INTEGRATED PEST MANAGEMENT PLAN

October 2016

Portland State
UNIVERSITY

A COMMITMENT TO INTEGRATED PEST MANAGEMENT

Portland State University's Pest Management Program strives to minimize the use of pesticides while ensuring balanced protection of human, horticultural and environmental health. To accomplish this, the principles of Integrated Pest Management (IPM) are utilized throughout campus.

Integrated Pest Management is designed to promote effective and economical management of pests, reduce risks to human health from pests and pest management practices, and minimize negative environmental impacts to aquatic, terrestrial, and atmospheric habitat systems.

This *Integrated Pest Management Plan* provides a comprehensive guide for pest management decisions and specific standard-based direction for implementing integrated pest management principles on PSU's campus. The plan protects and embodies Portland State's commitment to provide a safe and healthy learning environment to all members of the campus community. The Integrated Pest Management Plan was a collaborative effort involving the following departments: The Campus Sustainability Office (CSO), Facilities & Property Management (FPM), and Environmental Health & Safety (EHS).

INTRODUCTION

The purpose of this document is to provide PSU employees and contractors with an overview of integrated pest management principles and specific standard-based direction for implementing those principles.

Mission

The mission of the PSU Pest Management Program is to provide a safe and healthy learning environment that is relatively pest-free. PSU strives to minimize the use of pesticides while ensuring balanced protection of human, horticultural and environmental health.

Campus Context

PSU's 49-acre campus is located one-half mile from the western shore of the Willamette River near the downtown urban core of the City of Portland. The PSU campus, including the City of Portland South Park Blocks (mainly trees and turf) is comprised of roughly 79% impervious surfaces. PSU does not contain, nor is it directly adjacent to in-stream habitat, wetlands, or riparian areas. However, PSU campus management works to protect or improve the water quality of stormwater runoff, as it can significantly influence downstream conditions for aquatic life, such as salmon. Examples of green infrastructure on campus include buffer strips, bioswales, pervious pavement, onsite stormwater detention, flow-through planters, eco-roofs, and stormwater infiltration systems. Additionally, the campus encompasses over five million GSF within approximately 50 Buildings, 10 of which are residence halls. PSU Facilities & Property Management Department is charged with maintaining

campus landscapes and buildings to ensure a safe, healthy, and attractive campus. To best manage pests on campus, PSU staff and contracted services utilize the principles of Integrated Pest Management (IPM).

APPLICABILITY AND RESPONSIBLE PARTIES

The IPM Plan applies to pest control activities and pesticide use in all university-owned buildings and on all university-managed grounds. Recipients of this plan include all PSU staff and contractors who work to prevent, monitor, and/or treat pest problems*. Contracted landscapers and pest control providers are to abide by the management policies and field practices outlined in this Plan. PSU will include language in contracts to ensure ongoing compliance. All pesticide use, including any applications by landscape contractors, occurs within the context of the IPM program. * Excludes landscape contractors maintaining grounds on leased buildings located off-campus.

INTEGRATED PEST MANAGEMENT

Integrated Pest Management is designed to promote effective and economical management of pests, reduce risks to human health, and minimize negative environmental impacts to aquatic, terrestrial, and atmospheric habitat systems.
Integrated Pest Management is defined by the Oregon Statues (ORS 262.1), Chapter 943 as follows:

> "Integrated pest management means a coordinated decision-making and action process that uses the most appropriate pest control methods and strategies in an environmentally and economically sound manner to meet pest management objectives. The elements of integrated pest management include: (a) preventing pest problems; (b) monitoring for the presence of pests and pest damage; (c) establishing the density of pest population, which may be set at zero, that can be tolerated or corrected with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic or aesthetic threshold; (d) treating pest problems to reduce population below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical and pesticidal control methods and that shall consider human health, ecological impact, feasibility and cost effectiveness; and (e) evaluating the effects and efficacy of pest treatments."

IPM PLAN GOALS:

- Implement all pest management strategies indicated in this plan 100% of the time (measured by number of applications).
- Consider the relationship between pest biology and pest management methods.
- Consider alternative physical, mechanical, or biological control pest management methods before chemical pesticides are used.

- Improve methods for pest controls, in consideration of the impact on human health and the environment.
- Continue evaluation of the integrated pest management program.
- Continue training and education.

INTEGRATED PEST MANAGEMENT METHODOLOGY

Criteria for Choosing a Pest Management Method

An Integrated Pest Management decision at Portland State University shall consist of the following steps:

1. **IDENTIFICATION** - Careful monitoring of existing problems can help determine pest populations. Identification of the pest's life cycle, under what conditions damage occurs, and to determine if and when aesthetic threshold levels are reached. Routine site and pest inspections are performed by custodial and pest management contractors as well as internal FPM staff.
2. **INTERVENTION/ACTION THRESHOLDS** - Estimate pest populations and compare to established action thresholds. Factors considered in setting established action thresholds include economics, health and safety, public opinion, and aesthetic concerns.
3. **EVALUATION** - Selection of appropriate management tactic(s) based on an evaluation of the area, the pest organism, the impact it has on the host species, size and topography of the area, proximity to environmentally or culturally sensitive areas, cost, timing and any other relevant factors.
4. **ASSESSMENT** – Assess effectiveness of pest management.
5. **TRACKING** - Keep appropriate records.

Integrated Pest Management Strategies

Proper planning and management decisions begin the IPM process. Making decisions about pest management involve weighing the severity of the problem, a tolerance level of damage, resources available, and best management practices. Pest management strategies should include the following in this order:

1. Prevention
2. A variety of non-chemical controls
3. Pre-approved, site-appropriate pesticides that fall within the City of San Francisco's tier 3, least hazardous, category (see below).
4. More hazardous pesticides (tier 2 or 1) with universal notification only.

Often a combination of methods is used. Methods selected to manage specific pest populations are evaluated by licensed and trained professionals on a case-by-case basis.

Non-chemical methods of preventing or managing pest infestations are always preferable to chemicals. These methods include:

1. **Sanitation**: cleaning up or removing potential food and water sources for pests. The fewer food sources that are present, the fewer pests that can survive. Even something as simple as picking up a lemon that has rolled under a table can prevent a significant fruit fly infestation. A regular schedule of cleaning floors, equipment, floor drains, trash receptacles and dumpsters is the best approach to minimize food sources for pests. Water leaks should be repaired promptly, and wet mops should be hung up to dry properly
2. **Exclusion**: Sealing up cracks and holes where pests can enter is the most effective non-chemical method to prevent pests from invading a building. It is impossible, for example, to keep a building free of mouse activity if the doors do not have proper weatherstrips. It is important to keep outer doors closed or install tight-fitting screen or storm doors.
3. **Harborage Removal**: The less shelter that is available, the fewer number of pests that will be able to survive. Removing piles of debris, cutting tall weeds and eliminating cardboard boxes in storage rooms are examples of harborage removal.
4. **Harborage Denial:** If a harborage cannot be removed, e.g., cracks in interior walls where cockroaches could live, then steps should be taken to deny the pest use of that harborage. The most common procedure used to deny harborages is caulking cracks that may be present – both inside and outside.
5. **Environmental Alteration**: Changing the environmental conditions of a room or area so that pests cannot survive there can be an effective long-term strategy. For example, a wet crawlspace under a building can serve as a source of infestation for many different types of pests. Installing ventilators and vapor barriers to dry out the crawlspace prevents most pests from living under the building.
6. **Interception**: When building occupants or workers examine goods and items for pests as they are brought into the building, they often can prevent numerous introductions of pests, especially German cockroaches. This is especially important for food items, in particular bagged or boxed produce.
7. **Trapping & Monitoring**: Rodents can be effectively controlled in many situations using traps alone. Flying insects can be controlled with properly placed insect light traps in conjunction with good sanitation and exclusion practices. For insect control, traps work best for monitoring activity of insects and other arthropod pests.
8. **Vacuuming**: Physical removal of pests by vacuuming is rapidly gaining wide acceptance. This technique is especially effective for cockroach and spider control
9. **Lighting**: Exterior lights often attract large numbers of nighttime flying insects to buildings where they can enter the building. These insects also serve as food for spiders, which promotes spider infestations.
10. **Mechanical methods**: such as hand pulling, hoeing, and dead heading to prevent weeds from going to seed; cultural controls include mulching, using groundcovers and dense plantings, changes in irrigation pattern/reducing irrigation, etc. Grass clippings can be mulched and left on lawns to compost, which increases soil tilth and microbial activity at the lawn rhizoplane. This approach further reduces the need for fertilizers and irrigation while improving lawn health.

Approved Chemicals

If further monitoring, identifications, and action thresholds indicate that less risky controls are not working, additional pest control methods can be employed. **Chemical methods will be used only as a last resort and at the lowest effective rate**. Consideration of alternatives to managing pests includes "no action". When it is necessary to use pesticides as part of an IPM approach, PSU minimizes risk by careful product selection and application.

Any pesticide product that meets San Francisco's Tier 3 hazard criteria ("least hazardous") is approved for use if non-chemical methods are ineffective. Non-rodent pesticides are also considered least toxic if they exceed the Tier 3 criteria but are used in self-contained baits and placed in inaccessible locations. Rodent baits are not considered least toxic under any circumstance because of their high toxicity and should only be used if they are solid blocks placed in locked outdoor dispensers. No second-generation (single-feed) rodent baits shall be used if the building is adjacent to parkland, wild areas, or other spaces where wildlife may be unintentionally affected. See Appendix 5 or the City of San Francisco's website http://sfenvironment.org/sites/default/files/fliers/files/sfe_th_guide_to_reduced_risk_pesticide_listposted.pdf which explains the listing criteria and process, and has an updated reduced-risk pesticide list.

Additionally, PSU is committed to protecting downstream ecosystems as a certified Salmon Safe campus. Thus, use of any pesticide listed on Salmon Safe's High Hazard List (see appendix 6) is strongly discouraged and requires obtaining a variance from Salmon Safe prior to application.

Universal Notification

Use of any pesticide categorized by San Francisco as "more" or "most hazardous" (tier 2 or 1) requires universal notification of building occupants 100% of the time. Notification must occur 72 hours prior to application, except in emergency situations (see below). These chemicals should be used as infrequently as possible. Recordkeeping is necessary to document a building's ongoing compliance with the plan.

Notification will go to all potentially affected occupants in non-housing buildings via the FPM Impact Notice system and signs posted to affected areas. For residents in student housing buildings, notification will be made via mass emails to affected building occupants and posted signs to affected areas. Notification will include: the pesticide product name, active ingredient, product label signal word (e.g., "caution", "danger"), the time and location of the application, and contact information for persons seeking more information.

Any cleaning chemicals used as part of the Integrated Pest Management program must meet the requirements of the Green Cleaning Standards and Procedure.

IPM Emergency Conditions

In the event of emergency conditions, a product other than a least hazardous pesticide or self-contained non-rodent bait may be used. In these cases, universal notification is required for all building occupants within 24 hours after application. Conditions under which emergency applications are allowable are limited to situations concerning public health and safety, such as:

- An immediate food safety hazard
- Environmental hazards (such as threat of infestation/outbreak of pests to certain type of tree)
- Significant outbreaks of biting or stinging insects indoors or out
- Live pests in a high visibility area
- Extreme nuisance or disruption to tenants or the public
- Any other similar unprecedented, unforeseen event.

In the event that an emergency service is necessary, the area of concern will be closed / evacuated if needed for an adequate amount of time for proper treatment. The licensed pesticide applicator would provide further instruction regarding re-opening the area depending on the specific issue.

RUNOFF AND DRIFT MANAGEMENT STRATEGIES

As a Salmon Safe certified campus, PSU's IPM requires great care be taken to ensure that pesticide drift does not reach non-targeted areas by using appropriate equipment and methods. All chemical applications are performed in a manner that minimizes drift, runoff, or indoor air quality concerns. Pesticides are applied as indicated on label; considerations of wind drift, temperature, rainfall, and other atmospheric conditions are taken into account as follows:

- Application will occur according to the product label.
- If wind speed is above 8 mph, then application of sprays or powders is delayed.
- If temperature is above 85 F or below 55 F then application of sprays is delayed.
- If rainfall is predicted within 1-4 hours (depending on product) of application of liquids or powders or if irrigation is scheduled, then application is delayed.
- Highly targeted spray applications are equipped with a hood to prevent drift to non-target plants. Majority of spray applications occurs early in the day.
- Cutting and painting of stems with concentrated herbicide also prevents runoff and drift
- Universal notification 100% of the time to all indoor facility occupants at least 72 hours before application under normal conditions, and within 24 hours after application in emergency conditions.

RESTRICTED USE ZONE

PSU's campus does not directly contact any waterway buffer zones. However, campus management works to protect or improve the water quality of stormwater runoff, as it can significantly influence downstream conditions for aquatic life. PSU Landscaping personnel are specifically aware of primary drainage routes and pipes for storm, sanitary and combined systems in and around the campus. See Appendix 1: Storm Drainage and Pipe Locations on Campus.

PESTICIDE STORAGE, RINSATES, AND DISPOSAL

PSU standard for pesticide storage, rinsates, and disposal defines the procedure for storage, use, and disposal of pesticides in a legal and safe manner. See Appendix 2: Pesticide Storage, Rinsates, and Disposal Plan. Pesticide products will be kept in their original containers or in a labeled service container, and stored in a locked and ventilated pesticide storage container. Containers will be triple-rinsed and wrapped in paper or plastic prior to disposal. Rinsates will be collected into a disposal drum and then properly disposed of by PSU's Environmental Health and Safety Department, or will be poured into a labeled sprayer to be used in a future mix. Obsolete chemicals will be labeled as hazardous material and picked up for proper disposal by the Environmental Health & Safety Department.

LICENSING, TRAINING, AND EDUCATION

PSU is committed to maintaining a high level of expertise in our workforce. State pesticide applicator licensing assures a level of expertise and familiarity with pest management practices and pesticide materials. The continuing education requirements of state licensing also help to keep personnel up-to-date on pest management theory and practice. Therefore, PSU requires that all personnel applying pesticides on PSU-managed property or within campus buildings maintain a Certified Public Applicator license through the Oregon State Department of Agriculture. Ultimate responsibility for maintaining a valid license lies with the applicator. Information regarding state licensing requirements and status may be found at the Oregon Department of Agriculture's website at http://www.oregon.gov/ODA/PEST.

IPM PROGRAM EVALUATION

This updated plan was adopted in December 2016. PSU Facilities & Property Management Department and the Campus Sustainability Office will review the IPM Plan at a minimum once a year to make any necessary updates or changes, which may include new best management practices employed, or to address problems that may arise. An evaluation of any pesticides used will also be part of this annual review.

PERFORMANCE MEASUREMENT AND PESTICIDE TRACKING

It is required to exhaust all alternative integrated pest management practices prior to the application of non-least hazardous pesticides. Recordkeeping is necessary to document ongoing compliance with the plan. The best management practices described in this plan will be evaluated annually by the FPM Building Services Manager for compliance and outcomes will be submitted to the FPM Director for review. The percentage of least toxic applications must be calculated annually ***for each pest control category listed below*** and included in that evaluation. Percentage of least toxic applications is calculated as follows:

% of Least Toxic Applications = Number of Least Toxic Applications / (Number of Least Toxic Applications + Non-Least Toxic Applications)

- *Animal & Insect Pest Management Applications*
- *Herbicide Pest Management Applications*
- *Fungicides Pest Management Applications*

Detailed records will be maintained for all pesticide applications consistent with state requirements. Pesticide applications will be tracked by the FPM Department on the PSU Pesticide Use Tracking Form, and will be trended and reported by the Campus Sustainability Office. See Appendix 3: Pesticide Use Tracking Form.

- Each application of each pesticide is documented separately on the Pesticide Use Tracking Form by date of application.
- Each location in which each pesticide is applied on that date is to be noted on the Pesticide Use Tracking Form.
- A description of site conditions and approximate square feet treated at each location in which each pesticide is applied on that date is to be noted on the Pesticide Use Tracking Form.
- An estimate of the amount of pesticide applied on that date is to be documented.
- The application method (spray, sprinkle granules, paint on, etc.) used is to be documented.

RELEVANT DEFINITIONS

Least hazardous chemical pesticide is any pesticide product for which all active ingredients and known inert ingredients meet the least toxic Tier 3 hazard criteria under the City and County of San Francisco's hazard screening protocol. Least hazardous also applies to any pesticide product, other than rodent bait, that is applied in a self-contained, enclosed bait station placed in an inaccessible location, or applied in a gel that is neither visible nor accessible.

Universal notification means notifying building occupants not less than 72 hours before a pesticide is applied in a building or on surrounding grounds under normal conditions, and within 24 hours after application of a pesticide in emergency conditions. Use of a least hazardous pesticide or self-contained non-rodent bait does not require universal notification; all other pesticides applications do.

APPENDICES

Appendix 1: Storm Drainage Routes and Pipe Locations on Campus

Appendix 2: Pesticide Storage, Rinsates, and Disposal Plan

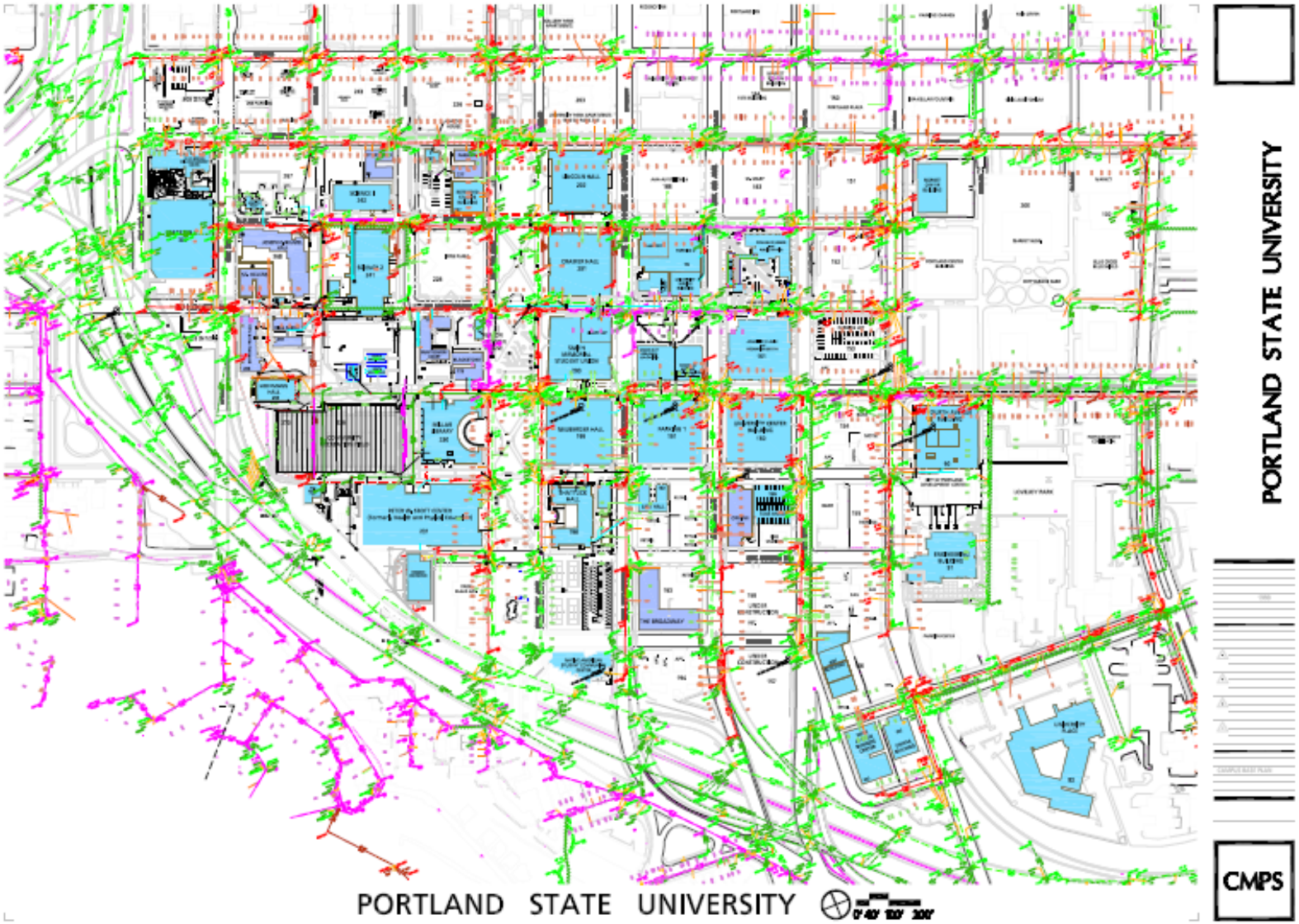
Appendix 3: Pesticide Use Tracking Form

Appendix 4: Pesticides Phased out of Use

Appendix 5: City of San Francisco 2016 Reduced Risk Pesticide List

Appendix 6: Salmon Safe High Hazard List of Pesticides

Appendix 1: Storm Drainage Routes and Pipe Locations on Campus



Appendix 2: Portland State University Pesticide Storage, Rinsates, and Disposal Plan

This plan defines the method and procedures for the storage, use and disposal of pesticide materials by PSU Landscaping Personnel applicators. It outlines methods for use of remaining pesticide solution**s** and rinses in a legal and safe manner.

Pesticides or pesticide containers shall be kept in secure and safe locations in accordance with the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (7 United States Code136 et seq.), Environmental Protection Agency regulations 40 CFR, Occupational Safety and Health Administration regulations, PSU policies and procedures, and local ordinances.

They shall be kept in a secure, well-ventilated location. Pesticides shall be safeguarded from environmental damage such as extreme temperature, photodecomposition or moisture. All pesticides in storage shall be inspected regularly and, if necessary, rotated on the shelf to assure that the oldest dated items are used first.

Pesticide solutions and rinses should be applied according to the label directions, and to legal target sites so there are no pesticides remaining. This shall be accomplished by accurately gauging the amount of pesticide needed for the job. PSU promotes the use of advance planning to minimize the number of times it is necessary to switch pesticides in spray equipment. In order to reduce the amount of excess rinsate, it is the standard of PSU to rinse equipment only at the end of the spray cycle or when changing to pesticides that are incompatible with those in the tank. It is a legal requirement to fully and legally label all tanks and sprayers containing leftover pesticides at the end of each day.

PSU shall dispose of pesticides and empty pesticide containers in accordance with all State and Federal regulations and label recommendations.

Appendix 3: Portland State University Pesticide Use Tracking Form

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PESTICIDE USE TRACKING FORM

Application Date	Site Conditions (if outdoors)	Pesticide Name & EPA#	Location Applied	Application Method	Amount Applied	Approx. Sq. Ft. Treated	Applicator Signature	Comments
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							
	Windspeed: Temp: Rainfall Predicted within: □ 1 hr □ 4 hrs □ >4 hrs							

Appendix 4: Pesticides Phased out of Use

Over the past five years, PSU identified alternatives to replace or reduce the use of the following five herbicides: 1) Atrimmec, 2) Oxadiazon (Ronstar G), 3) Dichlobenil (Casoron 4G), 4) Triclopyr and 2, 4-D (Crossbow), and 5) Glyphosate (Roundup).

PSU phased out the use of the following four pre-and post-emergent chemicals: 1) Atrimmec, 2) Oxadiazon (Ronstar G), 3) Dichlobenil (Casoron 4G), and 4) Triclopyr and 2, 4-D (Crossbow), which were used to manage invasive weed infestations and retard tree stump growth. Pesticide use on PSU grounds is currently limited to the post emergent herbicide, Glyphosate (Roundup).

PSU does not use pesticides on the Salmon Safe "High Risk" list of restricted pesticides (see Appendix 6), which pose excessive risks to aquatic ecosystems. However, if PSU were to identify a clear need for use of a pesticide on the Salmon Safe "High Risk" list, PSU will provide written documentation to Salmon Safe demonstrating the need for use of that pesticide, that no safer alternative exists, and that the method of application (such as timing, location, and amount used) represents a negligible risk to water quality and fish habitat.

PESTICIDES PHASED OUT OF USE - OUTDOORS

Product Name	*Active Ingredients*	*Application Method*	*Frequency*	*Timing and Location*	*High Risk Y/N*
PHASED OUT HERBICIDES					
Ronstar G	Oxadiazon, selective pre-emergent herbicide	Gravity drop/shaker (SpreadRite G)	Phased out, but retained on list for unusual circumstances	When temp is below 70 degrees and irrigation or rainfall expected. Locations vary, primarily shrub bed areas	No, not listed as high risk
Atrimmec	Plant growth regulator	Hand powered, low volume backpack sprayer	Phased out, as planting areas were replaced	Used primarily on hedges up to two weeks after major pruning	No, not listed as high risk
Crossbow	Triclopyr and 2, 4-D, selective post-emergent broadleaf herbicide	Hand painted on undesirable stumps	Phased out, due to threat to salmon and aquatic ecosystems	Painted directly on stump within 10 minutes of cutting	Yes, listed as high risk
Casoron 4G	Dichlobenil, selective pre and post-emergent	Gravity drop/shaker (SpreadRite G)	Phased out, due to threat to salmon and aquatic ecosystems	Used to target horsetail	Yes, listed as high risk

Appendix 5: Least Hazardous (Tier 3) Pesticide List

Source: http://sfenvironment.org/sites/default/files/fliers/files/sfe_th_d.rrpl_2016_110915.pdf

Guide to list and hazard review process: http://sfenvironment.org/sites/default/files/fliers/files/sfe_th_d.rrpl_2016_110915.pdf

Product Name	Type	Ingredients	Pesticide Hazard Tier
Actinovate	Fungicide	Streptomyces lydicus WYEC 108	Least hazardous (Tier III)
Fosphite Fungicide	Fungicide	Potassium phosphate	Least hazardous (Tier III)
Advion Ant Bait Arena (Dupont)	Insecticide	Indoxacarb 0.1%	Least hazardous (Tier III)
Advion Ant Gel (Dupont)	Insecticide	Indoxacarb 0.5%	Least hazardous (Tier III)
Advion Cockroach Bait Arena (Dupont)	Insecticide	Indoxacarb 0.5%	Least hazardous (Tier III)
Advion Cockroach Gel Bait (Dupont)	Insecticide	Indoxacarb 0.6%	Least hazardous (Tier III)
Agri-Fos Systemic Fungicide	Fungicide	Potassium phosphite 45.8%	Least hazardous (Tier III)
Bacillus thuringiensis insecticides (excluding mosquito control)	Insecticide	Bacillus thuringiensis (various subspp.)	Least hazardous (Tier III)
BestYet Cedarcide	Insecticide	Cedarwood oil, amorphous silica	Least hazardous (Tier III)
Eco Exempt/Essentria Jet Wasp and Hornet Killer	Insecticide	2-phenethyl proprionate 2%, rosemary oil 3%	Least hazardous (Tier III)
Cimexa Insecticide Dust	Insecticide	Amorphous silica gel 100%	Least hazardous (Tier III)
Essentria IC3	Insecticide	Rosemary oil 10%, geraniol 5%, peppermint oil 2%, wintergreen oil, white mineral oil, vanillin, polyglyceryl oleate	Least hazardous (Tier III)
Gentrol Point Source Roach Control Device	Insecticide	Hydroprene 96%	Least hazardous (Tier III)
M-pede Insecticide/Fungicide	Insecticide	Potash soap 49%	Least hazardous (Tier III)
OhYeah!	Insecticide	Sodium lauryl sulfate	Least hazardous (Tier III)
Organocide	Insecticide	Sesame oil 5%	Least hazardous (Tier III)
Terro Ant Killer II, Terro Ant Killer	Insecticide	Sodium tetraborate decahydrate	Least hazardous (Tier III)

II Liquid Ant Baits, Terro-PCO Liquid Ant Bait		5.4%	
Bond Spreader Sticker	Adjuvant	Synthetic carboxylated latex 50%, primary aliphatic oxyalkylated alcohol 10%	Least hazardous (Tier III)
CMR Silicone Surfactant	Adjuvant	Polymethylsiloxane, nonionic	Least hazardous (Tier III)
Competitor	Adjuvant	Ethyl oleate	Least hazardous (Tier III)
Pentrabark	Adjuvant	Polyalkyleneoxide modified heptamethyltrisiloxane	Least hazardous (Tier III)
Critter Ridder	Mammal repellant	Oil of black pepper 0.48%	Least hazardous (Tier III)
Detour	Mammal repellant	White pepper 3%, white mineral oil 87%, silica 10%	Least hazardous (Tier III)
Shake-Away Coyote Urine Repellant Granules	Mammal repellant	Coyote urine 5%, limestone 95%	Least hazardous (Tier III)
Sluggo Slug and Snail Bait	Molluscicide	Phosphoric acid, iron(3+) salt (1:1) 1%	Least hazardous (Tier III)
Mosquito control - microbial	Mosquito control - microbial	Bacillus thuringiensis (Berliner or Israelensis) or Bacillus sphaericus	Least hazardous (Tier III)
Mosquito control products - IGRs	Mosquito control - IGRs	S-Methoprene (5026	Least hazardous (Tier III)

Appendix 6: Salmon Safe High Hazard List

COMMONLY USED PESTICIDES THAT POSE HIGH RISK TO SALMON, OTHER FISH AND AQUATIC LIFE IN URBAN STREAMS			
1,3-dichloropropene	Diazinon	Imidacloprid	Pendimenthalin
2,4-D	Dicamba	Iprodione	Permethrin
Abamectin	Dichlobenil	Linuron	Phorate
Acephate	Diflubenzuron	Malathion	Phosmet
Alachlor	Dimethoate	Mancozeb/Penncozeb	Prometryn
Atrazine	Disulfoton	Methamidophos	Propargite
Azinphos-methyl	Diuron	Methidathion	Propiconazole
Bensulide	Emamectin Benzoate	Methomyl	Pyraclostrobin
Bifenthrin	Endosulfan Sulfate	Methyl Parathion	Quintozene
Bromoxynil	Esfenvalerate	Metolachlor	Simazine
Carbaryl	Ethalfluralin	Metribuzin	Tebuthiuron
Carbofuran	Ethoprop	Naled	Terbufos
Chloropicrin	Extoxazole	Norflurazon	Thiophanate-methyl
Chlorothalonil	Fenamiphos	Nuvaluron	Thiram
Chlorpyrifos[1]	Fenbutatin-Oxide	Oryzalin	Triallate
Copper Sulfate[2]	Fenpropathrin	Oxyfluorfen	Triclopyr
Cyhalothrin	Fenpyroximate	Parathion	Trifluralin
Cypermethrin	Flumioxazin	Pebulate	

[1]Chloropyrifos is not allowed for use at Salmon-Safe certified projects.

[2]Salmon-Safe restrictions apply to any copper-containing pesticide including copper hydroxide, copper ammonium hydroxide, copper carbonate, and copper oxide, and others.

***PENDING REVIEW.** This list is based on EPA hazard level for fish and fish habitat. It is revised as pesticide registrations are updated and as more environmental data becomes available.*