upon the suitability of the equipment and scheduling needs.
- B) PP&R will approve the use of suitable power equipment and flame weeders but may attach specific conditions. Individual volunteers will be certified by PP&R to use the equipment after demonstrating sufficient knowledge and skill.
- C) PP&R will maintain and re-fuel all power equipment and the flame weeder.

4. Volunteer Coordination

PP&R will assist in the coordination of volunteers in the first three years by:

- A) Providing a liaison between PFP and various PP&R units;
- B) Securing and providing tools and materials;
- C) Developing a maintenance plan;
- D) Developing a tool safety certification protocol;
- E) Coordinating volunteer forms and program tracking;
- F) Jointly coordinating outreach with neighboring communities;
- G) Attending some work parties and all assessment meetings;
- H) Posting volunteer and program info on the PP&R website.

MOU Appendix B: PFP Responsibilities

1. Maintenance Standards and Practice

- A) PFP will implement practices to replace the maintenance previously done through the use of pesticides. This work will be done by volunteers.
- B) Maintenance work, either by volunteers or staff, is done to support recreational uses and needs to be scheduled and performed in ways that minimize interference with other public use. If there is a conflict between maintenance work and other scheduled uses, the recreational use prevails. Volunteer work will be scheduled and PP&R notified in advance to assure that work will not conflict with PP&R units, other volunteer efforts, permitted events, and the general public.
- C) Debris will be collected following work parties. PFP will notify the PP&R contact when debris has been left on site. Debris generated by volunteers must be bagged, and left at designated spots. Bags can not exceed 30 lbs. Other arrangements for pick-up and disposal can be made by mutual agreement.
- D) All materials, including compost and mulch, must be approved by the PP&R contact before it can be used on a park site. No pesticides or fertilizers may be applied in the three Pesticide Free Parks by volunteers.
- E) Proposed changes to the park infrastructure or maintenance standards and demonstration projects must be submitted to and approved by PP&R before implementation. Proposals will be reviewed for safety, budget impact, impact on park users and protection of Park assets on a case-by-case basis. See Appendix G for the proposal form.

2. Equipment and Supplies

- A) Power equipment used by volunteers on site must be operated by a trained operator using all manufacturer recommended personal protective equipment and meeting all safe-operating requirements.
- B) PFP will request to use specific types of power equipment and names of volunteers who will use it in advance.
- C) PFP will work with PP&R in the scheduling of equipment use.

3. Volunteer Coordination

- A) PFP will designate key volunteers for the Pesticide Free Program for each of the three park sites. There may be times when there is no acting Key Volunteer for one or more of the parks. In this case, the PFP contact person will act as the Key Volunteer for the park.
- B) Repeated negligence by volunteers in performing work may be cause to terminate this agreement.
- C) PFP is responsible for recruiting, contacting, assembling, and directing volunteers at the agreed upon times for the duration of this agreement.
- D) Work done by volunteers, both individuals and work parties, will be scheduled and the schedule provided to the PP&R contact person. PFP will have volunteers fill out PP&R volunteer forms before starting work. Forms must be sent to PP&R on a scheduled basis.

MOU Appendix C: Evaluation Criteria and Methodology

The following criteria will be used to evaluate the program:

1. Maintenance Standards/Site Monitoring

Criteria: The Program techniques support general and recreational park uses as well as, or better, than while using “normal” park maintenance techniques.

Assessment:

- 1) PP&R will inventory the parks and take pictures of the conditions under previous maintenance practices.
- 2) Quarterly meetings will take place at each of the three parks between PP&R program coordinator and one service zone staff member a PFP representative and the Key Volunteer for that park. This meeting will be used to assess maintenance, identify issues, solve problems, monitor any alternative demonstrations being conducted by PFP and identify upcoming maintenance activities. The park will be graded by all parties based on the criteria laid out in the Maintenance Standards guide (See Appendix H) using a form generated by PP&R. These reports will be collected and reviewed at the end of the three-year trial.

Criteria: The Program will be considered successful when the three designated pesticide free parks have been managed without the use of pesticides for three years (see exceptions).

Assessment: PP&R will document any pesticide applications made at these three locations.

2. Volunteer Involvement

Criteria: Program has sustained volunteer involvement.

Assessment:

- 1) Key volunteers have been in place in each of the three parks between October 1, 2005- October 1, 2007 and have performed their duties adequately during at least 10 months of each year.
- 2) Sufficient people are present to perform most duties at most work parties and days. Records of volunteer hours, interviews of key volunteers, and quarterly assessments will be used.

Criteria: This volunteer effort needs to be community based and replicable by PP&R staff.

Assessment: Volunteer sign-in sheets will indicate level of volunteer involvement, how the individual heard about the program, the neighborhood in which this individual resides and the individuals connection to the park.

3. User Group Support

Criteria: The Pesticide Free Parks will continue to be supported by neighbors and the community.

Assessment: Program meets community and agreed on program standards for safety and appearance as determined by quarterly walk through evaluations. Program has continued positive feedback from public and has not generated an increase in public complaints.

Criteria: Program meets the needs of the baseball users groups.

Assessment: A survey of the presidents of the little league associations at both Sewallcrest and Arbor Lodge Parks will be done. If possible, a survey of the individual users will be taken via the presidents.

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4. Funding

Criteria: Determine the financial feasibility of continuing the program after the trial period related to program costs and benefits and bureau priorities.

Assessment: Continuously collect program time and materials costs through employee time sheets and material usage reports. Collect information relating to the volunteer coordination aspect of the program by surveying PFP program coordinator and Key Volunteer from each park regarding time spent on the program.

MOU Appendix D: Outreach, Signage and Alternative Demonstrations

Outreach

- A) PP&R and PFP will jointly organize one event in each of the three neighborhoods each year with park users to recruit volunteers and inform neighbors about the program. Costs associated with publicizing this event, except PFP staff time, must be approved in advance, and will be assumed by PP&R. PP&R and PFP will each assign a contact person to organize the event. PP&R or PFP will attend one neighborhood meeting in each of the three neighborhoods each year to recruit volunteers, inform neighbors about the program, assess maintenance, and review functional and appearance standards of the park.
- B) Informational or directional signs identifying the program and activities will be produced by PP&R with input from the PFP contact.
- C) PP&R will include information about the Pesticide Free Parks program on its IPM webpage on the PP&R website. Opportunities to volunteer will be posted on the PP&R website.
- D) PP&R will produce outreach or informational materials about the program or program activities to be distributed on site, or as part of the program. Any language referring to volunteer opportunities by PP&R or PFP or its members is subject to approval by both organizations. Any future outreach materials and brochures will reflect the use of a variety of alternatives practices and reflect the mutual goals of the program.
- E) Pesticide Free Partners may produce outreach or informational materials about the program or program activities to be distributed on site, these materials are subject to review and approval by PP&R staff.

Signage

The following signage will be in place in each Pesticide Free Park:

- A) A Pesticide Free Park sign adjacent to the sign identifying the park by name.
- B) A brochure rack attached to the Pesticide Free Parks sign stocked with Pesticide Free Parks brochures.
- C) If there is an ongoing demonstration project there will be an explanatory sign in place. Sign language is to be approved by both PP&R and PFP.

Alternatives Demonstrations

There will be alternative demonstration trial projects in place in each park at some point during the program.

PP&R will propose demonstration projects which will be reviewed by PP&R as outlined in Appendix B: Section 3, “Maintenance Standards and Practices”.

PP&R may implement IPM trial projects in Pesticide Free Parks if appropriate within the PP&R IPM trial program parameters. PP&R IPM trial programs are separate from the Pesticide Free Parks Program but may be able to overlap in order to provide community education.

MOU Appendix E: List of the Pesticide Free Partners

Northwest Coalition for Alternatives to Pesticides

Oregon Sierra Club

Portland Audubon Society

Willamette RiverKeeper

Physicians for Social Responsibility, Oregon Chapter

Xerces Society for Invertebrate Conservation

Association of Environmental Health Academic Programs

Oregon Center for Environmental Health

Oregon Wildlife Federation

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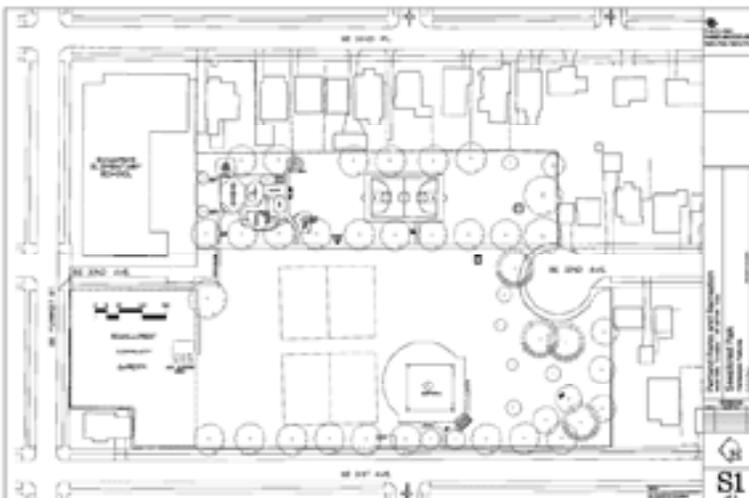
MOU Appendix F: Maps of Sites



Arbor Lodge Park



Lair Hill Park



Sewallcrest Park

MOU Appendix G: Maintenance Practice Change Proposal Document

Pesticide Free Parks Alternatives Demonstration Proposal

SECTION 1: To be filled out by volunteer group

Please attach any additional information. When providing a map or diagram, please indicate direction with a north arrow and provide measurements where applicable.

Park Name: _____

Area of park to be worked on: (please indicate project area on park map and attach)

Idea proposed by PFP: (attach drawing where appropriate)

Potential impact on park users:

Potential asset protection issues:

Potential safety concerns:

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Role of PFP in project:

Role of PP&R in project:

Potential cost associated with project:

Method for evaluating success of project:

Maintenance plan: (where applicable)

Other ideas or comments:

Please send completed form and attachments to:

City Nature Manager
Portland Parks & Recreation
1120 SW 5th Avenue, Suite 1302
Portland, OR 97204

MOU Appendix H: Maintenance Standards Guide

**Portland Parks and Recreation Maintenance Guide for the
Pesticide Free Parks Trial Program**

Tree Circles are circles around trees that are free of grass and weeds. They are necessary, specifically, for the establishment phase of young trees when they need freedom from turf competition. The purpose of maintaining tree circles is to protect tree trunks and roots from damage caused by mowers and other equipment such as turf aerators etc. While there is no defined size for tree circles, a 3' diameter is about as small as they should be and they should be large enough that any above ground roots are within the circle. Tree circles should have defined edges and be circular in shape. This maintenance should be accomplished with hand weeding, where above ground roots exist, or with a scuffle hoe or hand tool of choice where the soil surface is clear of roots. It is important that as much of the soil as possible is shaken out of weed clumps when they are removed. If this is not done, over time the soil grade will drop exposing surface roots and creating hazards.

Tree circles are not mulched, in most cases, in order to prevent above ground root rot and trunk damage, as well as to prevent creating a weed seed bed. Another reason mulches aren't commonly used is because they are invariably spread by people, dogs and mowers all over the surrounding turf, creating problems. Most established tree circles have relatively hard packed soil so weed pressure is low making maintenance without mulch easier than with.

Mulches are used when young trees and tree circles are being established. When trees are planted, the turf is removed and soil level is often brought down below turf grade. Mulches are used to level the grade and protect soil moisture for the young tree.



Time to weed

Phone poles, goal posts, fire hydrants, flat poles, guy wires and metal traffic barriers also need to have grass and weed free circles around them to protect them and because mowers can't mow right up next to them. These circles should be maintained to the size that they have been historically which will be

approximately 8-12” wide from the base of the object. This clearing can be accomplished with a scuffle hoe, or hand tool of choice, and removing of the debris with a rake and wheelbarrow. Again, it is important that as much of the soil as possible is shaken out of weed clumps when they are removed to avoid creating a hole over time.

Fence Line and other park perimeter grasses are kept maintained to the height of the adjacent lawn in order to maintain an attractive appearance and to keep these areas free of trash and dangerous objects. They are also kept low to prevent the establishment of more difficult to control weeds and to keep weeds from flowering or seeding. Weeds should not be allowed to grow up or around the fence.

Shrub beds will be kept mulched (in most cases) and pruned by Portland Parks and Recreation employees but should be weeded by volunteers. Some amount of weeds are expected but they should not cover more than 10% of the ground between clean-ups and should never be more than 5” tall. Beds should be relatively free of weeds after clean-ups.

Play Areas. Generally, play areas have a thick layer of play chips present that will help to suppress weeds. Where weeds are present, hand weeding is probably going to be more effective than using a hoe. If a hoe is used, chips must be raked back evenly over the area for safety.

Ball Fields. It is important that infields be kept weed free to prevent “bad bounces” of baseballs from injuring players. Weeds can also cause players to slip and fall as well as create undesirable aesthetic conditions for the infield. Other areas to be maintained weed free are dugouts, areas behind the back stop and fence lines. This should be accomplished with scuffle hoes, rakes and wheelbarrows. If big divots are left from hoeing, volunteers should attempt to rake the grade smooth again.

Curbs and Sidewalk Cracks. Volunteers will be responsible for keeping all curbs free of weeds in curb cracks and where the curb meets the street pavement. They are also responsible for weeds that grow through sidewalk cracks. These areas may be flame weeded in accordance with PP&R’s agreement with PFP. Only authorized persons shall use this or any other power tool on park’s property.

Gravel Parking Areas. PP&R understands that these areas are hard to maintain weed free without the use chemicals. However, these areas should not be allowed to get more than 20% covered in weeds and they should not reach more than 5” tall. These areas may be flame weeded in accordance with PP&R’s agreement with PFP. Only authorized persons shall use this or any other power tool on park’s property.

Sport Courts need to be kept weed free to prevent player injuries. No flame weeding or power equipment shall be used on sport courts. All weeding should be done by hand to prevent damage to sport court surfaces.

Horse shoe pits should be kept weed free to be useable by the public.

Turf area weeds will be controlled by PP&R staff using the same integrated pest management tactics that have been used in the past. This is done with core aerating, over-seeding, top-dressing and liming.

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MOU Appendix I: Glossary

Key Volunteer: An unpaid community member who facilitates the Program by identifying needed park work and directing volunteers in performing the tasks safely and to the mutually agreed upon park standards. This person also ensures that the following tasks are completed: equipment needs are identified, arranged for, and in some cases acquired, community members and volunteers are notified about upcoming work parties, and that approved power equipment is only operated by certified individuals. The Key Volunteer acts as a liaison between PP&R, volunteers and PFP, completes and forwards all required paperwork to PP&R and attends quarterly park assessment meetings.

Program Coordinator: The individuals identified by PP&R and PFP as the single points of contact for this Program. These people are responsible for, among other things, working with parks user groups and acting as program representatives to media sources.

Appendix D

COMMUNITY COMMENTS

Lair Hill Park and Cedarwood School

This input is from Xander Patterson who is the Administrator at Cedarwood School and a Key Volunteer for the PFP program.

“The PFP program is very important to Cedarwood. We highly value the health benefits of not having pesticides applied to areas where our children play, as well as the environmental benefit of reducing pesticide use. The participation of our students and parents in work parties strengthens our school community and our ethic of contributing to the wider community. Because we use the park so much we are glad to give something back.

During this coming school year we plan to begin to develop an environmental education curriculum that will cover many aspects about how we interact with the environment, including our relationship to the park. The plan is still in the vague idea stage, but we hope to teach our students about the flora and fauna that inhabit the park, how they interact as an ecosystem and with the larger ecosystem, how human activity impacts them and so on. We hope the program will include making significant improvements to the park over time such as replacing the ivy along the west and north edges with native vegetation that is better for reducing soil erosion and more beneficial to wildlife. Of course we will obtain permission (and hopefully some help) from Parks and Rec for any projects we plan.”

Appendix E

ADDITIONAL INFORMATION AND LINKS

CO₂ information resources

Propane

Carbon Coefficient: 12.40 lbs CO₂ /gallon

The factors in the U.S. GHG Inventory state that liquefied petroleum gases (LPG) have a carbon content of 17.20 Tg Carbon / QBtu – propane makes up the majority proportion of what is considered LPG. With a conversion, propane has a factor of 12.40lbs CO₂/gallon.

<http://www.conservationfund.org>

Vehicle Emissions

Carbon factor from Environmental Protection Agency (2005) Inventory of U.S. Emissions and Sinks: 1990-2001 Annex B: Methodology for Estimating the Carbon Content of Fossil Fuels,

<http://yosemite.epa.gov/oar/globalwarming.nsf/content/ResourceCenterPublicationsGHGEmissionsUSEmissionsInventory2003.html>

The Federal Highway Administration's (FHWA) "Highway Statistics 2001" gives average values of 22.1 mpg for passenger cars and 17.6 mpg for light trucks as a fleet wide average in for the year 2001 (includes all vehicles on the road in 2001). These values are obtained by dividing vehicle miles traveled by fuel use. These values are used in the development of the "Inventory of U.S. Greenhouse Gas Emissions and Sinks".

<http://www.epa.gov/otaq/climate/420f05004.pdf>

Flame Weeding

Source for Equipment used by the flame weeding volunteers and information on appropriate use of propane powered weeding tools.

Flame Engineering

P.O. Box 577, W. Hwy 4

LaCrosse, Kansas 67548

Toll Free (888) 388-6724

(785) 222-2873

Fax (785) 222-3619

flame@flameengineering.com