

WHATCOM COUNTY
INTEGRATED PEST MANAGEMENT
AND NUTRIENT CONTROL PLAN FOR
PARKS AND OPEN SPACES

Prepared for
Whatcom County, Washington
July 2012

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WHATCOM COUNTY INTEGRATED PEST MANAGEMENT AND NUTRIENT CONTROL PLAN FOR PARKS AND OPEN SPACES

1. Plan Purpose

The Whatcom County (County) Integrated Pest Management and Nutrient Control Plan (IPM) is intended to achieve the following objectives:

- Protect the health, safety, and welfare of the community
- Protect water resources and help meet the requirements of the Western Washington Phase II Municipal Stormwater Permit, Section S5.C5.g
- Provide efficient, cost-effective maintenance of the County's parks, facilities, and other resources through the use of an IPM strategy
- Protect environmentally valuable areas such as wetlands, riparian areas, and aquatic and terrestrial wildlife habitat
- Design new and renovate existing landscape areas that suit site conditions while encouraging sustainable maintenance practices

2. Integrated Pest Management Principles

IPM is a series of pest management evaluations, decisions, and controls rather than a single pest control method. In practicing IPM, County staff who are aware of and responsible for managing the potential for pest infestation follow a six-tiered approach, which is summarized below.

2.1 Identify Pests

Correctly identify problem pests and understand their life cycles.

2.2 Set Action Thresholds

Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean that control is needed. Determining the level at which pests will threaten public health, safety, resources, or facilities is critical in guiding pest control decisions.

2.3 Monitor and Identify Pests

IPM programs monitor for pests and identify them accurately so that appropriate control decisions can be made in conjunction with established action thresholds. Not all insects, weeds, and other organisms require control. Many organisms are innocuous, some are beneficial, and some populations are not significant enough to pose a potential threat. Monitoring and identification reduces the possibility that pesticides will be used when not needed or that the wrong kind of pesticide will be used.

2.4 Prevent Pest Habitat and Pest Introduction

IPM programs work to manage parks, facilities, and other resources so as to minimize the potential for pests posing a threat. This management approach may mean selecting pest-resistant plant varieties and planting pest-free rootstock. These control methods can be very efficient and cost-effective while presenting little to no risk to people or the environment.

2.5 Control Pests

Pest monitoring and identification efforts together with established action thresholds may indicate that pest control is required, particularly where preventive methods are no longer effective or available. IPM programs then evaluate the available proper control method both for effectiveness and risk. Effective, less risky pest controls are preferred. Highly targeted or pest-specific chemicals (such as pheromones to disrupt mating) or mechanical controls (such as trapping, weeding, or screening) are preferred to more general pesticide applications. If further monitoring, identifications, and action thresholds indicate that less risky controls are not working or are not a viable option, then additional pest control methods would be employed (such as targeted spraying of pesticides). Broadcast spraying of non-specific pesticides is a last resort.

2.6 Evaluate and Record Control Method Effectiveness

Evaluate and record the effectiveness of the employed control method and modify maintenance practices to support landscape recovery and prevent recurrence of pests beyond action thresholds.

3. Pest Controls

The IPM decision-making process is used to determine if, where, when, and how pest problems will be managed. The IPM program includes all potential pest control strategies, but *focuses on non-chemical controls whenever possible*, in order to support a sustainable environment. Sound horticultural practices should be used to control pests. It is important to also apply sound principles to chemical fertilizer application decisions and to other chemical applications—use minimum quantities, follow product directions, and comply with all regulatory requirements.

Four pest control methods, listed below in order of preference, may be employed with the IPM program.

3.1 Cultural Control

Cultural control involves using sound horticultural practices to optimize plant health and to suppress insects, disease, and weed growth. Other cultural controls include site-appropriate design and the use of disease or drought-resistant plants.

3.2 Mechanical Control

Mechanical control involves using a variety of pest removal techniques, tools, and equipment for eliminating pests.

3.3 Biological Control

Biological control involves using agents that act as predators or parasites of pest species and using other beneficial organisms that improve plant health by enhancing soil quality.

3.4 Chemical Control

Chemical control involves applying various products such as herbicides, insecticides, fungicides, fertilizers, or other chemical compounds to a target pest as a means of control. Whenever pesticides or fertilizers are used, they must be applied according to the directions on the pesticide container label. Due to constantly changing labels, laws, and regulations, it is important to verify that the products used are appropriate for the intended application.

The Washington State Department of Agriculture sets the overall policy for pesticide use in the state of Washington. The approved chemical list can be seen on the department's Web site at www.agr.wa.gov. All pesticide use procedures shall conform to the requirements of Revised Code of Washington (RCW) Chapter 17.21 and Washington Administrative Code (WAC) Chapter 16-228 (Appendix IV-D R.7).

The Washington Department of Ecology (Ecology) requires a special permit for all aquatic herbicide applications. This permit allows herbicide control for all listed noxious weeds within an aquatic environment and monitors impact levels on non-target plants. The following link contains more information: http://www.ecy.wa.gov/Programs/wq/pesticides/final_pesticide_permits/noxious/noxious_index.html

The Stormwater Management Manual for Western Washington states that a pesticide use plan include the following information at a minimum:

- A list of selected pesticides and their specific uses
- Brands, formulations, application methods, and quantities to be used
- Equipment use and maintenance procedures
- Safety, storage, and disposal methods
- Monitoring, record-keeping, and public notice procedures

The Stormwater Management Manual for Western Washington also states that pesticide applicators should:

- Mix the pesticides and clean the application equipment in an area where accidental spills will not enter surface waters or groundwaters, and will not contaminate the soil
- Store pesticides in enclosed areas or in covered impervious containment
- Ensure that pesticide-contaminated stormwater or spills/leaks of pesticides are not discharged to storm drains
- Ensure that pesticide-contaminated paved areas are not hosed down to a storm drain or conveyance ditch
- Store and maintain appropriate spill cleanup materials in a location known to all near the storage area
- Clean up any spilled pesticides and ensure that the pesticide-contaminated waste materials are kept in designated covered and contained areas
- Ensure that the pesticide application equipment is capable of immediate shutoff in the event of an emergency
- Do not spray pesticides within 100 feet of open waters including wetlands, ponds, and streams, sloughs, and any drainage ditch or channel that leads to open water except when approved by Ecology or the local jurisdiction
- Flag all sensitive areas including wells, creeks, and wetlands prior to spraying
- Complete public posting of the area to be sprayed prior to the application as required by the local government or by Ecology
- Spray applications only during weather conditions as specified in the label directions
- Do not apply during rain or immediately before expected rain

- Do not dispose of collected vegetation into waterways or storm drainage systems
- Conduct mulch-mowing whenever practicable
- Dispose of grass clippings, leaves, sticks, or other collected vegetation by composting, if feasible

4. IPM for Natural Areas, Forested Areas, and Stormwater Facilities

Generally, the use of chemical products within 100 feet of a watercourse should be avoided in favor of an alternative control method whenever possible. If a pesticide or herbicide must be applied within the 100-foot zone, only products registered for use near water bodies should be used, and great care must be taken to ensure that the product does not migrate into the watercourse either through drift, overland flow, or groundwater flow. All sensitive areas including wells, creeks, and wetlands must be flagged prior to spraying. Weather conditions must be monitored carefully to avoid applying a chemical near a watercourse immediately before forecasted rains. Soil conditions and site topography must be studied to determine whether a chemical application is appropriate and to determine the appropriate timing of any chemical application.

4.1 Pest Tolerance Thresholds

For all natural and sensitive areas, the following guidelines should be observed:

- Invasive plants are generally not acceptable. Invasive plants should be controlled in conjunction with natural resource enhancement efforts in these environments as resources permit and where control can be practically achieved.
- Noxious weeds are generally not acceptable and should be controlled when found in conformance with state of Washington requirements for noxious weeds. The following links contain information for noxious weed boards in Washington State:
 - <http://apps.leg.wa.gov/Rcw/default.aspx?Cite=17.10>
 - http://www.nwcb.wa.gov/nwcb_nox.htm
 - <http://www.skagitcounty.net/Common/asp/default.asp?d=Noxiousweeds&c=General&P=main.htm>
- Insect pests that pose a risk to the public (such as hornets) or to a resource (such as gypsy moths) should be controlled.
- Plant diseases will generally be tolerated unless control is necessary to ensure the health of particularly valuable assets or if they pose an unacceptable risk to the public.

4.2 Controls

Herbicide use in any natural environment must be carefully considered. Herbicides should be used for weed control in natural areas only when necessary and when other control measures have been unsuccessful. For wetlands or water environments, only approved wetland herbicides should be used.

When necessary, herbicide use practices are as follows:

- Cut-and-stem treatment (daubing or painting) is the preferred choice for natural area management.
- If possible, remove existing growth manually or mechanically. Wait for new growth to become established, and then treat with the appropriate herbicide.

5. IPM for Turf Areas

Whatcom County maintains a variety of turf types including park lawn area, athletic fields, and other turf types. Different pest issues may affect each turf type and pest management practices may vary accordingly.

5.1 Pest Tolerance Thresholds

The following summarizes the pest tolerance thresholds for various turf areas:

- Some levels of weed, insect, and disease pests are tolerated in general park lawn areas.
- Pests in highly maintained turf such as athletic fields are generally controlled through good turf cultural practices.

5.2 Controls

The following section summarizes controls for broadleaf, insects, disease, and grass for various turf areas.

5.2.1 Broadleaf Weed Control

Weeds in turf are generally tolerated to some extent. When control is necessary, the primary method is through the following cultural practices:

- Careful monitoring of watering practices
- Fertilization
- Aeration
- Top-dressing
- Over-seeding

Through the above cultural practices, park turf is made healthier and better able to compete with various broadleaf weeds. Chemical weed control should be used only as a last resort for controlling particularly difficult weeds in high-visibility turf areas. In controlling broadleaf weeds, the following guidelines should be observed:

- The least toxic, least residual pesticide should be used for spot treatments.
- General broadcast treatments should be avoided and used only when other control methods fail.
- Timing of such applications should be made to avoid contact with the public to the maximum extent possible.
- Sites that have been treated should be posted.

5.2.2 Insect Control

The insect pest of concern for County-managed turf is the European crane fly. Chemical control is to be used only in limited circumstances in high-visibility/high-use park turf areas and according to the following guidelines:

- Chemical applications should be spot treatments directed specifically at the turf areas containing the pest.
- The preferred initial choice for application in high-use areas is the safest, least toxic product available.

5.2.3 Disease Control

Disease in general park turf is typically tolerated and not actively controlled; the following guidelines should be observed:

- In high-use/high-visibility park turf areas, disease should be controlled by performing sound turf cultural practices.
- Pesticides may be used as a last resort to control disease in park turf areas.

5.2.4 Grass Trimming Control

The control of grass growing along fence lines and around trees, bollards, posts, and other landscape features may be necessary. Careful employment of grass control techniques is especially important around trees where impacts from mower line trimmers and other damage can lead to tree loss. The following are acceptable grass trimming management practices:

- Grass is carefully trimmed using gas-powered string trimmers or push-type lawn mowers.
- Herbicide applications are performed periodically to provide pre-emergent control of weed and grass seed not yet germinated.
- Herbicide applications to control existing weeds and grass should only be used minimally.
- Concrete mow strips are sometimes a good alternative to herbicide application or grass trimming.

6. IPM for Trails

Whatcom County maintains a number of trails that may be affected by different pest issues, and pest management practices may vary accordingly.

6.1 Pest Tolerance Thresholds

The following summarizes the pest tolerance thresholds for trails:

- Invasive plants should be controlled in conjunction with ecosystem restoration efforts on any park trail as resources permit.
- Noxious weeds should be controlled, when found, according to state of Washington requirements.
- Weeds are generally found on trails and require control only when beginning to compromise trail function.
- Insect pests that pose a risk to the public (e.g., hornets) should be controlled.

6.2 Pest Management Strategies

The following section summarizes pest management strategies for trails.

6.2.1 Weed Control

Weeds on trails are generally tolerated until they begin to interfere with trail function. When control is necessary, the primary method is increasing mulch on, or re-surfacing of, the trail surface. Chemical weed control is often not necessary on trail surfaces, but should be used only as a last resort for controlling particularly difficult weeds. In the cases where chemical weed control is indicated, the following guidelines should be observed:

- The least toxic, least residual herbicide should be used for spot treatments.
- General broadcast treatments should be avoided.

- Timing of such applications should be made to avoid contact with the public to the maximum extent possible.
- Sites that have been treated should be posted.

6.2.2 Insect Control

Only insects that can cause a health risk (such as wasps and hornets) are controlled on trails. When insect control on trails is necessary, chemical control with an approved insecticide is acceptable and only the individual nests should be treated.

7. IPM for Trees

Park trees are aesthetically pleasing, contribute to wildlife habitat, provide shade and shelter from the weather, and help clean the air of pollutants. Because trees are often very tall, accessing and managing pests and disease may present unique challenges.

7.1 Pest Tolerance Thresholds

The following summarizes the pest tolerance thresholds for areas with trees:

- Some insect and disease pests in trees are to be expected.
- Insect or disease pests in selected, high-value specimen trees may require control measures.

7.2 Physical Tree Damage Control

Tree loss damage most often occurs when construction equipment, mowing equipment, or string trimmers repeatedly strike trees. Damaged bark may result in tree loss. Damage may be controlled by observing the following guidelines:

- Removing turf from around the tree base to create tree mulch rings 3 to 4 feet in diameter can substantially reduce damage caused by mowers and trimmers.
- With tree mulch rings, pruning should be conducted for tree health reasons and for hazard reduction in conformance with the International Society of Arboriculture standards.

7.3 Insect Control

Conditions may make it less desirable to attempt controlling insect pests in large trees. Aerial spray equipment often involves a high probability of the applied pesticide leaving the area due to wind drift. When insect pests are to be controlled in trees, the following measures should be used:

- Trees highly susceptible to specific insect pests may be removed from the landscape and replaced with resistant species.
- The portion of the tree affected by the insect (such as tent caterpillars) can be physically removed, eliminating the pest.
- An insecticide may be applied to control a specific insect pest only in certain situations. Such situations include pests on specimen-quality trees, in high-visibility locations, or where the presence of the pest threatens the life of the tree. When pesticide applications are made, product drift should be controlled.
- Injection technology may allow for systemic control of certain insect pests with minimal or no impact to human or environmental health.

7.4 Disease Control

Tree diseases may lead to a tree becoming a hazard to the public or the surrounding environment. The following control measures may be appropriate under certain conditions:

- Trees susceptible to particular diseases may be removed from the landscape and replaced with disease-resistant varieties.
- When possible, parts of trees affected by disease should be pruned out and properly disposed of to stop the spread of disease within the tree and to adjacent trees.
- An appropriate fungicide may be applied to control a specific disease pathogen only in certain cases. These cases include specimen-quality trees in high-visibility park locations where the presence of the disease compromises public safety or threatens the life of the tree. Pesticide applications should not be made unless the potential for product drift can be controlled.
- Injection technology may allow for systemic control of certain disease in trees pests with minimal or no impact to human or environmental health.

8. IPM for Plant Beds

Plant beds are defined as non-turf planted areas that include woody plant material such as shrubs, trees, and ground covers. This category also includes floral color displays containing herbaceous plants such as perennials, annuals, and bulbs.

The most serious pest management issue in plant beds is weed control. If not controlled, weeds not only make a plant bed look unkempt but, more importantly, can out-compete desirable landscape plants resulting in a loss of assets.

8.1 Pest Tolerance Thresholds

The following summarizes the pest tolerance thresholds for plant beds:

- In general, weeds are not tolerated in park plant beds.
- Insect pests are tolerated unless they pose a threat to humans.
- Diseased plants are not tolerated and are usually removed.

8.2 Weed Control

The following summarizes weed control guidelines for plant beds:

- Weeds are controlled by hand pulling, or by mechanical methods in larger plant beds.
- Plant beds may be mulched after planting to suppress new weed growth.
- Use of landscape fabric can be used.
- Herbicides can be sprayed, if necessary.

8.3 Disease Control

The following summarizes the disease control guidelines for plant beds:

- Diseased plants should be hand-pulled from plant beds and discarded appropriately.
- Disease-resistant plants should be planted in all park plant beds, whenever possible.

9. IPM for Specific Pests

Certain specific pests require special management consideration. These pests include blackberries, English ivy, horsetail, Japanese knotweed, mice and rats, nuisance wildlife, Scotch broom, slugs, vector-borne disease, yellow jackets, hornets, and wasps.

9.1 Blackberries

Effective mechanical control of blackberries may be difficult by itself. Combined with chemical control measures and replanting of the site, effective control can be maintained.

Chemical applications should be limited to the area of infestation. Control measures should include re-vegetating the site with desirable plant species.

9.2 English Ivy

Ivy is difficult to control or eradicate. Manual or mechanical control is somewhat effective though time-consuming. A combination of mechanical and chemical control may be more effective and spread can be kept to a minimum, with continuous control measures. Chemical applications should be kept to the area of infestation.

9.3 Horsetail

Horsetail may be almost impossible to control manually or mechanically. Horsetail can be controlled with herbicides. Horsetail is an indication of high water content in soil, so any use of herbicides should be well thought-out and carefully timed to avoid contamination beyond the application area. Chemical application should be contained to the area of infestation.

9.4 Japanese Knotweed

Knotweeds are a habitat-degrading problem along riparian corridors in western Washington and are very difficult to control because they have an extensive rhizome system and the ability to resprout. It is generally not considered possible to eradicate knotweed species from Washington, but it may be possible to eliminate them from high-quality riparian areas. Control methods in order of preference include prevention, mechanical, cultural, and chemical controls. A combination of mechanical and chemical control may be more effective. Chemical applications should be kept to the area of infestation.

9.5 Rats and Mice

Rats and mice may pose a human health risk when present and should be controlled in given situations. Mouse and rat control is not currently a major pest control issue in parks facilities, but increased control measures may be indicated in the future. The common method of control is baiting with an approved rat or mouse bait/trap. Extreme caution must be taken to place bait/traps in locations where people and domestic animals cannot access them. Potential effects of bait on predators or other wildlife should be considered.

9.6 Nuisance Wildlife

Beavers, coyotes, moles, mountain beavers, opossums, raccoons, waterfowl, and other species can be destructive to park lands and natural areas when their activities are excessive. Generally, interference with wildlife is undesirable. If control of wildlife is deemed necessary, the City will work with the state agency (Department of Wildlife) to formulate a control solution.

9.7 Scotch Broom

Broom can thrive on disturbed sites. It may be difficult to control, and spreads rapidly. The seeds and flowers are toxic, making it a high priority for eradication. Manual control can have some effect, but must be done at the proper time of year. Chemical control can also be effective, but requires follow-up management techniques until full eradication occurs. Chemical applications should be kept to the area of infestation.

9.8 Slugs

Slugs can have a significant impact on park floral beds and other vegetation. Approved control strategies include manual control and careful use of chemical control products. One non-toxic chemical that is found to work is iron phosphate, which is biodegradable and, in appropriate concentrations, healthy for garden soil.

9.9 Vector-Borne Disease

Vector-borne diseases are rarely an issue in the Pacific Northwest. The most significant such disease at this time is the mosquito-borne disease, West Nile Virus. Complete control of mosquito infestations is nearly impossible, but cultural controls can have some effect, such as removing any standing or stagnant water. Larvicides may also be used to control mosquito infestations if it is determined that public health concerns warrant their use. West Nile Virus control efforts should be coordinated with public health authorities.

9.10 Yellow Jackets, Hornets, and Wasps

Control is typically through use of an approved insecticide. Only individual nests are treated and only if the nest poses an imminent risk to humans using park facilities.

10. Nutrient Control

It is important to apply sound principles to chemical fertilizer application decisions and to other chemical applications in order to minimize the potential impacts of nutrient loading on water resources. Sound practices include minimizing application quantities, following product directions, and complying with all regulatory requirements.

The U.S. Environmental Protection Agency (EPA) has also identified nutrient criteria development as a national priority and asked states to develop nutrient criteria development plans. Ecology has subsequently developed a nutrient control plan. Washington's nutrient control program combines prevention, trigger criteria, and comprehensive cleanup strategies to ensure that the beneficial uses of the state's waters remain protected from the effects of excess nutrients. Plan program elements are described below.

10.1 Prevention

Statewide restrictions on phosphorus concentrations in detergents, nutrient control plans for dairies, and an antidegradation program for new or expanding wastewater dischargers form the backbone of the state's prevention program.

10.2 Trigger Criteria

Target criteria for phosphorus in lakes, dissolved oxygen, and pH criteria that are very sensitive to changes in nutrients, and narrative prohibitions on excess algal growth are used together to identify where nutrients need to be controlled to prevent unhealthy conditions.

10.3 Cleanup Programs

When water quality criteria are not met and the beneficial uses of a water body are impacted due to excess nutrients, comprehensive water body cleanup plans for specific water bodies will be developed to establish specific control objectives for all human sources of nutrients in the watershed.

Potential implementation of total maximum daily loads (TMDLs) for phosphorus and fecal coliform are being explored for the Lake Whatcom area. Implementation of a TMDL for either parameter would potentially impact decisions made under this IPM for activities that could potentially contribute nutrients to the Lake Whatcom watershed.

11. Definitions

Material Safety Data Sheets: MSDSs are prepared by manufacturers of chemical products to relay the necessary safety and protective information to users about the said chemical compounds.

Pesticide: Any material including agricultural chemicals, herbicides, insecticides and fungicides, or biological agents applied to a target pest as a control measure.

Pest: The word “pest” has been broadly defined in this document to include “injurious” insect species, plant pathogens, noxious or invasive vegetation, vertebrate animals such as rodents, structural pests, or any other factor that creates an unhealthy environment for landscapes and structures.

Plant beds: Non-turf planted areas that include woody plant material such as shrubs, trees, and ground covers and may also include floral color displays containing herbaceous plants such as perennials, annuals, and bulbs.

Threshold: The term “threshold” refers to the point at which pest injury can no longer be tolerated without compromising human health or the health or aesthetic value of a plant, ecosystem, or other assets of value. Once a threshold is being approached, some control measure may be necessary to suppress pest activity to acceptable levels.

12. References and Further Information

In general, the Stormwater Management Manual for Western Washington, Volume IV, Source Control BMPs is a good source for information on pollution reducing measures for municipal operations.

This Integrated Pest Management and Nutrient Control Plan for Parks and Open Spaces was developed relying on information from the following sources:

2011/2012 Integrated Roadside Vegetation Management Plan, Whatcom County Public Works Department, Maintenance and Operations Division

United States Environmental Protection Agency, Integrated Pest Management Principles
<http://www.epa.gov/opp00001/factsheets/ipm.htm>

Washington State University Extension, Hortsense: Home gardener fact sheets for managing plant problems with IPM or Integrated Pest Management
<http://pep.wsu.edu/hortsense/>

Shaw, Andy; Skagit County Department of Public Works Maintenance and Operations Division:
Roadside Vegetation Management Objectives

Snohomish County, NPDES Integrated Pest Management Plan for Sites with Drainage Facilities Owned or Operated by the County’s Surface Water Management Division

City of Bellevue Parks and Community Services, Integrated Pest Management Plan

Washington State Noxious Weed Control Board, Japanese Knotweed Plant Profile
<http://www.nwcb.wa.gov/detail.asp?weed=103>

Washington State Department of Ecology, Stormwater Management Manual for Western Washington,
Volume IV, Source Control BMPs

Washington State Department of Ecology, Nutrient Criteria Development in Washington State:
Phosphorus, May 2004
<http://www.ecy.wa.gov/biblio/0410033.html>

Washington State Department of Ecology, Summary of Washington's Nutrient Control Plan
<http://www.ecy.wa.gov/programs/wq/swqs/nutrient.html>

Washington State Department of Ecology, Lake Whatcom Multi-parameter Water Quality Improvement
Project
<http://www.ecy.wa.gov/programs/wq/tmdl/LkWhatcom/LkWhatcomTMDL.html>