Integrated Pest Management (IPM) Policy and Operations Manual

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1. Purpose of this document

The purpose of this document is to describe the City of Eugene Parks and Open Space (POS) Division's program on Integrated Pest Management (IPM) and the operational procedures that staff uses to practice IPM on POS-managed lands.

POS manages a very diverse portfolio of land and infrastructure, including land already developed as parks, lands planned for future park development, trees, medians, and public stormwater facilities in the right-of-way, and park natural areas. Due to this difference in the planned park use at different sites, there is a wide range of park management goals across the park system. This document is organized to provide meaningful procedures to assist staff with making well-informed management decisions based on the uses and goals at different types of sites. Specifically, Section 3 of this document is organized by specific site types that have similar uses and management objectives. For example, Section 3.1 addresses Prairies and Savannas, Section 3.2 addresses Forests and Woodlands, Section 3.8 addresses Landscape Beds, and Section 3.14 addresses Softball Infields, etc.

Yet even within a given type of site, there are individual locations that differ in quality, uses, or management objectives. Therefore, specific sites within a category are assigned a *maintenance mode classification* (see Section 1.2 below). For each maintenance mode within a site type, specific IPM procedures are described that guide how POS staff implements IPM.

This document will be updated periodically, as new information and techniques become available and as we learn more about the efficacy of specific prevention and control techniques.

1.1. What is a pest?

Since the focus of this document is an integrated method for managing pests, it is worthwhile to define the term "pest". In this context, a pest is an organism which has characteristics that are regarded by humans as injurious or unwanted. Pests can include members from many taxonomic groups, including animals, plants, fungi, and viruses.

Organisms are usually considered pests because they can cause damage to agriculture, forestry, native ecosystems, infrastructure, human safety, or human health. For example, codling moths damage apples, gypsy moths damage many species of native forest trees, and reed canary grass displaces a wide diversity of native plants in wetland habitats. Pests that negatively impact human health include rats and fleas which carry the plague or mosquitoes which are vectors for malaria and West Nile virus.

It is possible for a species to be a pest in one setting but beneficial or domesticated in another. For example, some plants that are used in home landscapes are highly desirable in a residential garden. However, this same species may be an invasive plant in nearby native ecosystems, and therefore is considered a pest. Similarly, many stinging insects (e.g., bees and wasps) perform many beneficial ecological functions, including pollinating crops, landscape plants, and native

plants. However, a population of a stinging insect next to a playground may be considered a pest.

Pest plants are frequently referred to as "weeds". A weed is a plant growing in an undesired place and is considered by the user of the term to be a nuisance. The term weed can be applied to plants growing in many different settings, including gardens, lawns, agricultural areas, hard surfaces, developed parks, and natural areas.

In some settings even native plants can be considered undesirable, such as prairie restoration projects where woody shrubs and trees would conflict with the desired site characteristics. Oak woodlands are another example where the presence of native hardwoods or conifers may be undesirable. Overgrown areas can pose a risk of catastrophic wildfire and reducing woody vegetation is the focus of fuels reduction efforts for public safety and habitat restoration purposes. Poison oak is a native plant, but in some locations where the likelihood of public exposure is high, staff may elect to control it in the interest of public safety.

Weeds may be unwanted for a number of reasons: they might be unsightly, degrade water quality, negatively affect ecosystem functionality, crowd out or restrict light to more desirable plants, or use limited nutrients from the soil. They can harbor and spread plant pathogens that infect and degrade the quality of crop or horticultural plants. Some weeds are a nuisance because they have thorns or prickles, some have chemicals that cause skin irritation (e.g., poison oak) or are hazardous if eaten, or have parts that come off and attach to fur or clothes.

In this document, there are procedures outlined to manage many different kinds of pests, including plants (weeds), animals, viruses, and fungi.

1.2. How to use the document

The primary audience for this document is the staff within the Parks and Open Space Division who plan and implement IPM on POS-managed lands.

To most effectively use this document, the following four steps are recommended:

a. Review the Table of Contents to understand the overall organization of the document.
b. Read and understand all the information in Section 1 of the document.
c. Read and understand the IPM policy in Section 2.
d. Identify which subsections of Section 3 apply to you and your work team. For each of those subsections, implement the procedures described in each subsection.

The bulk of the content of this document is in Section 3, IPM Operations Guidelines for Site Types. Each subsection within Section 3 describes the specific IPM operations guidelines for specific types of sites (e.g., prairies and savannas, playgrounds, ballfields) within the Parks and Open Space system. Within a given type of site, there are individual locations that differ in quality, uses, or management objectives. Therefore, specific sites within a category are assigned a *maintenance mode classification*. In our Parks and Open Space system, we have a Maintenance Mode system for natural areas and a Maintenance Service Level for developed parks, stormwater

facilities, right-of-way and medians. These are described below.

1.2.1. What is a Maintenance Mode?

In this context a "mode" is the standard to which a park natural area is maintained. In the City of Eugene Parks and Open Space Division's system, natural areas are classified alphabetically (Mode A – Mode D). The mode scale goes from most intensive management (Mode A) to least intensive management (Mode D). The maintenance modes assigned to each specific parkland area dictate the threshold (tolerance) levels for pest species on these sites.

1.2.2. Maintenance Modes in Natural Areas

The intent of the maintenance mode system for Natural Areas is to keep *currently high-quality natural areas* in a high-quality state. Accordingly, we have less tolerance for weed species in natural areas that have relatively intact, diverse native plant communities. Under this maintenance mode system, there are four maintenance modes for POS natural areas.

Mode A
Mode A areas are active or established wetland mitigation bank sites. Because of state and federal laws regulating wetlands, wetland mitigation sites are held to very high standards for the percent cover of native and weed species. As a result, weed tolerances for active Mode A areas are the lowest of those managed by POS.

Mode B
Mode B areas are the highest-quality natural resource areas in the City parkland system other than wetland mitigation sites. These areas often contain populations of rare or uncommon native plants. Another factor separating Mode B areas from others is the presence of extremely diverse habitats. An area with many different types of common native plants or exceptionally large or robust populations of a native plant or habitat type could also be designated a Mode B area.

Mode C
Mode C areas are average-quality natural areas. These areas typically contain some native species, but many non-native species also typically exist in the habitat area.

Mode D
Mode D areas are lower-quality natural resource areas. These areas are typically dominated by non-native species. There may be few or no native species and the habitat value may only be structural or marginal.

1.2.3. Maintenance Service Levels in Developed Parks

Park Operations employs a set of Park Maintenance Standards for developed parks. The Standards provide detail on the maintenance service level for park assets and describes to what degree of servicing they are expected to receive. The service level for any asset is dependent on a variety of factors including, but not limited to, the designed use or aesthetic quality of a given park or area within a park.

Specialty Landscapes/Turf
The target for these areas is high-quality aesthetics or functionality, and these areas generally receive the highest service level of maintenance. These areas may include landscape or turf areas in highly visible sites associated with special use facilities, community parks, metropolitan parks, floral gardens and sports fields.

Landscapes/Turf
The target for these areas is an acceptable-quality aesthetic or functionality. These areas receive a moderate service level of maintenance and are associated with community parks and neighborhood parks.

Naturalized Landscapes/Turf
These areas are generally un-irrigated and/or naturalized plantings in parks. The target for these areas is to maintain vegetation code compliance and/or natural look and these areas generally receive the lowest service level of maintenance.

1.2.4. Maintenance Service Levels in Vegetated Stormwater Facilities

POS employs a set of Maintenance Standards for vegetated stormwater facilities. The Standards provide detail on the maintenance service level for vegetated stormwater facilities and describes to what degree of servicing they are expected to receive. The service level for any facility is dependent on a variety of factors including, but not limited to, the designed use, aesthetic quality, amount of stormwater treated and pollutant load.

High Service Level Vegetated Stormwater Facilities
The target for these areas is high-quality functionality and aesthetics, and these areas generally receive the highest service level of maintenance. These areas may include highly visible sites associated with arterial streets or facilities which have a large drainage area associated with them or a high pollutant load.

Medium Service Level Vegetated Stormwater Facilities
The target for these areas is an acceptable-quality functionality and aesthetics. These areas receive a moderate service level of maintenance and may be associated with neighborhood streets or medium sized drainage areas or a medium pollutant load.

Low Service Level Vegetated Stormwater Facilities
These areas are generally naturalized plantings associated with small drainage areas or a low pollutant load. The target for these areas is to maintain functionality and vegetation code compliance and/or natural look and these areas generally receive the lowest service level of maintenance.

1.2.5. Maintenance Service Levels in Medians and Right-of-Way Plantings

POS employs a set of Maintenance Standards for medians and right-of way plantings. The Standards provide detail on the maintenance service level for medians and right-of way plantings and describes to what degree of servicing they are expected to receive. The service level for any planting is dependent on a variety of factors including, but not limited to, the location, designed use or aesthetic quality of planting areas.

High Service Level Medians and Right-of-Way Plantings
The target for these areas is high-quality aesthetics or functionality, and these areas generally receive the highest service level of maintenance. These areas may include highly visible sites associated with arterial streets.

Medium Service Level Medians and Right-of-Way Plantings
The target for these areas is an acceptable-quality aesthetic or functionality. These areas receive a moderate service level of maintenance and may be associated with neighborhood streets and less visible locations.

Low Service Level Medians and Right-of-Way Plantings
These areas are generally un-irrigated and/or naturalized plantings in areas of low visibility. The target for these areas is to maintain vegetation code compliance and/or natural look and these areas generally receive the lowest service level of maintenance.

2. Policy on Integrated Pest Management (IPM)

The Eugene City Council has adopted policies that direct the City to pursue sustainability (Resolution #4618, adopted in 2000), protection of natural resources (Growth Management Policy #17), and recovery of threatened Upper Willamette Spring Chinook Salmon (Resolution #4615, adopted in 2000).

Additionally, the Eugene City Council passed Resolution No. 5101 in February 2014. This resolution endorsed the Parks and Open Space Division's IPM policy and operations procedures and encouraged expansion of the Pesticide-Free Parks Program to additional neighborhood parks. In addition, Resolution No. 5101 prohibits the City of Eugene from using any product that contains neonicotinoids on any City property and calls for all departments within the City of Eugene to adopt an IPM policy and associated operational procedures within 18 months of the passage of the resolution.

As part of its role in implementing these policies, and to implement sound land management practices, it is the policy of the City of Eugene Parks and Open Space Division to practice Integrated Pest Management (IPM). IPM is a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet agency pest management objectives.

Under this IPM policy, the Parks and Open Space Division commits to implementing an IPM program that incorporates the five fundamental principles of IPM, as described below.

1. Identify pests and set action thresholds. Before taking any pest control action, first correctly identify the pest you want to control. Then, set an action threshold, a point at which pest populations or environmental conditions indicate that pest control action may be taken. Sighting a single pest does not necessarily mean control is needed. The threshold level is critical to guide future pest control decisions.

2. Monitor and identify pests. Work to monitor pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification reduces the possibility that control methods will be implemented when they are not really needed or that the wrong kind of method will be used.

3. Prevent. As a first line of pest control, work to manage the land to prevent pests from becoming a threat. For example, using mulch in planting beds to suppress weeds, planting desired plants at densities that preclude weeds, selecting pest-resistant varieties, proper site preparation prior to development, and planting pest-free rootstock are examples of prevention techniques. These control methods can be very effective and present little to no risk for people or the environment. Prevention may also include managing weeds at small population densities before the weed becomes established, thereby reducing the input of resources. Catching a weed population while it is small is a way of preventing a large problem in the future. For example, a single purple loosestrife plant along the river

can produce over a million seeds. For these reasons, controlling invasive plants at low densities may be identified as a prevention tool.

4. Control. Once monitoring, identification, and action thresholds indicate that pest control is desired, and preventive methods are no longer effective or available, the next step is to evaluate the proper control method both for effectiveness and risk. Effective, low risk pest controls are chosen first, including mechanical controls, such as mowing, weeding, or trapping. If past experience, further monitoring, identification, and/or action thresholds indicate that low risk controls may not be effective, alternate pest control methods may be employed, such as biological controls or targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is usually a last resort. Chemical control methods will utilize the least toxic and most effective chemicals and adjuvants available.

5. Evaluate the effects and efficacy of control treatments. After a control method is implemented, the efficacy of the treatment is evaluated. Based on this evaluation, methods will be modified in an effort to continually improve outcomes and refine best management practices (BMPs).

The Parks and Open Space Division has restricted the use of all herbicides in parks designated as neighborhood parks. A list of all parks with information as to each park's designation can be found here. In cases where herbicides are the only effective tool for controlling a weed species and where that species is present in active use areas, the Park Operations Manager may approve a *special application request*. The request must document the herbicide free approaches that have been used in the past and why the pest threshold and maintenance standards for the park asset cannot be met without the use of herbicides. When an application is approved, the Park Operations Manager may require a temporary public closure of a defined section of a park if the application would conflict with designated public uses of the area. Closures shall be designed with the intent of minimizing disruption to public use of the larger park. Natural areas and stormwater facilities including those in neighborhood parks, specialty landscapes in ornamental gardens, community parks, and median islands in the public Right-of-Way are excluded from this policy. .

3. IPM Operations Guidelines for Site or Pest Types

3.1. Prairies and Savannas

3.1.1. Description

Prairies and savannas are herbaceous-dominated habitats differentiated primarily by the presence and number of trees present in a grassland setting. Prairies are found in both wetland and upland settings and contain very few to no trees. They often include smaller features with different hydrology such as vernal pools and emergent ponds. Ecologists usually agree that natural prairies and savannas would have evolved with fire and typically would contain no more than two trees and a few shrubs per acre. Savannas may contain up to five mature trees per acre. The tree species that exist in savannas are usually those that are tolerant to fire, and in the Willamette Valley native trees found in savannas and prairies are most commonly oaks or ponderosa pines. Once dominated by prairies, the Willamette Valley floor was burned with some frequency by indigenous people to improve hunting and to maintain important plant species used for food and ceremonial purposes. In the absence of regular periodic burning prairie habitats have become subject to the subsequent encroachment of woody species, and Willamette Valley prairies and savannas are now a rare habitat type; less than 5% of historically occurring prairies and savannas now remain. Prairie and savanna habitats may contain remnant rare plant populations, and the conservation and expansion of rare plants within these areas are a high priority for management. Unmanaged prairies and savannas may succeed to forested ecotypes over time, and management of these habitat types may include the practices of mowing or ecological burns or other management actions to maintain prairie structure as well as the control of weeds or woody vegetation to provide or expand suitable habitat for diverse herbaceous plant communities.

Wetland prairies may be found in areas such as Amazon Park, Coyote Prairie, Bertelsen Nature Park, Meadowlark Prairie, and Dragonfly Bend. Upland prairies exist in Skinner Butte Park, Tugman Park, and the Whilamut Natural Area. An example of oak savanna habitat may be found at Wild Iris Ridge, Suzanne Arlie Park, and South Eugene Meadows.

3.1.2. Action Thresholds

As undeveloped or natural features, prairies and savannas are classified in our parks maintenance classification system as Mode A, B, C, or D areas. The mode designation of a natural area corresponds to the relative natural resource quality of the habitat.

Mode A prairies have been restored or enhanced to generate credits for the City's wetland mitigation bank, or restoration and enhancement has occurred to mitigate for the impacts of City projects to wetlands. Thorough site preparation to remove competing vegetation is critical to the successful establishment of native plant communities; and restoration, enhancement, or research project sites may undergo a period of intense monitoring and weed control of at least five years to reduce competition from weeds and facilitate the establishment of native prairie plant communities. In terms of native plant abundance or diversity, Mode A prairies are often the highest quality sites the City manages. Active mitigation bank sites are required to meet specific performance criteria for vegetation outlined in Mitigation Improvement Plans. Performance

criteria specify standards for percent vegetative cover, percent native cover, and native species diversity; and each mitigation bank site must meet its specified vegetative monitoring criteria in order to achieve certification by the Oregon Department of State Lands and U.S. Army Corps of Engineers. Therefore, invasive plant species or trees and shrubs that may be tolerated at higher levels at other sites will typically be controlled early at mitigation bank sites that have been restored to wetland prairie vegetation to ensure they do not impede establishment or encroach upon the habitat of the native plant community.

Mode B prairies and savannas are generally defined as large or contiguous high-quality prairie and savanna habitats. Mode B areas may be remnant plant communities, may have been significantly enhanced through the implementation of a capital improvement project, may contain rare plants or may be managed to facilitate the expansion of rare plant communities or plant communities with high native species abundance and diversity. Mode C prairies and savannas are medium quality habitats and/or have had a significant natural resource enhancement. Mode D prairies and savannas are generally lower quality or fragmented habitats and may be dominated by non-native species.

The 2005 PROS Comprehensive Plan designated the relative quality of City-owned natural areas using a natural area assessment matrix. Active mitigation bank sites fall outside this designation. Staff review and update the natural area assessment matrix and mitigation site status and goals periodically.

Management actions to achieve or maintain habitat structure and diversity described above and basic stewardship activities are the primary management activities associated with these assets. Action thresholds for pest management in City-owned prairies and savannas are derived from the natural resource quality of the prairies or savannas, in combination with the associated habitat structure and the percent cover of the weed and threat the weed poses to the area. If the habitat structure is not of the desired type or weed populations rise above the action threshold, a control action may be taken. Due to resource constraints or other management issues, Parks and Open Space staff may delay management actions for weeds that are above the action threshold. If poison oak or other poisonous plants are present in areas where the public is likely to come into contact with them then control action may be taken at any time in the interest of public safety.

The current mode classifications are listed in the table below.

Park Name	Prairie/Savanna Type	Mode
Alton Baker Park, Whilamut	upland prairie	C
Amazon Park	mitigated wetland prairies	A
Amazon Park	wetland prairies	B
Amazon Prairie	wetland prairies	A
Amazon Park, upper	wetland prairies	B
Andrea Ortiz	wetland prairie (west natural area portion)	B
Bethel Park	wetland prairies	D
Bertelsen Nature Park: Salawa Meadow	wetland prairie	C

Park Name	Prairie/Savanna Type	Mode
Bertelsen Nature Park: Wallis	wetland prairie	C
Black Oak Basin	wetland prairie, upland prairie/oak savanna	C
Blanton Ridge	upland prairies	C
Coyote Prairie	wetland prairie	A
Coyote Prairie	upland prairie	B
Crest Heights	upland prairie	C
Dragonfly Bend	wetland prairie	A
Dragonfly Bend	upland prairie	B
Gillespie Butte	savanna	C
Golden Gardens	Former farmed grass fields (between future developed park areas and ponds)	D
Gudukut Natural Area	wetland prairie	C
Gudukut Natural Area	upland prairie	D
Hawkins Heights Park	upland prairie	C
Irwin	prairie	D
Tsal-Luk Wah: Nolan Wetlands	wetland prairie	A
Mariposa Woodland	upland prairie	C
Mattie Reynolds Annex	Wetland prairie	B
Meadowlark Prairie	Checkermallow Access wetland prairies	A and B
Meadowlark Prairie	wetland prairies	B and C
Moon Mountain	upland prairie	B
Murray Hill	savanna	C
Murray Hill	upland prairie	C
Mt. Baldy	upland prairie	C
Nolan Mitigation Site	wetland prairie	A
Oakpatch East	wetland prairie	B
Oakpatch West	wetland prairie	B
Rasor Park	upland prairie	C
Skinner Butte	upland prairies	C
Skyview Park	wetland prairie	C
Spencer Butte (summit)	upland prairie/rocky outcrop	B
South Eugene Meadows	upland prairies	B
South Eugene Meadows	savanna	C
Suzanne Arlie Park	wetland prairie, upland prairie, oak savanna	C
Suzanne Arlie Park	savanna	C
Townsend Woods	savanna, upland prairie	D
Tugman Park	upland prairie	C
Tugman Park	wetland prairie	C
Umso Park (formerly Striker Field)	wetland prairie (northern delineated wetland)	D

Park Name	Prairie/Savanna Type	Mode
Videra Park	savanna, upland prairie	C
Wallis St.(A3 Channel)	wetland prairie	C
Wallis St.(A3 Channel)	upland prairie	C
Westmoreland	wetland prairies	B
Willamette Daisy Meadow: Atlantic/Pacific Prairie	wetland prairie	B
Willamette Daisy Meadow: Atlantic/Pacific Prairie	upland prairie	D
Willow Corner	wetland prairie	A
Wild Iris Ridge	wetland prairies	C
Wild Iris Ridge	upland prairies	C
Wild Iris Ridge	savanna	B and C
Wild Iris Ridge (Bailey View Prairie)	Upland prairies	A

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in a prairie or savanna site prior to deciding on a control method. Appendix E assigns weed classifications and describes BMPs for weeds in Mode A prairies. Weed classifications and BMPs for Mode B, C, and D natural resource areas and vacant lands are found in Appendix F.

Mode A Prairies
Class 1, 2, and 3 weeds: each class contains exotic or invasive species that may be controlled to ensure combined weed cover does not exceed 10 - 15%. Control action may be taken when any potentially invasive weed is < 2% weed cover to provide rapid response to invasions of new exotic species and to facilitate the development of native prairie plant communities. Best professional judgment will be used to make efficient use of control methods for site preparation and ongoing management (e.g., if hand weeding crews are removing a Class 2 weed that has reached 10% cover, they may be directed to remove Class 3 weeds occurring at 3% cover from the same area). Appendix E lists weed classes and describes Best Management Practices for weeds in Mode A prairies.

Mode B Prairies and Savannas
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (2% combined weed cover)
Class 3 weeds (5% combined weed cover)

Mode C Prairies and Savannas
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (5% combined weed cover)
Class 3 weeds (10% combined weed cover)

Mode D Prairies and Savannas
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (10% combined weed cover)
Class 3 weeds (20% combined weed cover)

3.1.3. Monitoring and Identification

The maintenance mode of each prairie or savanna will determine what classes of weeds are monitored in that area.

Mode A Prairies
Mode A Prairies under active management are surveyed periodically throughout the growing season to contain and control the establishment of all classes of weeds. Specific monitoring methods and performance criteria for each site are outlined in the Mitigation Improvement Plan for each mitigation bank (Mode A) prairie site and will be carried out for a period of at least five years. At the end of five years, vegetation monitoring will estimate the percent cover of all species in the enhanced wet prairie using point intercept sampling with the goal of achieving a site that is dominated by native plant species where total native composition represents at least 50% cover. Depending on the site, certain weed species will not exceed 10% to 15% of the total vegetative cover after five years. In addition, Mode A prairies will remain largely free of woody vegetation. Outside the five-year monitoring period, annual weed surveys will occur in Mode A prairies.

Mode B Prairies and Savannas
Mode B prairies will be monitored for the presence of all weed classes during the season in which they are to be managed.

Mode C Prairies and Savannas
Mode C prairies will be monitored for the presence of class 1 and 2 weeds. Class 3 weeds will be monitored in Mode C prairies as time and resources allow.

Mode D Prairies and Savannas
Mode D prairies will be monitored for the presence of class 1 weeds only. Class 2 weeds will be monitored in Mode D prairies as time and resources allow. Class 3 weeds will not be monitored in mode D prairies.

3.1.4. Prevention

Mode A, B, C, and D Prairies and Savannas
The following weed prevention methods will be employed in all prairies and savannas: dense post-disturbance reseeding and replanting with species appropriate for the specific habitat, equipment cleaning prior to site entrance, monitoring for new weed introductions, and selection of appropriate locally adapted and healthy plant stock and seeds.

3.1.5. Control

Mode A, B, C, and D Prairies and Savannas

Control methods for weeds in prairies and savannas may vary by weed class, weed species, density of cover, and maintenance mode. In some cases, invasive plant species may be controlled in areas immediately adjacent to restoration and enhancement areas or areas of the highest quality to prevent the spread of undesirable species to areas where they are currently absent. All weeds, regardless of class, will be controlled using the most effective and least toxic method available. If past experience, further monitoring, identification, and/or action thresholds indicate that low risk controls may not be effective, alternate pest control methods may be employed. Chemical control methods will utilize the least toxic and most effective herbicides and adjuvants available.

A list of control methods and weed classifications for specific weed species may be found in Appendices E and F.

3.1.6. Evaluation

When a new Best Management Practice (BMP) is being developed or trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendices E and F as necessary.

3.2. Forests and Woodlands

3.2.1. Description

Though both woodlands and forests are tree dominated landscapes, the two habitat types are ecologically differentiated by their degree of canopy cover. Forests have a largely closed canopy; the branches and foliage of trees interlock overhead to provide extensive and nearly continuous shade, approximately 75% to 100% cover by the tree canopy. Woodlands, on the other hand, have a more open canopy which allows sunlight to penetrate between the trees, or approximating 50-75% cover by the tree canopy. Woodlands may support an understory of shrubs and herbaceous plants, often including grasses and forbs. Forests are generally less diverse in forbs

and grasses but a have a higher diversity of lichens, mosses, and fungi. In western Oregon, forests are generally dominated by Douglas fir, western hemlock, and grand fir. Early successional forests and woodlands in western Oregon may have a history of logging or may be under conversion to a mixed stand in the absence of fire. These woodlands and forests often have a mix of both conifers and hardwoods or are dominated by hardwoods such as Oregon white oak.

Woodland examples include oak and mixed woodlands at Mariposa Woodland, Wild Iris Ridge, and Coryell Ridge and ash woodlands at Amazon Park. Examples of forest may be found at Hendricks Park, Spencer Butte, Skinner Butte, and portions of the Ridgeline Park system.

3.2.2. Action Thresholds

As undeveloped or natural features, forests and woodlands are classified in our parks maintenance classification system as mode B, C, or D areas. The mode designation of a natural area corresponds to the relative natural resource quality of the habitat. Mode B woodlands and forests are generally defined as high quality woodland and forest habitats because they contain diverse age classes, have a predominantly native understory, are large in size, and are contiguous to other open space lands. Mode C woodlands and forests are medium quality habitats because they contain significant weed populations but are still relatively diverse in their native composition. Mode D woodlands and forests are generally lower quality, fragmented, and/or dominated by non-native species. The 20233 POS Natural Areas Assessment designated the relative quality of City-owned natural areas using a natural area assessment matrix. Staff review and update the natural area assessment matrix periodically.

Management and control of exotic invasive species, habitat preservation and restoration, fuels reduction and basic stewardship activities such as site inspections are the primary management activities associated with these assets. Action thresholds for pest management in City-owned woodlands and forests are derived from the natural resource quality of the woodland or forest, in combination with the percent cover of the weed and threat the weed poses to the area. The thresholds triggering control actions are based on the percent cover of weeds present in the management area. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. If poison oak or other poisonous plants are present in areas where the public is likely to come into contact with them then control action may be taken at any time in the interest of public safety. If the area is being managed to reduce hazardous fuels, action may be taken to prevent re-growth to maintain a project undertaken for improving public safety.

The current mode classifications are listed in the table below.

Park Name	Woodland/ Forest Area	Mode
Alton Baker Park	Mixed forest	B
Amazon Headwaters	Conifer forest	C

Park Name	Woodland/ Forest Area	Mode
Amazon Headwaters	Mixed forest	B
Amazon Park	Ash forest	C
Amazon, Upper	Ash woodland	C
Antis Oaks	Mixed forest	C
Bailey Hill	Mixed forest	C
Bertelsen Nature Park	Ash and oak forests	C
Black Oak Basin	Mixed woodland, conifer forest	C
Blanton Ridge	Conifer forest	C
Blanton Ridge	Oak woodland	C
Bond Lane Park	Mixed forest	D
Delta Ponds	Cottonwood forest	B
Edgewood Park	Conifer forest	C
Franklin Park	Maple woodland	D
Coryell Ridge	Oak woodland	B
Coryell Ridge	Mixed forest	C
Gimpl Ridge	Mixed woodland	D
Glen Oak	Oak woodland	C
Hawkins Heights	Conifer forest	C
Hendricks Park	Conifer forest	C
Hendricks Park	Oak woodland	C
Laurelwood Golf Course Natural Area	Conifer forest	D
Lorane Connector	Conifer forest	C
Melvin Miller	Conifer forest	C
Moon Mountain	Conifer forest	D
Moon Mountain	Oak woodland	C
Mount Baldy	Conifer forest	C
Mount Baldy	Oak woodland	C
Mount Baldy	Mixed woodland	C
Murray Hill	Conifer forest	C
Murray Hill	Oak woodland	C
Oakpatch West	Ash forest	C
Polk Street	Ash woodland	D
Pre's Rock	Mixed forest	D
Ribbon Trail	Conifer forest	C
Shadow Wood	Mixed	D
Skinner Butte	Conifer forest	B
Skinner Butte	Mixed woodland	C
South Eugene Meadows	Mixed forest	C
South Eugene Meadows	Oak woodlands	B
Spencer Butte	Conifer forest	B
Spencer Butte	Oak woodland	B
Spencer Butte	Mixed woodland	C
Spencer Butte	Mixed Forest	C
Suzanne Arlie Park	Mixed forest	C

Park Name	Woodland/ Forest Area	Mode
Suzanne Arlie Park	Oak woodlands	B
Townsend Woods	Oak woodlands	C
Townsend Woods	Mixed forest	C
Tugman Park	Oak woodland	B
A3 Channel at Wallis	Ash woodland	D
Walnut Grove Park	Cottonwood forest	C
Wayne Morse Family Farm	Conifer forest	C
Wayne Morse Family Farm	Oak woodlands	B
Wildwood	Mixed forest	D
Wild Iris Ridge	Mixed forest	C
Wild Iris Ridge	Oak woodlands	B
Willis	Oak woodland	C

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in a forest or woodland prior to deciding on a control method. Weed classifications and control methods may be found in Appendix F.

Mode B Woodlands and Forests
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds: Control action may be taken when any Class 2 weeds are observed.
Class 3 weeds: Control action may be taken when any Class 3 weeds are observed.

Mode C Woodlands and Forests
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (5% combined weed cover)
Class 3 weeds (10% combined weed cover)

Mode D Woodlands and Forests
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (10% combined weed cover)
Class 3 weeds (20% combined weed cover)

3.2.3. Monitoring and Identification

The maintenance mode of each woodland or forest will determine what classes of weeds are monitored in that area.

Mode B Woodlands and Forests
Mode B woodlands will be monitored for the presence of all weed classes during the season in which they are to be managed.

Mode C Woodlands and Forests
Mode C woodlands will be monitored for the presence of class 1 and 2 weeds. Class 3 weeds will be monitored in Mode C woodlands as time and resources allow.

Mode D Woodlands and Forests
Mode D woodlands will be monitored for the presence of class 1 weeds only. Class 2 weeds will be monitored in Mode D woodlands as time and resources allow. Class 3 weeds will not be monitored in mode D woodlands.

3.2.4. Prevention

Mode B, C, and D Woodlands and Forests
The following weed prevention methods will be employed in all woodlands and forests: dense post-disturbance reseeding and replanting with species appropriate for the quality and vegetation type of the woodland or forest; equipment cleaning prior to site entrance; annual surveys for new weed introductions; and selection of appropriate locally adapted and healthy plant stock and seeds.

3.2.5. Control

Mode B, C, and D Woodlands and Forests
Control methods for weeds in woodland and forest areas vary by weed class, weed species, and maintenance mode. All weeds, regardless of class, will be controlled using the most effective and least toxic method available. Chemical control methods will utilize the least toxic and most effective herbicides and adjuvants available. A list of control methods and weed classifications for specific weed species may be found in Appendix F.

3.2.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update

Appendix F (Weed Classifications and BMPs for Mode B, C, and D Natural Areas and Vacant Lands) as necessary.

3.3. Waterways

3.3.1. Description

Waterway sites are areas that are comprised primarily of rivers, creeks, ponds, and ephemeral drainages, including the adjacent land area affected by their presence. The width of this land area varies by site. Examples include Amazon Creek, the Willamette River, Delta Ponds, and the A3 channel. Eugene Parks and Open Space recognizes the special importance of the rivers, streams, ponds and wetlands that fall under our stewardship. The sensitive nature of such habitats, their plant and animal communities, and their direct link with other waterways require that we establish specific direction to ensure their health.

3.3.2. Special Requirements

Special management areas along waterways, called *riparian buffer zones,* are defined as a corridor of land that is 25 feet in width on the sides of a stream or other body of water. Measurement of this buffer zone begins at the edge of the water line at the time of application. Anticipated seasonal or weather-related changes affecting water level will be included in the decision-making process when dealing with buffer zones. The *high-water line* as defined in this policy refers to the highest possible water level that would be expected in a given body of water during a 5-year period.

Application Equipment Used

Pesticide delivery for all waterway buffer areas will be carried out by hand with directed, low volume, single wand sprayers, wiping, daubing and painting equipment, injections systems, or drop spreaders. Typically, this is done by backpack sprayers, but may also include sprayers with larger fill tanks as long as the same kind of hand application methods are used. These methods of delivery result in low volume applications and low-pressure spraying. This minimizes the formation of fine mists that might be carried off target. These practices ensure that applied materials will reach targeted plants or targeted soil surfaces.

Pesticide Drift

When applications of pesticides are being made within the riparian buffer zone, great care will be exercised in the process. Managing drift is of particular importance when surface waters are nearby. Equipment used in the application shall employ all necessary methods to limit drift. Nozzle size, pressure regulation, droplet size, and height of spray wand, are all techniques that can be modified to reduce unwanted drift of pesticides.

Spray applications will not be allowed in the riparian buffer zone when:

Wind speed is above 5 mph

Wind direction or activity would carry pesticides toward, or deposit them upon open water

Pesticides Available

To more clearly regulate any possible aquatic impacts, the pesticides available for use in riparian buffer zones and aquatic sites will be reduced in scope from the general park list. Only the pesticides specifically listed below may be used within buffer zones or waterways. Choice of

pesticides utilized take into account any possible effects on aquatic life as well as tendencies to move in the environment.

Materials allowed in buffer zones:

Glyphosate products: Aquastar, Rodeo or equivalent
Triclopyr amine products: Garlon 3A, Vastlan or equivalent.
Aminopyralid products: Milestone or similar
Imazapyr and Imazamox products: Habitat and Clearwater or equivalent
Approved surfactant (i.e. AgriDex)

Materials allowed in certain circumstances in aquatic sites, aquatic labeled only:

Glyphosate products:Aquastar, Rodeo or equivalent
Imazapyr and Imazamox products: Habitat and Clearwater or equivalent
Approved surfactant (AgriDex or equivalent)

3.3.3. Action Thresholds

As undeveloped or natural features, waterways are classified in our parks maintenance classification system as mode B, C, or D areas. The mode designation of a waterway corresponds to the relative natural resource quality of the waterway. In the waterways management area, Mode B areas are generally defined as high quality aquatic and riparian habitats, Mode C waterways are medium quality aquatic and riparian habitats and/or have had a significant tree planting or other natural resource enhancement, and Mode D waterways are generally lower quality aquatic and riparian habitats. The 2005 PROS Comprehensive Plan designated the relative quality of City-owned natural areas using a natural area assessment matrix. Staff review and update the natural area assessment matrix periodically.

Management and control of exotic invasive species, bank stabilization, habitat preservation and restoration, conveyance management, and water quality are the primary management activities associated with these assets. Action thresholds for pest management in City-owned waterways are determined by using the natural resource mode of the waterway, in combination with the percent cover of the weed and the weed classification as defined in Appendix F. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. The thresholds triggering control actions are based on the percent cover of weeds present in the waterway. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. If poison oak or other poisonous plants are present in areas where the public is likely to come into contact with them then control action may be taken at any time in the interest of public safety.

The current mode classifications are listed in the table below.

Area/ Waterway	Reach	Mode
A - 2 Channel	Roosevelt north along Beltline	D
A - 2 Channel	Beltline to Ohio Street, including Golden Gardens Park	D
A - 3 Channel	Seneca to Bertelsen Nature Park	D
A - 3 Channel Bertelsen Nature Park		B

Area/ Waterway	Reach	Mode
A - 3 Channel	Bertelsen to Terry	D
A - 3 Channel	Terry to Amazon Confluence	C
Amazon Creek	Headwaters	B
Amazon Creek	Martin to Snell	B
Amazon Creek	Snell to Fox Hollow	C
Amazon Creek	Fox Hollow to 30th Ave.	C
Amazon Creek	Amazon Park Reach	C
Amazon Creek	Concrete Section (24th Street to Fairgrounds)	D
Amazon Creek	Fairgrounds to Chambers	C
Amazon Creek	Chambers to City View	C
Amazon Creek	City View to Oak Patch	C
Amazon Creek	Oak Patch to Acorn Park	C
Amazon Creek	Acorn Park to South Terry Street	C
Amazon Creek	South Terry Street to Royal	B
Amazon Creek	Royal to Fern Ridge Reservoir	B
Arrowhead Park	Flat Creek	C
Ascot Park	Willakenzie Floodway	D
Awbrey Park	Spring Creek	B
Beltline Floodway	Old Coburg Rd to Coburg Rd	D
Beltline Floodway	Coburg Rd to Cal Young School	D
Beltline Floodway	Cal Young School to Ayres Pond	D
Bethel-Danebo	Cody Swale	D
Bramblewood Park	Flat Creek	C
Canoe Canal	I-5 to Autzen Stadium Foot Bridge	C
Canoe Canal	Autzen Stadium Foot Bridge to Willamette	C
Creekside Park		D
Delta Ponds		B
Empire Pond		D
Gilham Park	Gilham Creek	D
Golden Gardens Ponds	Ponds	B
Greenhill Tributary	Throne detention ponds	D
Greenhill Tributary	Terry to Dragonfly Bend	B
Heron Slough	Heron Pond to Willamette River	B
Lafferty Park	Un-named creek	C
Marshall Channel	Baxter to Beltline	D
Millrace		D
Osprey Hollow	Dodson Slough, 2 branches (trib to Willamette)	C
River Loop Park	Willamette River	B
Riverfront Park	Willamette River section, old EWEB property	C
Roosevelt Channel	Maple St. to Beltline	C
Royal Creek	South of Royal	C
Royal Creek	Candlelight Park to Greenhill Tributary	C
Santa Clara Waterways		C

Area/ Waterway	Reach	Mode
Sorrel Way Ponds		C
Spring Creek	Springwood Drive	B
Timberline Creek	at Summit Sky Blvd.	B
Tugman Creek	Tugman Park	B
Videra Creek	Braewood detention ponds	D
Videra Creek	Videra Park	C
Walnut Grove	Ponds and Flat Creek	D
Wayne Morse Family Farm	Un-named creek through park.	C
Wendover	Slough (East Santa Clara Waterway)	C
Willamette River	North Bank, West Alton Baker	C
Willamette River	Whilamut- Frohnmayer Footbridge Area	B
Willamette River	South Bank, Skinner Butte, Maurie Jacobs	C
Willamette River	East Bank	C
Willamette River	West Bank, including riparian portions of Rasor Park and Hillcrest	C

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in a waterway site prior to deciding on a control method. Weed classifications and control methods may be found in Appendix F.

Mode B Waterways
All weed classes: Control action may be taken when any listed weed is < 2% weed cover
Class 1 weeds: Control action may be taken when any Class weeds are found.
Class 2 weeds (5% weed cover)
Class 3 weeds (10% weed cover)

Mode C Waterways
All weed classes: Control action may be taken when any listed weed is < 2% weed cover
Class 1 weeds: Control action may be taken when any Class 1 weeds are found.
Class 2 weeds (20% weed cover)
Class 3 weeds (35% weed cover)

Mode D Waterways
All weed classes: Control action may be taken when any listed weed is < 2% weed cover
Class 1 weeds: Control action may be taken when any Class 1 weeds are found.
Class 2 weeds (25% weed cover)
Class 3 weeds will be controlled in Mode D areas if they pose a public hazard/nuisance.

3.3.4. Monitoring and Identification

The maintenance mode of each waterway will determine which classes of weeds are monitored in that area.

Mode B Waterways

Mode B waterways will be monitored for the presence of all weed classes during the season in which they are to be managed.

Mode C Waterways
Mode C waterways will be monitored for the presence of class 1 and 2 weeds. Class 3 weeds will be monitored in Mode C waterways as time and resources allow.

Mode D Waterways
Mode D waterways will be monitored for the presence of class 1 weeds only. Class 2 weeds will be monitored in Mode D waterways as time and resources allow. Class 3 weeds will not be monitored in mode D waterways.

3.3.5. Prevention

Mode B, C, and D Waterways
The following weed prevention methods will be employed in all waterways: dense post-disturbance reseeding and replanting with species appropriate for the quality and vegetation type of the waterway, equipment cleaning prior to site entrance, annual surveys for new weed introductions, and selection of appropriate locally adapted and healthy plant stock and seeds.

3.3.6. Control

Mode B, C, and D Waterways
Control methods for weeds in waterways vary by weed class, weed species, and maintenance mode. All weeds, regardless of class, will be controlled using the most effective and least toxic method available. Chemical control methods will utilize the least toxic and most effective herbicides and adjuvants available. A list of control methods and weed classifications for specific weed species may be found in Appendix F.

3.3.7. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will

document the results during the monitoring cycle for the site. Staff will review and update Appendix F (Weed Classifications and BMPs for Mode B, C, and D Natural Areas and Vacant Lands) as necessary.

3.4. Vegetated Stormwater Facilities

3.4.1. Description

Vegetated stormwater facilities are water treatment systems designed to remove pollutants from storm water flows in or near roadways, parking lots, buildings, and other hard/soft surface areas that may generate storm runoff. They are predominately planted with wetland species, tolerant of standing water. These stormwater facilities are vegetated to slow the flow of water and to sequester pollution through plant uptake and sedimentation.

3.4.2. Special Requirements

Stormwater catch basins and inlets – No pesticides will be applied within 5 feet of any catch basin or inlet that leads to the piped stormwater system.

Vegetated stormwater facilities have the same *riparian buffer zones* as waterways. See Section 3.3.2 for special requirements when herbicide use is needed in a vegetated stormwater facility.

Vegetated stormwater facilities located within developed parks may have additional No Pesticide Zones. These include Pesticide Free Parks, playgrounds, and water spray features. See Appendices A-B for details on No Pesticide Zones.

3.4.3. Action Thresholds

Weed management is performed in vegetated stormwater facilities to preserve the filter's ability to remove pollutants and meet other storm water goals. Landscaped stormwater facilities may also be managed for aesthetic values. All stormwater facilities should be kept free of high-threat invasive exotic weeds. The service level designation for each vegetated stormwater facility is determined by location, the planting scheme, and the visibility/quality of the surrounding plant communities. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. A control action may also be taken if vegetation of any type is found to impede the intended operational design of a stormwater facility.

The current mode classifications are listed in the table below.

Location of Vegetated Stormwater Facility	Service Level
8th Ave Planters	High
8th & Hilyard parking lot	High

Addyson Creek	Medium
Alder Springs	Medium
Alko Village	Medium
Alton Baker Park Lot 8 parking lot	High
Alton Baker Science Center parking lot	High
Amazon Pool parking lot	Medium
Amazon & 29th	High
Applewood Subdivision	Medium
Argon Ave	Medium
Audel	Medium
Barger Dr	High
Berkely Park	Low
Braewood West Subdivision	High
Briana	Medium
Bushnell Lane	Low
Buster Place	Medium
Calumet	Medium
Candlelight Park	Low
Capital Hill	Medium
Cedar Brook	Medium
Chad Drive	Medium
Chamotee Trails	Medium
Charnel Mulligan Park	Medium
Claire's Crossing	Medium
Commerce St	Medium
Country Haven Subdivision	Medium
County Farm	Medium
Creekside Park	Medium
Crescent Village	Medium
Crest Drive/ Storey Blvd.	High
Delta Cottages	High
Delta Highway North	Medium
Delta Ponds Overlook	Medium
Delta Ridge	Medium
East 18th Ave	High
East 19th Ave	High
East 20th	Medium
East Amazon	Medium
East Ridge Village PUD	Medium
Elmira/Maple Road	High
Escalante	Medium
Estates at Meadowview	Medium
Fairfield St	Medium
Federal Court House	High

Ferndale Swale	Medium
Fleck Subdivision	Low
Furtick Partition	Medium
Harris St	Medium
Howard Meadows	Medium
Game Farm Road North	Medium
Garden Ave	High
Garden Place	Low
Helen St	Medium
Highway 99	High
Howard Meadows	Medium
Jefferson St	High
Kersey	Medium
Lakeview	Medium
Leo Harris Pkwy	High
Lincoln School Park	Medium
Lombard Apartments	Medium
LTD EmX Planters 6th, 7th, 11th	High
LTD Santa Clara Station	High
Macintosh Manor Subdivision	Medium
Magnificence at Bethel	Medium
Manzana	Medium
McKenzie at Crescent	Medium
Meadowview Park	Medium
Meadowview Subdivision	Medium
Michael's Choice	Medium
N Park Meadows	Medium
N Park & Maxwell	Medium
Nelson Place	Medium
Old Coburg Rd	Medium
Pennington Acres	High
Peregrine St	Medium
Plank	Medium
Plumley Green	Medium
R & R Haven	Medium
River Ave.	Medium
River Rd & Irving	High
Riverfront District	High
Riverfront Park	High
Riverview/Franklin	Medium
Robert Moore Subdivision	Medium
Roosevelt Blvd Planters	High
Roosevelt Yard Rain Garden	High
Rosetta/Benjamin	Medium

Royal Creek at Heron Meadows	High
Santa Clara Community Park	Medium
Sheldon Pool Parking Lot	High
Skinner Butte Parking Lot	High
Sladden Park	Low
South Willamette Planters	High
St. Vincent de Paul Division Avenue	Low
Sterling Woods	High
Sullivan Meadows	Medium
The Nines	Medium
The Reserve at Gilham	Medium
Throne Detention Ponds	High
Timberline Hills PUD	High
Umso Park	Medium
Washington Jefferson Park	Medium
Wedgewood Meadows	Medium
Wendell Canyon	Medium
West 13th and Dani	Medium
West 18th Ave	Medium
West Bank Trail	Medium
West University Park	Medium
Wild Rose Estates	Medium
Willakenzie Park	Medium
Willowbrook	High
Willow Run	Medium

High Service Level Vegetated Stormwater Facilities
Class 1 weeds: Control action may be taken when any Class 1 weeds are found.
Class 2 weeds (5% weeds)
Class 3 weeds (10% weeds)

Medium Service Level Vegetated Stormwater Facilities
Class 1 weeds: Control action may be taken when any Class 1 weeds are found.
Class 2 weeds (20% weeds)
Class 3 weeds (35% weeds)

Low Service Level Vegetated Stormwater Facilities
All weed classes: Control action may be taken when any listed weed is < 2% weed cover
Class 1 weeds: Control action may be taken when any Class 1 weeds are found.
Class 2 weeds (25% weed cover)
Class 3 weeds will be controlled in Low Service Level areas if they pose a public hazard/nuisance.

3.4.4. Monitoring and Identification

High Service Level Vegetated Stormwater Facilities
High service level vegetated stormwater facilities will be monitored 4-6 times per year for the presence of all weed classes.

Medium Service Level Vegetated Stormwater Facilities
Medium service level vegetated stormwater facilities will be monitored 2-4 times per year for the presence of all weed classes.

Low Service Level Vegetated Stormwater Facilities
Low service level vegetated stormwater facilities will be monitored 1-2 times per year for the presence of all weed classes.

Management and control of unwanted debris, invasive grasses, weeds, and trees are the primary activities associated with these sites. The thresholds triggering control actions are based the threat posed by the weed species combined with the percent weed cover present in the vegetated stormwater facility. Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in a vegetated stormwater facility prior to deciding on a control method.

3.4.5. Prevention

The following weed prevention methods will be used in all vegetated stormwater facilities: Establishing dense communities of plants to eliminate open soil; using proper mulch types and rates; monitoring irrigation to ensure proper plant health; and, removing thatch and other debris that may lead to reduced filtration capability.

3.4.6. Control

High, Medium, and Low Service Level Vegetated Stormwater Facilities
Weed classifications and best management practices (BMPs) to control weed species in vegetated stormwater facilities can be found in Appendix F.

3.4.7. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendices F as necessary.

3.5. Vacant Lands Intended for Future Park Development

3.5.1. Description

Vacant lands intended for future park development are defined as undeveloped park lands that were purchased with the intent of developing them for a mixture of active and passive recreational uses. Vacant lands were not purchased primarily for a natural resource value or function, but instead were purchased to provide a future park containing developed features such as irrigated turf, playgrounds, sports fields, and other active recreational features. Because of this intention for future development, few management activities other than vegetation management, debris and trash pickup, and hazard abatement occur at the sites. The thresholds for weeds in these sites are substantially higher than in other management areas.

The inventories of these sites will likely change as current sites are developed and new sites are purchased. Current examples of vacant lands are Terra Linda Park, Wendover Park, Santa Clara Park, and Lone Oak Park.

3.5.2. Action Thresholds

Vacant lands fall in the naturalized landscapes and naturalized turf categories of developed parks. Management and control of exotic invasive species, mowing for vegetation control, fence line vegetation control, and basic stewardship activities such as regular site inspections are the primary management activities associated with these assets. Action thresholds for pest management in City-owned vacant lands are derived from the maintenance mode of the park area in combination with the percent cover of the weed and threat the weed poses to the area. The thresholds triggering control actions are based on the percent cover of weeds present at the park site. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints.

The current service levels and vacant lands are listed in the table below.

Key to Landscape Chart Service Levels:

NL = Naturalized Landscape
NT = Naturalized Turf

Name of Vacant Lands	Mode
Andrea Ortiz	NT, NL
Bobolink	NT, NL
Chase Commons (excluding waterways and riparian areas)	NT, NL
Ferndale Park	NT, NL
Golden Gardens (excluding ponds, waterways, and riparian areas)	NT, NL
Grasshopper Park	NT, NL
Lone Oak Park	NT, NL
Mattie Reynolds	NT, NL
Ruby Park	NT, NL
Terra Linda Park	NT, NL
Warbling Creek	NT, NL
Wendover Park (excluding waterways and riparian areas)	NT, NL
West Bank Willamette River at Maynard and Hillcrest Streets (excluding waterways and riparian areas)	NT, NL
Wildwood Park	NT, NL
Willakenzie (PDD land maintained by POS OPS)	NT, NL

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in vacant lands prior to deciding on a control method. Weed classifications and control methods may be found in Appendix G.

Naturalized Landscapes
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (50% weeds)
Class 3 weeds may not be controlled in Naturalized Landscape areas.
Naturalized Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (25% weeds)
Class 3 weeds (50% weeds)

3.5.3. Monitoring and Identification

The maintenance service level of each landscape area will determine which classes of weeds are monitored in that area.

Naturalized Landscapes
Naturalized Landscapes will be monitored quarterly for the presence of class 1 and 2 weeds.

Naturalized Turf
Monitoring on all turf areas is on-going and performed throughout the year. Although the focus of this program is weed management, it is also very important to monitor for over-all turf health and vigor. Weed monitoring will primarily be performed in the spring (late April or early May), early summer (mid to late June), and again in late summer or fall (late August to late September).

3.5.4. Prevention

The following weed prevention methods will be employed in all vacant land sites: dense post-disturbance reseeding and replanting with species appropriate for the quality and vegetation type of the site; and, annual surveys for new weed introductions.

3.5.5. Control

Control methods for weeds in vacant land areas vary by weed class. All weeds, regardless of class, will be controlled using the most effective and least toxic method available. Chemical control methods will utilize the least toxic and most effective herbicides and adjuvants available. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.5.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G (Weed Classifications and BMPs for Developed Parkland, Vacant Lands and Right-of-Way) as necessary.

3.6. New Park Construction

3.6.1. Description

When new parks are developed, the City usually hires contractors for park construction. Parks and Open Space Division staff may require contractors to modify or control vegetation to achieve the specifications in the contract.

3.6.2. Action Thresholds

In the development or construction of parks, action thresholds are based on the City of Eugene's construction specifications. Weed threshold levels and specifications for modifications to

vegetation are identified prior to start of construction and are defined in the project contract and implemented within the context of this policy.

3.6.3. Monitoring and Identification

Monitoring will be performed by the project manager or inspector for the park development project.

3.6.4. Prevention

- Minimize soil compaction in both turf and shrub areas
- Test soils for proper pH and organic content
- Supplement shrub soils with additional organic matter
- Sow turf seed in the appropriate season (usually May – September 15th)
- Provide supplemental irrigation as required
- Mow turf when it reaches a height of 3 inches; follow up with a water soluble fertilizer at a rate of 1lb.N/1000 sq. ft., as required

3.6.5. Control

If weed tolerances exceed the contract specifications for any weed classes, the contractor is responsible for meeting specified outcomes. BMP's for new park construction are outlined in Appendix G.

3.6.6. Evaluation

Evaluation will occur throughout the project as required to determine success of meeting the contract specifications. At any pre-final inspections and at the final inspection, the project manager and representatives of the Parks and Open Space Division will review the work and verify that the contractor has met all contract specifications regarding vegetation associated with the development of new parks.

3.7. Hard Surface Areas

3.7.1. Description

Hard surface areas include all paved surfaces within developed parkland or natural areas, and any surfaces in the rights-of-way for which POS staff has maintenance responsibility, including pathways, ball courts, picnic areas, skate parks, bridge abutments, and street medians. Hard surfaces are typically constructed of cement, brick, or asphalt.

3.7.2. Action Thresholds

Vegetation management is performed on hard surfaces for a variety of reasons, including to preserve the surface's overall integrity, maintain ADA code compliance, maintain aesthetic value, and eliminate tripping hazards. Control action may be taken when any weeds are observed

growing in any hard surface. Weed classifications and control methods may be found in Appendices F- J.

3.7.3. Monitoring and Identification

Monitoring frequencies for hard surfaces are consistent throughout the park system and are not determined by the maintenance service level of the parkland in which the surface is located. This is primarily due to the need to maintain accessibility, preserve surface integrity, and protect public safety. Monitoring of hard surfaces will be performed on a quarterly basis, coinciding with the lifecycles of the targeted weeds.

3.7.4. Prevention

The primary preventative practice for weed encroachment on hard surfaces is surface cleaning and crack sealing. Keeping the surfaces as clean as possible and systematically cleaning and sealing cracks in hard surfaces is the most effective technique to keep hard surfaces below action thresholds. Where time and budget allow, preventative surface cleaning and systematic crack sealing should be utilized.

3.7.5. Control

If the preventative practices described above do not achieve control at or below set thresholds, then mechanical controls (e.g., hand removal, flaming, or crack cleaning and crack sealing) should be used. Given the runoff potential of hard surfaces, it is important to focus on preventative actions and mechanical controls. If it is deemed necessary to use an herbicide, then the least toxic and most effective herbicide will be used. In the case of woody perennial species such as trees and shrubs growing out of a concrete seam, herbicides may be the only tool available to effectively address the issue. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.7.6. Evaluation

Before any control action is taken, past control strategies will be reviewed to evaluate effectiveness and other options will be considered if necessary.

3.8. Landscape Beds

3.8.1. Description

Landscape beds, such as shrub and flower beds, include all non-turf plantings in developed parks, and around community centers, pools, and other public facilities.

3.8.2. Action Thresholds

Weed management is performed in landscapes to preserve the landscape's aesthetic qualities, functionality and maintain safe public spaces. This includes providing accessible facilities,

eliminating tripping hazards, and preserving the function of pathways and driveways. Landscape management is also performed to prevent the spread of invasive species to other parts of the park system.

The action threshold level for each landscape area is directly correlated to the service level set for each landscape bed in a park based on the City of Eugene's Park Maintenance Standards. The service level is determined by the design, location of the landscape beds and the visibility/complexity of the plant communities. Management and control of grass and broadleaf weeds are the primary activities associated with these sites. The thresholds triggering control actions are based on the percent cover of weeds present in the landscape beds. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. The current service level classifications are listed in the table below.

The current service level classifications are listed in the table below.

Key to Landscape Chart Service Levels:

SL = Specialty Landscape
L = Landscape
NL = Naturalized Landscape
All = All Landscape Service Levels Present

Park	Service level
Alton Baker Park	All
Amazon Ball/Tennis	L
Amazon Park	All
Arrowhead Park	L
Awbrey Park	L
Bethel Community Park	L
Brewer Park	NL
Campbell Senior Center	All
Charnel-Mulligan Park	L
Country Lane Park	NL
Crescent Park	L
Cuthbert Amphitheater	All
Delta Ponds Parking Lot	L/NL
Echo Hollow Pool	All

Park	Service level
Fairmount Park	L
Filbert Meadows Park	L
Frank Kinney Park	L/NL
Friendly Park	L
Gilbert Park	L
Gilham Park	L
Hays Memorial Tree Garden	SL
Hendricks Park Gardens	All
Hilyard Center	All
Irwin Park & Connector	L
Lamb Cottage	NL
Lark Park	L
Laurelwood Golf Course	All
Lincoln School	L
Mangan Park	L/NL
Martin Luther King Park	L
Maurie Jacobs Park	L
Milton Park	L
Monroe Park	L
Oakmont Park	L
Owen Rose Garden	SL
Petersen Barn and Park	All
POS/PWM Yard at 1820 Roosevelt Blvd.	All
Rosetta Park	L
Riverfront Park	L
Santa Clara Park	L
Science Factory Parking Lot	L
Scobert Gardens Park	L/NL
Shadow Wood Park	L
Sheldon Center and Pool	All
Skinner Butte Park	All
Skyview Park	L
Sladden Park	L
State St Park	L
Tandy Turn Park	L
Trainsong Park	L
Tugman Park	L
Umso Park (formerly Striker Field)	L
University Park	L
Videra Park	L
Walnut Grove Park	NL
Washburne Park	L/NL
Washington Park	L
Washington/Jefferson Park	L/NL

Park	Service level
Wayne Morse Family Farm Park	L/NL
West University Park	L
Willakenzie Park	L

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in landscape beds prior to deciding on a control method. Weed classifications and control methods may be found in Appendix G

Specialty Landscapes
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (5% weeds)
Class 3 weeds (10% weeds)

Landscapes
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (25% weeds)
Class 3 weeds (50% weeds)

Naturalized Landscapes
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (50% weeds)
Class 3 weeds may not be controlled in Naturalized Landscape areas.

3.8.3. Monitoring and Identification

The maintenance service level of each landscape area will determine which classes of weeds are monitored in that area.

Specialty Landscapes
Specialty Landscapes will be monitored biweekly for the presence of all weed classes throughout the calendar year.

Landscapes
Landscapes will be monitored monthly for the presence of all weed classes.

Naturalized Landscapes
Naturalized Landscapes will be monitored quarterly for the presence of class 1 and 2 weeds.

3.8.4. Prevention

Landscapes
The following weed prevention methods will be used in all landscape sites: Planting dense communities of plants in landscape beds to reduce open soil; using appropriate mulch types and application rates; and monitoring irrigation to ensure proper plant health.

3.8.5. Control

Landscapes
A list of best management practices for controlling weed species in landscape areas of all service levels is located in Appendix G.

3.8.6. Evaluation

Class 1, 2, 3 and 4 weed control actions
When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G as necessary.

3.9. Medians and Other Right-of-Way Plantings

3.9.1. Description

Right-of-way plantings include medians, which are located between travel lanes, and other landscaped areas in the right-of-way such as curbside plantings, bridge approach plantings and landscaping around overpasses.

3.9.2. Special Requirements

Stormwater catch basins and inlets – No pesticides will be applied within 5 feet of any catch basin or inlet that leads to the piped stormwater system.

3.9.3. Action Thresholds

The action threshold level of a median or other Right-of-Way (ROW) area is directly correlated to the service level, which is determined by the location of the median/ROW and the visibility/complexity of the landscaping. Weed management is performed in landscaped right-of-way areas to preserve the function, integrity, and aesthetics of the landscape, to preserve Visual

Clear Zones for public safety, and to preserve the intended design and aesthetic value of the landscape.

Management and control of grass, invasive trees and broadleaf weeds are the primary activities associated with these sites. The thresholds triggering control actions are based on the percent cover of weeds present in the landscape beds. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints.

The current service level classifications are listed in the table below.

Medians/Rights-of-Way	Service Level
I-5 Bike Path	Low
15th St Medians/Diverters	Medium
13th & Dani	Medium
28th & Alder Traffic Circle	Medium
SMJ Blvd. Medians	High
8th Ave and Chambers Medians	High
8th Ave and Hilyard Right-of-way	High
Amazon Pkwy Medians and right-of-way	High
Ayers Medians	Medium
Arcadia	Medium
Augusta	Medium
Bailey/Bogart Medians	Medium
Bailey Hill Medians	High
Barger Medians	High
Broadway	High
Centennial Plaza Median	Medium
Chad Dr. Medians	Medium
Chambers Connector	High
Coburg Road Medians	High
Crest Dr.	Medium
Delta Medians	High
Douglas Dr	Medium
Downtown Riverfront Development Right-of-way	High
Federal Courthouse right-of-way	High
Ferry Street Bridge Medians and right-of-way	High
Floral Hill Median	Medium

Medians/Rights-of-Way	Service Level
Franklin Blvd Medians	High
Garden Way Medians and right-of-way	Medium
Gilham Medians	Medium
Goodpasture	High
Highway 99 Medians	High
Hilyard Medians and right-of-way	High
Island Lake Medians	Medium
Kingsley Medians/Diverters	Low
Lassen Medians	Medium
Legacy Medians	High
Meadowview Park Medians	Medium
North Agate Medians	Medium
North Terry Medians	High
Oakway Median	High
Patterson Median	Low
Pitchford Avenue Median	Medium
River Road Medians	High
River Road and Irving Medians	High
Solar Heights Medians	Medium
South Terry Medians	High
Villard Medians	Medium
Washington Jefferson Ramps	Medium
Washington Jefferson right of way	Medium
West 11th Medians and right-of-way	High
Westec Circle	Medium
Willakenzie Medians	Medium
Willow Creek Medians	High
Woonerf Medians/Diverters	High

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds in medians and rights of way prior to deciding on a control method.

High Service Level Medians or Right-of-Way Areas
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (5% weeds)
Class 3 weeds (10% weeds)

Medium Service Level Medians or Right-of-Way Areas
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (25% weeds)
Class 3 weeds (50% weeds)

Low Service Level Medians or Right-of-Way Areas
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (50% weeds)
Class 3 weeds will not be controlled in Low Service Level areas.

3.9.4. Monitoring and Identification

The maintenance mode of each median will determine which classes of weeds are monitored in that area.

Arterial Street Medians or Right-of-Way Areas
Landscapes will be monitored monthly for the presence of all weed classes throughout the calendar year.

Residential Medians or Right-of-Way Areas
Landscapes will be monitored quarterly for the presence of all weed classes

3.9.5. Prevention

All Medians or Right-of-Way Areas
The following best management practices will be employed in all median and right-of-way areas: Selecting appropriate and healthy plant stock and seeds; establishing dense plant communities to reduce vacant soil; establishing appropriate mulch rates and type; using pruning techniques to enhance plant structure and growth; and, proper irrigation rates for plant health.

3.9.6. Control

A list of best management practices for controlling weed species in all median and right-of-way areas is located in Appendix G.

3.9.7. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest,

staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G as necessary.

3.10. Trails and Pathways

3.10.1. Description

Trails and pathways are pervious surface trails within parks and natural areas, typically constructed of aggregate, wood chips, or bark. Weed management is performed on trails and pathways to preserve the trail or pathway's overall safety, to maintain full access to facilities, to eliminate tripping hazards, and to preserve the integrity and function of pathways. (Note: Hard surface, paved paths are covered in section 3.7.)

3.10.2. Action Thresholds

The service level of the trail and pathway corresponds to the maintenance service level of the park area adjacent to the path. See the service level designation tables for the parkland area adjacent to the path for the action threshold information for that particular path.

Ocular estimation tools are provided in Appendix O and can be used by staff as a reference for estimating the percent cover of weeds along trails and pathways prior to deciding on a control method. Weed classifications and control methods may be found in Appendices F- J.

3.10.3. Monitoring and Identification

Monitoring on all trails and pathways is on-going and performed throughout the year. Although the focus of this program is weed management, it is also very important to monitor in order to preserve the path's surface and protect public safety. Weed monitoring will primarily be performed in the spring (late April or early May), early summer (mid to late June), and again in late summer or fall (late August to late September).

3.10.4. Prevention

- Monitor path surface depth (e.g., bark depth or rock depth). Add new surface material when depth become thin to help depress weeds
- Minimize irrigation over-spray during the summer months
- Make sure the path width supports the use of the trail; narrow paths for walking, wide paths for competitive running and jogging
- Place pathways only where they will be used and encourage the use of paths through signage and information
- Place geotextile filter cloth under trail or pathway during construction to suppress future perennial weed growth

3.10.5. Control

When threshold levels have been reached in path areas, control strategies will primarily focus on mechanical action. On gravel paths, flaming can be effective when managing newly emerged weeds in late winter before they are established. In a window of dry weather, an approach similar to infield management can be used. Paths can be lightly scarified using the Roterra, leaving shallow-rooted weeds to desiccate from exposure.

3.10.6. Evaluation

Prevention and control methods for paths will be evaluated for effectiveness on an annual basis. Adjustments will be made if necessary.

3.11. Turf Areas

3.11.1. Description

The goal of the turf management operations for developed parks and POS maintained rights-of-way is to establish and maintain safe turf grass surfaces that are appropriate for the areas intended use or aesthetic goals. Managed turf grass areas include sports fields, general service parks, and around community centers.

3.11.2. Action thresholds

Weeds are controlled in turf areas for a variety of reasons including public safety (ex. uneven sports field surfacing, weeds with thorns) and prevent the spread of invasive species. Action thresholds for weeds are set at specific service levels that maintain the aesthetic appearance of the original park design; protect public health and safety; ensure the overall health and quality of turf areas. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions until and appropriate time even if weeds are above the action threshold due to resource constraints, weather conditions, use, live cycle of the weed, etc.

Specialty Turf
The target for these areas is a good-quality turf, which is considered aesthetically pleasing or serve a very specific use. They are associated with highly visible sites, such as Floral Gardens or Community Centers, or athletic fields that demand a smooth and dense playing surface. These areas require the highest service level of maintenance.

General Turf
The target for these areas is a fair-quality turf. They include low use lawns at Community Centers and turf in neighborhood parks. These areas require a moderate service level of maintenance.

Naturalized Turf

The target for these areas is a good-quality ground cover. These areas are generally associated with walkways, medians, and low-growth areas. They receive the lowest level of service.

The current service level classification for turf areas are listed in the table below.
Key to Turf Service Level Chart:

ST = Specialty Turf
T = General Turf
NT = Naturalized Turf
All = All service levels present

Location	Service level
Acorn Park	T
Alton Baker Park	All
Amazon Park	T
Amazon Parkway	T
Amazon Pool	ST
Ascot Park	T
Arrowhead Park	T
Berkeley Park	T
Bethel Community Park	T/NT
Bond Lane Park	T
Bramblewood Park	T
Brewer Park	T/NT
Candlelight Park	All
Centennial Lawns	T
Chambers Connector	T/NT
Charnel Mulligan Park	T
Country Lane Park	T
Creekside Park	T/NT
Crescent Park	T
Cuthbert Amphitheater	ST/T
Echo Hollow Pool	ST/T
Fairmount Park	T
Federal Courthouse right-of-way	T
Ferry Street Bridge Level 1 turf	T
Filbert Meadows Park	T/NT
Frank Kinney Park	T
Friendly Park	T
Gateway area of Ferry Street Bridge	ST
Gilbert Park	NT
Gilham Park	T
Hays Memorial Tree Garden	ST
Hendricks Park	All
Hilyard Community Center	T

Location	Service level
Hilyard right-of-way	T
Irwin Connector	T
Irwin Park	T
Jefferson School	T
Lafferty Park	T
Lark Park	T
Laurel Hill Park	T
Laurelwood Golf Course	ST
Lincoln School	T
Mangan Park	T
Marche Chase Park	T
Martin Luther King Park	T
Maurie Jacobs Park	All
Milton Park	T
Monroe Park	T
Monroe School	T
Morse Family Farm Park	T
Mount Ernie (at Alton Baker Park)	T
Oakmont Park	T
Owen Rose Garden	All
Petersen Barn Park	All
Public Works 1820 Roosevelt Boulevard	All
RiverPlay Lawns	ST/T
Riverfront Park	T
Rosetta Park	T
Santa Clara Park	T
Scobert Gardens Park	T
Shadow Wood Park	T
Skinner Butte Park	T
Skyview Park	T
Sladden Park	T
State Street Park	T
Tandy Turn Park	T
Trainsong Park	T
Tugman Park	T
Umso Park (formerly Striker Field)	T
University Park	T
Walnut Grove Park	NT
Washburne Park	T
Washington Jefferson Park	T
Washington Park	All
West University Park	T
Westmoreland Park	T
Willakenzie Park	T/NT

Ocular estimation tools are provided in Appendix O and can be used by staff as a as a reference for estimating the percent cover of weeds in a turf area prior to deciding on a control method.

Specialty Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (5% weeds)
Class 3 weeds (10% weeds)

General Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (10% weeds)
Class 3 weeds (25% weeds)

Naturalized Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (25% weeds)
Class 3 weeds (50% weeds)

3.11.3. Monitoring and Identification

Monitoring on all turf areas is on-going and performed throughout the year. Although the focus of this program is weed management, it is also very important to monitor for over-all turf health and vigor. Weed monitoring will primarily be performed in the spring (late April or early May), early summer (mid to late June), and again in late summer or fall (late August to late September).

3.11.4. Prevention

Prevention is the first tactic to maintain weed levels below the set action threshold in turf areas. Turf nutrient levels will be monitored and adjusted to achieve a healthy vigorous stand of grass. Soil compaction will be addressed in areas that are showing signs of compaction, optimum mowing heights and frequencies will be practiced, and appropriate soil moisture will be maintained throughout the summer months.

Additional prevention practices for turf areas include:

- **Adequate fertility levels:** As a general guideline, Turf and Specialty Turf areas will receive between 1 and 4 pounds of nitrogen per growing season (May - October). This will promote active growing dense vigorous turf that can out-compete weed infestation. Typical fertilizing products will have slow release characteristics (e.g., methylated urea, sulfur-coated urea, or polymer-coated urea). Highly soluble materials will be avoided when significant rainfall is forecast.
- **Soil compaction:** Actively manage soil compaction in high traffic areas by mechanical aerification (spring and fall).
- **Mowing height and frequency:** Turf and Specialty Turf will be maintained at the optimum mowing height to encourage a high-density turf canopy and optimum root

growth. Mowing height will be maintained between 2 and 2 ½ inches with a mowing frequency of once a week (April – October).

- **Soil pH:** Soil pH for turf grass management will be maintained between 6 and 7. If it becomes necessary to raise of lower the soil pH, the type of product and rate of application will be determined by soil tests. Typical products to correct low pH levels in the Willamette Valley are dolomitic limestone or calcitic limestone, although these are not suitable for all situations. Avoid applying either material at rates higher than 50lbs per 1000 sq. ft.
- **Over-seeding:** Weak or thin turf areas will be over-seeded to maintain a dense stand of grass that will out-compete invasive weed establishment.
- **Grass selection:** Micro climates and exposure will be considered when determining the proper seed type. As a general rule of thumb, perennial ryegrass will be used in full sun exposures, while fine fescue blends will be used in partially sunny to shady exposures.
- **Water management:** Proper water management is crucial in maintaining dense and vigorous turf stands. Too much irrigation is just as detrimental to turf quality and health as too little irrigation, and supplemental watering must be monitored so that optimum soil moisture is maintained. Drainage issues will be addressed so as not to have extended periods of soil saturation.

3.11.5. Control

Control methods for weeds in turf areas vary by weed class, weed species, and service level. All weeds, regardless of class, will be controlled using the most effective and least toxic method available. Chemical control methods will utilize the least toxic and most effective herbicides and adjuvants available. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.11.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G, as necessary.

3.12. Tree Wells

3.12.1. Description

Barked or mulched tree wells are managed in developed parks and medians primarily to protect the tree's health and the public's safety.

3.12.2. Action Thresholds

Grasses and weeds that have been allowed to grow up and around the tree trunks increase the likelihood of the tree being damaged by mechanical maintenance operations (e.g., mowing, string trimming). This damage to trees can weaken the tree, compromising its health and longevity. Foreign objects left behind by park users have a way of ending up at the base of trees, covered by grass, where they can pose a hazard to both maintenance workers and park patrons. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. The service level of tree wells is dictated by the service level of the surrounding area.

Tree wells in Specialty Landscapes/Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (5% weeds)
Class 3 weeds (5% weeds)

Tree wells in Landscapes/Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (10% weeds)
Class 3 weeds (10% weeds)

Tree wells in Naturalized Landscapes/Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (maintain below 22 inches in height)
Class 3 weeds (maintain below 22 inches in height)

3.12.3. Monitoring and Identification

Monitoring tree wells is on-going and will be performed primarily in the spring (late April or early May), early summer (mid to late June), and again in late summer or fall (late August to late September) These general monitoring times coincide with plant lifecycles and the easiest control periods.

3.12.4. Prevention

- Mulching around tree wells will help in maintaining weed populations below action thresholds. Thick layers of coarse mulching materials are the most effective in controlling weed infestations.
- Planting blue fescue in the tree well is another option that discourages weed growth and significantly reduces the need for mechanical or chemical weed control actions. The short-growing fescue helps prevent weed germination and establishment and it creates a setback between the tree trunk and mechanical operations.

3.12.5. Control

When threshold pest levels have been reached, control strategies will primarily focus on mechanical action. Flaming can be effective when managing newly emerged weeds in late winter before they are established. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.12.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G, as necessary.

3.13. Fence Lines

3.13.1. Description

Within the developed park system fences delineate park property and separate it from private property. Additionally, most sports fields have a system of fencing that delineates the boundaries of the field and many have other fencing that protects other park users from foul balls. In each case, vegetation along these fences must be managed to protect the integrity of the fences and to prevent the intrusion of invasive weeds.

3.13.2. Action Thresholds

Action thresholds for fence lines are established for desired vegetation height rather than for a percent of coverage or number of weeds in an area. All classes of weeds, except for Class 1, are allowed to grow at the base of fences. The key in managing weeds along fence lines is to maintain all vegetation at or below a set height based on the maintenance service level for the park. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. The service level of fence lines is dictated by the service level of the surrounding area.

Fence Lines in Specialty Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (threshold at 3 inches in height)
Class 3 weeds (threshold at 3 inches in height)

Fence Lines in Turf/Naturalized Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (maintain below 22 inches in height)
Class 3 weeds (maintain below 22 inches in height)

3.13.3. Monitoring and Identification

Monitoring fence lines is ongoing throughout the year.

3.13.4. Prevention

- Manage weed height to prevent weeds from setting seed
- String trim along fence lines after spring flush
- Install concrete or rubber mow strips where appropriate, and resources allow
- Plant low-growing groundcovers (e.g., blue fescue) at the base of fence lines

3.13.5. Control

When thresholds have been reached, control strategies will primarily focus on mechanical control actions (e.g., string trimming). Flaming can be effective when managing newly emerged weeds in late winter before they are established. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.13.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record

keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G as necessary.

3.14. Softball Infields

3.14.1. Description

POS staff actively manages over 20 softball infields throughout the park system. Infields are skinned (bare dirt) play surfaces. During play season, skinned infields will be maintained with a smooth surface and low weed threshold levels.

3.14.2. Action Thresholds

Weeds that are actively growing during times of softball play create unsafe conditions for the users, while also decreasing the playability of the field. Annual bluegrass, *Poa annua,* will be allowed a 100% cover during the off season and will be eradicated in early spring by mechanical controls. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints.

The current service level classification for turf areas are listed in the table below. All Sports Fields are considered Specialty Turf (ST)

Sports Fields Location	Service level
Amazon North and South	ST
Amazon #3	ST
Century Fields	ST
Roosevelt Fields	ST
Washington Park Ball	ST
Graham Fields	ST
Ida Patterson Fields	ST
Ascot Park Fields	ST
Maurie Jacobs Park Soccer	ST
Petersen Barn Fields	ST
Trainsong Park Ball	ST

Softball infields (During play season)
Class 1-3 weeds (1% weeds)

Softball infields (during off season)
Class 1 weeds (1% weeds)
Class 2 weeds (20% weeds)
Class 3 weeds (75% weeds)
Class 3 weeds (perennial grasses 5%)

3.14.3. Monitoring and Identification

Weed level monitoring will typically take place in the late fall and winter months when the fields are out of play. This is the time of year when the most troublesome infield weeds start to emerge. During the spring and summer months, monitoring of the fields will be performed on a weekly basis with the emphasis on safety and playability.

3.14.4. Prevention

- Mechanically harrow the infields as soon as conditions allow (late January – February) to disrupt any weeds present.
- Tolerate *Poa annua* on the skinned infields in the late fall. This practice helps to prevent erosion and provide a cover-crop that will minimize germination and establishment of other weeds.

3.14.5. Control

Weeds are generally controlled using a tractor-drawn harrow called a Roterra. While the Roterra is a useful tool for uprooting small weeds (*Poa annua*) and loosening compacted soils, it is not sufficient for chopping weeds with large root systems and thick stems. As a result, any tap-rooted weeds that are difficult to mechanically incorporate into the infield profile because of their size or number will be controlled by hand removal. When large populations of difficult weeds are present, it may be necessary to use a chemical pesticide to get control of the weeds. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.14.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G, as necessary.

3.15. Poles and Other Fixtures within Turf Areas

3.15.1. Description

Throughout the developed park system, numerous infrastructure components are located in turf area. These components range from park lighting poles or utility boxes on parklands to traffic signs in right-of-way medians. The vegetation around these intrusions is managed in order to protect the infrastructure from damage during mowing, and to preserve public safety.

3.15.2. Action Thresholds

Action thresholds for the areas around poles and other fixtures are established for desired vegetation height rather than for a percent of coverage or number of weeds in the area. All classes of weeds, except for Class 1, are allowed to grow at the base of poles and other fixtures. The key in managing weeds in these areas is to maintain all vegetation at, or below, a set height based on the maintenance service level for the park. If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints. The service level of poles and other fixtures in turf are dictated by the service level of the turf area in which the fixture is placed.

Poles and Other Fixtures in Specialty Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (maintain below 3 inches in height)
Class 3 weeds (maintain below 3 inches in height)

Poles and Other Fixtures in Turf/Naturalized Turf
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (maintain below 22 inches in height)
Class 3 weeds (maintain below 22 inches in height)

3.15.3. Monitoring and Identification

Monitoring vegetation around posts and other fixtures is ongoing throughout the year.

3.15.4. Prevention

- Manage weed height frequently to not prevent seeding
- String trim around poles and other fixtures after spring flush
- Install concrete or rubber mow strips where appropriate and resources allow
- Plant low-growing groundcovers such as blue fescue at the base of poles and other fixtures.

3.15.5. Control

When thresholds have been exceeded, control strategies will primarily focus on mechanical control actions such as string trimming. Flaming can be effective when managing newly emerged

weeds in late winter, before they are established. A list of control methods and weed classifications for specific weed species may be found in Appendix G.

3.15.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix G, as necessary.

3.16. Dog Parks

3.16.1. Description

The City of Eugene manages four off-leash dog parks. These areas are clearly posted as dog off-leash areas and they are separated from the rest of the park by a perimeter fence. All four dog parks are heavily used throughout the year and providing adequate turf coverage throughout the year is a maintenance challenge. All the dog parks are adjacent to water bodies and the sites must be managed to reduce onsite erosion and water runoff from the site. Two of the dog parks have cross fencing that helps facilitate the closure of one side for rest and renovation. The newest dog park in the system, at Candlelight Park, has an irrigation system that allows for longer renovation and seed establishment times in the summer months.

3.16.2. Action Thresholds

Only Class 1 weeds and invasive exotic weeds will be actively managed in dog parks. All other weeds listed in the appendices will be allowed and will be accepted as a component of a viable ground cover.

The current service level classification for turf areas are listed in the table below.

Location	Service level
Alton Baker Dog Park	NT
Candlelight Dog Park	T
Amazon Dog Park	NT
Morse Family Farm Dog Park	NT
Washington Jefferson Dog Park	T

Dog Park
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2, 3 and 4 weeds will not be controlled in dog parks.

3.16.3. Monitoring and Identification

Weed monitoring in dog parks is on-going and performed throughout the year. Unlike the monitoring goals for other landscape management areas in the system, the goal of weed monitoring in dog parks is chiefly to maintain adequate vegetative ground cover, and keep Class 1 weeds to a minimum. Monitoring efforts may determine that certain areas within the dog parks need to be closed (outside of typical renovation times) in order to prevent irreversible damage to the remaining ground cover.

3.16.4. Prevention

- Spring mowing to increase shoot density
- Use drought tolerant grass species
- Use grass species that can tolerate heavy foot traffic
- Relieve compaction by either pulling cores or spiking as often as possible
- Identify and correct winter drainage problems
- Close the dog park in extremely wet conditions
- Close damaged areas for renovation

3.16.5. Control

Control actions will be limited to mechanical methods. As specified in Appendix B, all City-operated dog parks are designated as “No Pesticide Zones”.

3.16.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action.

3.17. Community Gardens

3.17.1. Description

POS currently has six Community Gardens with over 325 individual and organizational plots totaling 6.29 acres. The Community Gardens are designated within this manual as No Pesticide Zones, which is a designation that includes each Community Garden site in its entirety and includes a setback of 25 feet from the outside perimeter of each garden site. This designation is similar to that of other high-use parkland that includes all playgrounds, dog parks, and picnic areas. Within each garden, individual community members have access to a plot of City-owned land for a renewable period of one year. Participants in the Community Gardens Program are required to maintain vegetation within their garden plot to program standards. Individual gardeners take measures to control other pests (non-desirable plants, fungal, viral, bacterial, and animal pests) within plots for a variety of reasons, and the expectation placed upon gardeners is that the plots remain in an active, managed state or in a winterized state. The primary reasons for vegetation and pest control are to maintain safe access to garden areas and to maximize the gardens' ability to efficiently produce food crops grown by the program's participants from one growing season to the next.

3.17.2. Action Thresholds

For the control of vegetation, including weeds, the overall service level designation for the Community Gardens Program is covered by the Section 3.11 Naturalized Turf. These service level designations only apply to non-irrigated common areas of the garden sites such as roads, paths, and fence lines. These common areas require regular mechanical treatment (e.g., mowing, string trimming). Regular maintenance of common areas generally occurs between March and November of each year. Off-season (November - March) maintenance is performed on an as-needed basis due to reduced garden use. Community Garden Program rules require that gardeners maintain weeds and other pests in individual garden plots to a standard higher than the surrounding Naturalized Turf Standards and may be found Community Gardens Handbook. The primary reason for weed control in individual plots is to reduce competition with desirable crops,

and the expectation is that gardeners will make a reasonable effort to prevent weeds from going to seed to minimize the spread of weeds into adjacent plots.

The goal of the Community Gardens Program with respect to IPM is to provide space for, and facilitate the production of, vegetables, flowers, or other desirable crops within a manageable and well-maintained area, and to foster the responsible stewardship of shared Community Garden spaces in perpetuity. Within the context of a high-quality space managed for vegetable production, a weed can be considered to be any non-desirable plant that competes for space or other resources that can otherwise be used by desirable crops. When it comes to weed management in individual plots, aesthetic tolerance varies. Some people dislike any weeds in their gardens, while others leave them alone as long as they will not be producing seed. Percent cover for weeds will vary in any given garden plot, but gardeners are required to maintain their plots at a frequency and intensity that limits the spread of any weed from their plot into any other plot in the Community Garden. POS staff oversee the management of weeds and other vegetation in common areas with the goals of limiting the spread of weeds and providing the use and access of common areas.

Rationale for choosing Naturalized Turf for the Community Gardens include:

- Grass and other vegetation must be short enough to allow comfortable foot and wheelbarrow traffic. Mowing every other week accomplishes this goal.
- Dead and diseased plants are removed as needed to limit the spread of plant pests and diseases.
- Grasses and herbaceous weeds must not be allowed to go to seed

For non-plant pests, action thresholds vary considerably from pest to pest in the Community Garden setting. With plant diseases (fungal, bacterial, or viral), action thresholds may occur soon after first occurrence of disease symptoms or the occurrence of climatic conditions (usually temperature and humidity levels) that favor development of the disease. With insects or other animal pests (e.g., aphids, slugs or snails), the action threshold is usually linked to the presence of some critical population level or the appearance of feeding damage on a critical number of the plants within the area being protected.
For the purpose of this document, action thresholds for non-plant pests are considered to be the point at which action (i.e., implementation of pest control strategies) is necessary to minimize plant damage and the loss of desired crops. It is conceivable to consider that action may not be always be triggered every time a potential pest is identified. Sighting a single pest, for example, does not always mean action is required.

More information on selected garden pests and best management practices for their control can be found in Appendix I.

Service Levels for Garden Common Areas (roads, paths, fence lines, and common areas)
Vegetation control will occur to provide safe access and prevent vegetation from going to seed.

The current service level classification for garden common areas are listed in the table below. All Community Gardens are maintained as Naturalized Turf (NT).

Community Garden	Service level	Total plots
Amazon	NT	45
Alton Baker	NT	72
Mathews	NT	71
River House	NT	13
Skinner City Farm	NT	28
Whiteaker	NT	97

Community Garden Plots – vegetation (weeds)
Best management practices for weeds should occur in individual plots to reduce competition for resources and to maximize crop health and production. Control action is required to prevent weeds from going to seed and to prevent weeds from encroaching into adjacent plots.

Community Garden Plots – fungal, bacterial, or viral diseases
Class 1 disease (5% infection)
Class 2 disease (20% infection)

Community Garden Plots – insect pests
Class 1 insect (10% infestation)
Class 2 insect (25% infestation)

3.17.3. Monitoring and Identification

An average of one inspection every month during the principle gardening season will be performed by POS staff or a site coordinator at each garden site to verify compliance with Community Garden Program policies regarding vegetation within garden plots and Naturalized Turf maintenance standards for common areas. For prevention and control techniques to achieve some level of success, gardeners in the program should conduct monitoring for weeds and other pests in their plots in the course of regular, ongoing gardening activities throughout the season. Gardeners can look for:

- the occurrence of pest organisms
- Signs or symptoms of pests (droppings, chewed holes in leaves, spots on leaves, etc.)
- conditions favorable to specific pests
- hiding places for pests
- whether the number of pests or their impacts are increasing or decreasing

3.17.4. Prevention

The following prevention measures will be employed at all Community Gardens with respect to vegetation management:

- POS staff or a site coordinator will oversee required maintenance (mowing, line trimming) within the common areas of the garden sites to provide passable paths, prevent grass and weeds from going to seed, and reduce grass running into garden plots in accordance with Naturalized Turf standards.

- POS staff or a site coordinator will enforce garden policies regarding vegetation within individual plots to minimize the spread of weeds into adjacent plots in accordance with the Community Gardens Handbook.
- POS staff or a site coordinator will also promote the implementation of best management practices that work toward the reduction of impacts associated with plant pests.

Pest populations can be limited by encouraging healthy plant growth, creating inhospitable environments for pests, by removing some of the basic elements pests need to survive, or by blocking their access to an area. Habitat modifications may be used in combination with traps, the exclusion of pests, or by encouraging natural pest predators. Anticipating and preventing pest activity in combination with several pest control methods can achieve long-term results.

To maintain productive garden spaces for current and future participants, the Community Gardens Program places an emphasis on the prevention of pests and recommends the implementation of the following best management practices to maximize plant health and to minimize pest occurrences in garden plots:

- Maintain plots in a working state by cultivating crops in the entire garden plot to minimize hiding places for garden pests.
- Garden plots should be maintained, planted, mulched, or cover cropped, and plots should not be consistently weedy, untended, or filled with debris. Gardeners should work toward building soils to maximize plant health.
- Remove dead or diseased plant material and debris that may serve as hiding places for pests to reduce the incidence, severity, or spread of plant pathogens and pests.
- Rotate crops from one family of plants to another in subsequent growing seasons to interrupt the life cycle of pests by depriving them of associated their host plants.

3.17.5. Control

Community Gardens

No registered pesticides may be used within a Community Garden or within 25 feet of the outside perimeter of Community Garden sites according to the designation of the Community Gardens as No Pesticide Zones (see Appendix B). Emphasis is placed first on the prevention of pests. Subsequent best management practices for the control of pests will rely heavily on cultural practices, and control methods may include one or more physical (mechanical or manual) strategies. Materials other than registered pesticides may also be used when action thresholds have been reached as elements of an integrated approach. Best management practices for a selection of non-plant pests are listed in Appendix K.

The use of combined best management practices can greatly increase the effectiveness of IPM measures. For example, delayed planting of Cucurbits, coupled with row covers, can dramatically reduce damage inflicted from Striped Cucumber Beetles. In addition, the row cover can enhance plant growth which makes the plants less susceptible to damage as they grow larger. Cucumber beetles are prevented from feeding on squash or cucumber vines and the effectiveness of combined best management practices can approach nearly 100 percent. The combination of these strategies also has the added benefit of reducing future impacts from the cucumber beetle

because the beetles' reproductive strategy (laying eggs in the soil around cucurbit plants) has been interrupted – all without the use of pesticides.

Each strategy that may be implemented has certain characteristics that validate its use in dealing with particular pests in gardens. The basis for any control efforts would be a combination of several cultural and mechanical practices intended to make the environment less attractive to the pest or to physically trap or exclude the pest, and the combination of best management practices can achieve both short and long-term success.

Cultural Practices for Community Garden Plots

Cultural methods minimize the conditions that the pest needs to live and reproduce, and also work toward maximizing plant health. Healthy plants are less susceptible to disease, have greater potential to outgrow weeds, and are more likely to resist insects. In addition, the pest populations are reduced because the habitat no longer provides a suitable environment for its continued existence. Cultural practices may include, but are not limited to, cultivation of plant varieties that are well-suited for local growing conditions, including the selection of pest resistant varieties when available, and using appropriate irrigation rates and technique in proper growing areas. Other practices such as using appropriate pruning and trellising techniques, planting at appropriate densities to provide adequate ventilation, planting at appropriate, staggered or varied planting dates, and crop rotations disrupt the pest's association with desired crops. To contribute to soil health, it is important to apply appropriate and well-timed amendments, including composted organic matter, to build healthy soils and foster communities of soil biota, and to implement fall cleanup (the removal of dead or diseased plants) to reduce plant pathogens. Mulching and cover cropping techniques during the dormant period reduce the leaching of nutrients during prolonged winter rains, build soils, and also reduce the spread of weeds and their seed.

Physical Practices for Community Garden Plots

Physical and manual control methods involve mechanical or non-chemical strategies for the control of vegetation such as hoeing, mowing, string trimming, digging, flaming, and hand pulling. These practices can be used by gardeners to control vegetation and prevent the spread of weeds. Other physical techniques can include the removal or the exclusion of other existing pests such as rodent-proofing or removing slugs by hand. The removal of undesirable vegetation, for example, can help to reduce the damage to crops by pests by eliminating hiding places.

Biological Practices for Community Garden Plots

Biological strategies for pest management can include activities focused around using or maintaining insect relationships, animals, birds, soil biota, or competing vegetation to enhance plant health or to control pests. An example of this might include the maintaining numbers of predacious ladybugs by avoiding the use of insecticides and enhancing conditions suitable for their survival. A strategy incorporating ladybugs for the biological control of aphids might plan for some percentage of plants to be infested or include the planting of certain plant species nearby that are more attractive to aphids than desired crops in order to maintain conditions suitable for additional ladybugs.

3.17.6. Evaluation

After prevention methods and subsequent best management practices have been implemented, the evaluation step provides an opportunity to assess the effectiveness of combined strategies and this information will feed back into the implementation or revision of future management actions. The evaluation is based on answers to specific questions such as: Was the pest managed or prevented in such a way as to minimize unacceptable damage to garden crops? Was the method implemented at the right time and in a satisfactory manner? Were there any unintended side effects of the best management practices? Is any further action needed to control the pest within established thresholds? What can be done in the future for this pest situation?

The table of pests in the Community Gardens and their associated best management practices in Appendix I will be reviewed and revised periodically by POS staff.

3.18. Playgrounds

3.18.1. Description

Park operations staff currently manages and monitors over 50 playgrounds for play structure safety compliance and fall surface conditions and compliance.

3.18.2. Action Thresholds

The primary reasons for vegetation management within the soft fall surface areas of playgrounds are to preserve the surface's overall safety characteristics, to comply with ADA and National Playground Safety standards, to eliminate trip hazards, and to preserve the integrity of the fall surface. No weeds will be allowed to persist on any playground fall surface. Control action may be taken when any weeds are observed.

3.18.3. Monitoring and Identification

Monitoring frequencies for playground fall surfaces will be determined by the need to maintain compliance with ADA and National Playground Safety standards, regardless of the service level of the park in which the playground is located. These surfaces will be monitored at least monthly.

3.18.4. Prevention

- Mechanically disrupt the life cycle of weeds before they are established and before they can set seed.
- Eradicate seed sources in close proximity to the fall surfaces
- For non-organic fall surface materials such as sand, minimize organic material contamination from wood chips, soil and other materials.
- For wood chips or other organic fall surface materials, minimize contamination from sand, soil and other materials.

3.18.5. Control

No registered pesticide will be used within a playground (see Appendix B). All controls will be focused on prevention practices, mechanical removal, or rarely, biological control.

3.18.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action.

3.19. Floral Gardens

3.19.1. Description

Four plant collections in the Eugene Parks system have been designated as floral gardens. They are the Owen Rose Garden, the Hendricks Park Rhododendron and Native Plant gardens, the Hayes Memorial Tree Garden, and the Campbell Community Center Wedding Plaza. These gardens showcase different plant collections, and each have unique management goals but the overarching goal in regards to pest management at the floral gardens is that the plant collections are protected and managed at a high level in an effort to showcase the beauty and form of the plants.

3.19.2. Action Thresholds

Given that the management goal of these gardens is to maintain a formal garden aesthetic with show quality flower production, the service levels tend to be set higher than in other landscaped park land. Action thresholds for weeds, insects, and fungal disease are thus typically very low. The main areas of the garden grounds are managed as Specialty Landscapes and Turf, there are however, various service levels that may be present within the same park. Please reference Section 3.8 for management of Landscapes and Section 3.11 for Turf.

If weeds of any class are discovered and occupy a small area (< 2% cover), a control action may be taken in the interest of preventing a larger infestation and the need for more resource intensive actions in the future. If the weed population rises above the action threshold, a control action may be taken. Parks and Open Space staff reserves the right to delay management actions for weeds that are above the action threshold due to resource constraints.

Due to the high susceptibility of the hybrid tea roses to fungal disease and insect damage, action thresholds are set for those pests on roses in the Owen Rose Garden. The Rhododendron lace bug is a new invader in Oregon that threatens Rhododendron and Azaleas and therefore an action threshold has been set for Azalea lace bug in garden landscapes at Hendricks Park. Thresholds for both are summarized below. Please note that not all plant material within the gardens has the same horticultural value, and for the purposes of this section of the IPM Policy and Procedures Manuel, this is represented by the terms High, Medium or Low Value Plants.

See Appendix G and Appendix H for applicable control methods.

High Value Plants
Class 1 fungus (5% infestation)
Class 2 fungus (10% infestation)
Class 1 insects (5% infestation)
Class 2 insects (30% infestation)

Medium Value Plants
Class 1 fungus (10% infestation)
Class 2 fungus (20% infestation)
Class 1 insects (5% infestation)
Class 2 insects (30% infestation)

Low Value Plants
Class 1 fungus (10% infestation)
Class 2 fungus (20% infestation)
Class 1 insects (5% infestation)
Class 2 insects (30% infestation)

- *Note that preventative actions for this class of pest may include chemical applications for Class 2 fungus (10% infestation)

3.19.3. Monitoring and Identification

Monitoring efforts are on-going and performed throughout the year. Monitoring for fungal disease and insect activity will start in January and continue throughout the main growing season, until October.

3.19.4. Prevention

- Minimize soil compaction in both turf and shrub areas
- Test soils for proper pH and adjust as necessary
- Supplement shrub soils with organic matter
- Provide good air circulation around roses by planting plants far enough from one another and by using pruning practices which maintain an open vase shaped.
- Provide deep and infrequent supplemental water, avoid excess watering, and minimize water persistence on leaf and plant tissue
- Mulch planter beds using materials with the largest particle size practical
- Prune to remove all diseased or damaged wood

- Remove all leaves that remain on the plant during winter and remove all leaf material on the ground
- Sanitize pruning tools after using them on a diseased plant
- Provide adequate fertility for rose management
- Maintain natural insect enemies
- Replace disease and insect prone plants with resistant varieties when possible.

3.19.5. Control

All pests, regardless of class, will be controlled using the most effective and least toxic method available. Chemical control methods will utilize the least toxic and most effective pesticides available. A list of control methods and weed classifications for specific weed species may be found in Appendix G. Control methods for fungal and insect pests, along with their associated classification, can be found in Appendix H.

3.19.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix: G and Appendix H, as necessary.

3.20. Small Mammals

3.20.1. Description

Small mammals are present throughout our park system in both natural areas and in developed parks and are generally considered to be an asset. In fact, people visiting parks may anticipate seeing small mammals such as squirrels, river otters, or beaver. Some of these animals are native to this region. Others such as nutria (*Myocastor coypus*) and domestic house pets are not native and have been released into the parks. Over the years, some non-native species have established breeding populations and are increasingly more common in our parks. In addition, many native and non-native small mammal species produce multiple litters per year, and in the absence of

natural predators, have increased their populations to levels where the surrounding environment cannot continue to support them. As their numbers increase, they are forced to expand their range from natural/undeveloped areas into more developed sections of the parks, where their activities can negatively impact the design and functionality of a given park.

Whether native or not, small mammals can pose a problem when their activities begin to impact the intended use of a developed park or natural area, impair efforts to maintain park resources, or create an unsafe condition for the public. When there is a negative impact to a park resource that can create an unsafe condition, POS staff may need to initiate a control strategy to remedy the situation to preserve the public resource and protect public health and safety.

3.20.2. Action Threshold

Action thresholds for small mammals will be established on case-by-case basis. In general, action thresholds will be set to minimize negative small mammal impacts to park resources and/or the surrounding environment. For example, burrowing rodent action thresholds (e.g., moles) will be set to keep some turf areas, such as sports fields, safe for sports field users. On occasion, action thresholds will be established at sites to control nutria, which can threaten the structural integrity of key Stormwater channels and kill young native trees before they become established.

3.20.3. Monitoring

Monitoring for small mammals will be ongoing throughout the year and will take into consideration the characteristics of the individual species. Things to consider when monitoring are feeding habits, nesting sites, reproductive cycles, active periods, territory, and life cycles.

3.20.4. Prevention

- Educate the public on the consequences of releasing non- native species or domesticated animals on public lands.
- Make changes to environmental conditions to discourage specific mammals from inhabiting areas.
- Install barriers to exclude specific mammals from inhabiting areas.

3.20.5. Control

Small mammals such as moles, gophers and ground squirrels can cause significant damage in landscape or garden areas, especially in turf. Damage can be unsightly, make lawns difficult or impossible to maintain, create tripping hazards, or affect valuable assets. The population of small mammals that can be tolerated in a given area is typically quite low, and often zero. When preventive measures are unsuccessful or damage has reached action thresholds, trapping will be employed to limit further impacts to park resources. All control actions used for small mammals will be in accordance with state and local laws.

3.20.6. Evaluation

When a new best management practice (BMP) is being developed or tested in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for record information will be lower in order to balance the costs and benefits of record- keeping activities. Information recorded about control action may include such specifics as control methods, repetition, weather, and anything else deemed important for the particular action. Staff will seek information on management strategies for the specific pest, and that information will influence future management actions. Prior to initiating a control action, staff will review the BMP and the effectiveness of previous actions for control of that pest.

3.21. Waterfowl

3.21.1. Description

Waterfowl are known to frequent parks that have water in or near them, and visitors anticipate seeing these birds and even feeding them. Though geese and ducks are welcome in our parks and are considered an asset under most circumstances, when populations become too high, actions need to be taken in order to preserve water quality, promote bird health, mitigate human health concerns, and prevent degradation to the park and community land.

For the last several years, we have witnessed a continual increase in the population of waterfowl taking up permanent residence within the City's parks. We have seen more and more domesticated geese and ducks showing up in the parks and an annual increase of wild geese (Canada geese) opting to stay year-long instead of migrating. This continual increase in the waterfowl population brings many negative impacts to the park land, waterways, and the birds themselves.

When populations reach a point where the surrounding environment cannot support them, the population becomes unhealthy. Birds start to compete with one another for the limited resources, and some begin to become dependent on the handouts given by park patrons. More often than not, the food that is fed to the birds lacks the proper nutrients required for healthy development. Diets consisting mainly of bread are linked to a syndrome called "Angel Wing," which severely inhibits a bird's ability to fly. More and more cases of this syndrome, which affects both domestic and wild birds, have been witnessed in our parks.

High concentrations of waterfowl that reside in a relatively small area have devastating impacts on the environment in which they live. The high concentration of fecal matter left by the birds is released directly into the water or leached from adjacent land, creating poor water quality (one hundred geese can produce 52 tons of fecal matter annually). High concentrations of fecal matter on the ground cause other concerns as well. The presence of pathogenic bacteria (*E. coli*) in the fecal matter of waterfowl can pose a risk to human health. The most obvious impact caused by high populations of waterfowl is the damage and degradation of the park itself. The unsanitary

and unsightly conditions created by the waterfowl leave the parks in a state that effectively prevents any intended active or passive uses of the parks.

3.21.2. Action Thresholds

Action thresholds for waterfowl will be established on case-by-case basis. Action thresholds for waterfowl populations will be based on the environmental condition of the surrounding landscape and waterway. The focus will be on evaluating bank structure, erosion issues, water quality, adequate ground cover, and the visual and health impacts of fecal matter present on the ground. While it would be more appropriate and more easily quantifiable to have a maximum number of waterfowl that can be supported by a specific combined acreage of land or water, there are insufficient data to develop this kind of quantitative action threshold at this time.

3.21.3. Monitoring and Identification

Monitoring for waterfowl populations will be on-going throughout the year with an emphasis on the months of March, April, and May. While there are resident populations of domesticated and wild waterfowl in many parks, a surge in the number of new wild geese starts to occur in March. These birds will nest nearby and bring their goslings into the parks in late April and May. New goslings become very familiar with humans and welcome any hand-outs given. While some of these young birds will decide to move on, most will take up permanent residence and will not migrate.

3.21.4. Prevention

- **Education** - Educate the public about the negative impacts caused by feeding waterfowl. This can be accomplished with park staff, interpretive signage, and news releases through the media.
- **Relocation**- Remove domestic geese from the park, because they attract wild geese.
- **Exclusion** - Install temporary or permanent barriers at the water's edge.
- **Landscape modification -** Alter the environment by planting natives along the water's edge and by planting non-palatable ground covers as an alternate to lawn.
- **Harassment/hazing -** Use trained dogs to chase waterfowl from the site. Use non-injurious lasers in the morning and evening hours to frighten away waterfowl. Install grids on the water's surface to prevent birds from landing.
- **Nest egg destruction -** In the months of March and April, treat eggs by addling, coating with corn oil, freezing, or puncturing to limit population growth. Note that a Migratory Bird Depredation Permit is required before treating the eggs.

3.21.5. Control

In the event that preventative measures do not keep the waterfowl populations under set thresholds, other strategies will be evaluated. Any lethal control strategy will be vetted through a public process.

3.21.6. Evaluation

When a new best management practice (BMP) is being developed or tested in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of

record-keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the particular action. Staff will seek information on management of pests, and that information will influence future management actions. Prior to initiating a control action, staff will review the BMP and the effectiveness of previous actions for control of that pest.

3.22. Laurelwood Golf Course

3.22.1. Description

Laurelwood Golf Course is a public, 9-hole golf course that is owned by the City of Eugene but maintained and operated by a private vendor (i.e., Golf Course Operator). The developed portion of the Laurelwood Golf Course consists of 60 acres. The nine-hole course includes approximately 45.5 acres of rough, 12 acres of fairways, 0.6 acres of tees/collars, 0.9 acres of greens, and a one acre landscaped parking lot. The chief management goal is to maintain the site as a quality public golf course.

3.22.2. Action Thresholds

Laurelwood Golf Course contains a variety of site types that are described in other sections of this document. The action thresholds associated with these site types apply at Laurelwood Golf Course. Specifically, the action thresholds described in the following sections apply at the course:

- Section 3.7: Hard Surface Areas
- Section 3.8: Landscape Beds
- Section 3.11: Turf Areas
- Section 3.12: Tree Wells
- Section 3.13: Fence Lines

In addition to the action thresholds set forth in above-mentioned sections, the specific action thresholds described below for fungi and insects apply at Laurelwood Golf Course. Fungi and insect classifications, and the BMPs to control these species, can be found in Appendix J.

Greens, Tees, Collars, Fairways, and Approaches
Class 1 fungus (2% infestation)
Class 2 fungus (5% infestation)
Class 1 insects (varies depending on insect, see Appendix J for action thresholds)

Course-wide
Stinging insects: The threshold for nests of stinging insects is 0. If a nest of such a pest is present, action must be taken at the nest site to eliminate the population and reduce the hazardous condition.

3.22.3. Monitoring and Identification

Identification and monitoring of pests is the responsibility of the Golf Course Operator. The Golf Course Operator shall provide monthly pest monitoring reports to the City of Eugene's Golf

Course Contract Manager. The reports shall include the dates of monitoring activities, who performed the monitoring, and which pests were found in what concentrations.

3.22.4. Prevention

Healthy turf grass stands resist damage and/or infestation from pest species. Thus common turf cultural practices as outlined in Section 3.11.4 of this document are employed as a preventative strategy against turf pests. Additional prevention methods at Laurelwood Golf Course include:

- To prevent invasive weed species from entering turf, the following mowing heights are employed: 3/16" to 5/16" on greens, 3/4" on fairways, and 1/2" on tees.
- Class 1 fungus: monitor moisture levels to help control fungus growth at or below threshold. Eradicate small infested areas to prevent a larger infestation. Wash all equipment after use.
- Class 1 insects: disrupt insect's life cycle by using cultural, mechanical, and biological control methods prior to chemical controls. Eradicate small populations to avoid larger infestations.
- Class 1 weeds: Take control actions before weeds flower. Set proper mowing heights to limit growth potential of weeds. Wash all equipment after use to prevent spreading of pests.

3.22.5. Control

All pests, regardless of class, will be controlled using the most effective and least toxic control methods available. In many cases, good cultural or mechanical controls are the best treatment methods for pests as they create healthy turf grass stands which naturally resist infestations. Important cultural practices such as mowing heights, divot repair, dethatching, aerating and fertilizer timing are critical to pest and disease resistance and shall be employed to limit the need for chemical control methods. If chemical control methods are needed, the least toxic and most effective products available will be used. A list of control methods and pest classifications species may be found in the Appendices G-L, however these lists are not meant to be comprehensive, merely to highlight common examples of pests and control methods.

3.22.6. Evaluation

After prevention methods and subsequent best management practices have been implemented, the evaluation step provides an opportunity to assess the effectiveness of combined strategies and provide feedback to inform the implementation or revision of future management actions. Evaluation of the effectiveness of a control strategy is based on answers to specific questions such as: Was the pest managed or prevented in such a way as to minimize unacceptable damage to the golf course? Was the method implemented at the right time and in a satisfactory manner? Were there any unintended side effects of the best management strategy employed? Is any further action needed to control the pest within established thresholds? What preventative measures can be used in the future to avoid or mitigate damage from this pest?

3.23. Native Plant Nursery

3.23.1. Description

The Alton Baker Native Plant Nursery (Nursery) was built in 2006 with the following vision:

> "The vision of the Native Plant Nursery is to enhance the diversity of native plant communities within City of Eugene natural areas by producing genetically local native plant material and to provide the community with an opportunity to learn about the value of native plants through volunteer activities."

The Nursery has an inventory of over 60 species of native forbs, grasses, shrubs, and trees adapted to upland, riparian, and wetland habitats. In general, these species are hard to find commercially. Materials produced are being planted into high and medium quality natural areas, restoration sites, capital project areas, and demonstration landscapes. Two types of plant material are produced: potted plants and seed. The number of potted plants produced varies, but ranges from one thousand to five thousand plants each year. The quantity of seeds produced also varies but has been on the order of 30 to 40 pounds of seed per year in recent years.

As a production facility that provides native plant material to high and medium quality sites, it is important that the plant material is not contaminated with weeds or weed seeds. In order to accomplish this, a lot of resources are expended at the Nursery by POS staff, the site coordinator, interns, and community volunteers to control weeds. The majority of weed management includes physical control efforts such as propane burning of weeds in the gravel areas, mowing, and string trimming of grass and weeds along fence lines and grassy areas, hand pulling in and around potted plants in the shade houses, and hand pulling in and around the forty-one raised beds that are used for seed production. Cultural weed management efforts used include mulching pathways, adjusting watering rates to species/condition needs to minimize overwatering, rotating species among planting beds, etc. Additionally, some chemical weed control is undertaken for specific issues such as control of field bindweed, rust, fungus and other invasive, difficult-to-control pests.

3.23.2. Action Thresholds

The Nursery provides plant material primarily to natural areas with a low tolerance for contaminated plant material, and therefore, is defined as falling within Maintenance Modes A and B, whereby the action thresholds for weeds and other pests are low. In order to set realistic management goals, the Nursery will be considered in two parts: Nursery grounds and Nursery plant material (plants in flats, pots or other containers, and raised beds).

Nursery Grounds

The Nursery grounds includes all areas of gravel, shade house floors, fence lines, grassy areas, and the wooded areas on the south side of the site. These areas all require regular mechanical treatment (e.g., manual weed pulling, mowing, string trimming, or propane burning) in order to keep weeds from going to seed and contaminating the native plant material. Regular maintenance of the Nursery grounds occurs primarily between March and Mid-December of each year. Off-season (mid-December - March) maintenance is performed on an as-needed basis due to reduced Nursery use.

Nursery Grounds – vegetation
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are found.
Class 2 weeds (10% weed cover)
Class 3 weeds (20% weed cover)

Nursery Grounds – insect pests
Control action may be taken when venomous stinging insects pose a safety threat for POS staff, volunteers, or the public.

Nursery Grounds – small mammals
While small mammals are addressed more broadly in Section 3.20 of this manual, the potential for damage by small mammals at the Nursery is greater than in most other areas of the park system, warranting the need to address these pests in more detail in this section.

Small mammals can cause significant damage in nursery settings particularly in the areas where plants are being grown in the ground or in raised beds for seed production. Since small mammals can move readily from the Nursery grounds to the Nursery plant material, both of these areas of the Nursery will be treated the same. Moles, gophers, and voles may use underground tunnels to access the areas where native plants are being grown, sometimes because of the moist soil conditions (in the case of moles) and other times to eat the plant material itself (as with gophers and voles). Squirrels can also cause significant damage from above ground through their caching activities and seem particularly attracted to beds and pots of new, vulnerable seedlings. Since any one of these small mammals can decimate a bed of native plants or newly planted seedlings within a matter of days, the number of small mammals that can be tolerated is quite low.

Preventative measures, such as the installation of physical barriers (chicken wire, plastic bird or deer netting, in-ground sonic emitters), use of pelletized or spray-on repellents, and the reduction of desirable habitat (e.g., trimming of nearby tree branches to limit aerial access to the site for tree squirrels) will be used as a first line of defense.

Action thresholds for small mammals will be established on a case-by-case basis. In general, action thresholds will be set to minimize negative small mammal impacts to native plant material. For example, the presence of a single mole can cause significant damage to both raised and in-ground beds in a very short period of time and may result in action at the first sign of damage. On the other hand, it may take the presence of a number of tree squirrels at the Nursery on a regular basis to cause enough damage to trigger the action threshold.

When preventive measures are unsuccessful or damage has reached action thresholds, trapping will be employed to limit further impacts to native plant materials. All control actions used for small mammals will be in accordance with state and local laws.

More information on selected pests and best management practices for their control can be found in Appendix K: Pest Classifications and BMPs for the Native Plant Nursery.

Nursery Plant Material
For the purposes of IPM management of the Nursery, all containers, half-barrels, raised beds, and in-ground beds that are being used to grow or produce native plant material will be considered in this category. Native plant material, whether potted plant material, bulbs or seed, will be planted out in City Natural Areas that fall within the Maintenance Modes A and B, so it is important that these plant materials are not contaminated with weeds that may ultimately end up invading these natural areas, resulting in the need for action in potentially far more sensitive areas.

Native Plant Material - vegetation
All weed classes: Control action may be taken when any listed weed is < 2% weed cover to provide rapid response to invasions of new exotic species.
Class 1 weeds: Control action may be taken when any Class 1 weeds are observed.
Class 2 weeds (2% combined weed cover)
Class 3 weeds (5% combined weed cover)

Native Plant Material - fungus, bacterial, or viral diseases
Action thresholds will be determined based on the amount of damage to a given species of a single genetic source. For potted material, damage will be determined by considering all of the containers of that species/genetic source as a whole and estimating the percent of containers damaged. In the case of species being grown in raised or in-ground beds, damage will be determined by estimating the percent of that bed that has been damaged.
Class 1 fungus (5% damage).
Class 2 fungus (20% damage)

Native Plant Material – insect and mollusk pests
Action thresholds will be determined based on the amount of damage to a given species of a single genetic source. For potted material, damage will be determined by considering all of the containers of that species/genetic source as a whole and estimating the percent of containers damaged. In the case of species being grown in raised or in-ground beds, damage will be determined by estimating the percent of that bed that has been damaged.
Class 1 insect/mollusk (10% damage)
Class 2 insect/mollusk (25% damage)

Note that while this is covered under the section on the Nursery Grounds, control action may be taken when venomous stinging insects pose a safety threat for POS staff, volunteers, or the public.

Nursery Plant Material – small mammals
While small mammals are addressed more broadly in Section 3.20 of this manual, the potential for damage by small mammals at the Nursery is greater than in most other areas of the park system, warranting the need to address these pests in more detail in this section.

Small mammals can cause significant damage in Nursery settings particularly in the areas where plants are being grown in the ground or in raised beds for seed production. Since small mammals can move readily from the Nursery grounds to the Nursery plant material, both of these areas of

the Nursery will be treated the same. Moles, gophers, and voles may use underground tunnels to access the areas where native plants are being grown, sometimes because of the moist soil conditions (in the case of moles) and other times to eat the plant material itself (as with gophers and voles). Squirrels can also cause significant damage from above ground through their caching activities and seem particularly attracted to beds and pots of new, vulnerable seedlings. Since any one of these small mammals can decimate a bed of native plants or newly planted seedlings within a matter of days, the number of small mammals that can be tolerated is quite low.

Preventative measures, such as the installation of physical barriers (chicken wire, plastic bird or deer netting, in-ground sonic emitters), use of pelletized or spray-on repellents, and the reduction of desirable habitat (e.g., trimming of nearby tree branches to limit aerial access to the site for tree squirrels) will be used as a first line of defense.

Action thresholds for small mammals will be established on a case-by-case basis. In general, action thresholds will be set to minimize negative small mammal impacts to Native Plant Material. For example, the presence of a single mole can cause significant damage to raised and in-ground beds in a very short period of time and may result in action at the first sign of damage. On the other hand it may take the presence of a number of tree squirrels at the Nursery on a regular basis to cause enough damage to trigger the action threshold.

When preventive measures are unsuccessful or damage has reached action thresholds, trapping will be employed to limit further impacts to native plant materials. All control actions used for small mammals will be in accordance with state and local laws.

More information on selected pests and best management practices for their control can be found in Appendix K: Pest Classifications and BMPs for the Native Plant Nursery.

3.23.3. Monitoring and Identification

Monitoring for weeds and other pests will take place at the Nursery in the course of regular, ongoing activities during the period from March through October. Monitoring from mid-December through February will be minimal, because most weeds and other pests are dormant for the winter.

3.23.4. Prevention

To maintain the productivity of the Native Plant Nursery, POS staff will emphasize the prevention of pests and will employ the following best management practices to maximize plant health and minimize pest occurrences at the Nursery:

- Conduct frequent mowing, string trimming, propane burning, or manual weed pulling within the Nursery Grounds to prevent grass and weeds from going to seed and contaminating Native Plant Material. The frequency will vary throughout the year, with spring weed control occurring more often and summer/fall control taking place less regularly.
- Mulch walkways between raised beds using coarse wood chips to prevent weeds and increase longevity of walkways. Monitor walkways periodically and add new wood chips when depth become thin to help suppress weeds

- Maintain shade house floors free of excess dirt and other organic debris to minimize growth of weeds in shade houses that may contaminate native plant material
- Store soil and other stockpiles of materials at the Alton Baker Park maintenance yard in concrete bins. Keep stockpiles weed free by covering them and removing weeds before they go to seed.
- Use physical barriers such as seedling fabric, shade cloth, bird/deer netting, hardware cloth, or sonic emitters to exclude small mammals, birds, and other pests from raised or in ground beds, shade houses, and potted plant material.
- Tools and equipment used in areas with bindweed will be cleaned prior to working in areas not already contaminated.
- To prevent spread of bindweed into City Natural Areas, soil that is found to be contaminated with bindweed will not be used for production at the nursery nor planted out into Natural Areas.
- Remove pests such as snails and slugs by hand when feasible.
- Where feasible, reduce hiding places for pests and minimize conditions that may encourage the presence of pests. Examples include reducing dark damp places for snails and slugs to hide and blocking gaps in roofs, eaves, and crawl spaces of Nursery buildings to minimize colonization by stinging insects, access by small rodents, or use of crawl spaces for nesting (raccoons, opossum).
- Provide the appropriate water for different types of plant material:
    - For raised beds and in ground beds with established plant material provide deep and infrequent supplemental water, avoid excess watering, minimize water persistence on leaf and plant tissue, and adjust sprinkler heads to reduce overspray of walkways and other not planted areas.
    - For raised beds and in ground beds with seedlings or plants that are not well established, water can be more frequent, but should be monitored and adjusted accordingly to avoid excess watering, minimize water persistence on leaf and plant tissue, and reduce overspray of walkways and other non-planted areas.
    - For potted plant material water can be more frequent, but should be monitored and adjusted accordingly to avoid excess watering and minimize water persistence on leaf and plant tissue.
- Encourage healthy plant growth by planting at appropriate densities to provide adequate air flow, rotating plant species to disrupt a pest's association with that particular species or plant-type, and application of appropriate and well-timed soil amendments, including organic compost or composted organic matter.
- Rotate the species being grown in raised beds for seed production every 3-5 years or as needed to reduce the establishment of pests associated with certain species. Rotation of species between beds also allows the removal of contaminated soil if needed and the amendment of beds with new soil.

3.23.5. Control

All pests, regardless of class, will be controlled using the most effective and least toxic method available. Emphasis will be placed first on the prevention of pests. Subsequent best management practices for the control of pests will rely heavily on cultural, physical, and biological practices. Chemical control methods will utilize the least toxic and most effective pesticides available.

Whenever possible, chemicals approved by the Organic Materials Review Institute will be used before more conventional chemicals are employed. A list of control methods and classifications for specific pests may be found in Appendix K.

Cultural Practices for the Native Plant Nursery
Cultural methods minimize the conditions that the pest needs to live and reproduce, and also work toward maximizing plant health. Healthy plants are less susceptible to disease, have greater potential to outgrow weeds, and are more likely to resist insects. In addition, the pest populations are reduced because the habitat no longer provides a suitable environment for its continued existence. Cultural practices may include, but are not limited to, using appropriate irrigation rates and technique in proper growing areas, planting at appropriate densities to provide adequate air flow, planting at appropriate time of year, rotating plant species to disrupt a pest's association with that particular species or plant-type and application of appropriate and well-timed soil amendments, including organic compost or composted organic matter. Mulching of walkways between paths to suppress weeds is another cultural practice that is used at the Nursery.

Physical Practices for the Native Plant Nursery
Physical and manual control methods involve mechanical or non-chemical strategies for the control of vegetation such as mowing, string trimming, propane burning, and manual weed pulling. These practices will be used by staff and volunteers to control and prevent the spread of weeds. Other physical techniques can include the removal or the exclusion of other existing pests such as rodent-proofing or removing slugs by hand. The removal of undesirable vegetation, for example, can help to reduce the damage to native plant material by pests by eliminating hiding places.

If a weed, such as bind weed, becomes so persistent in a raised bed that is becomes impossible to control, production of native seed in that bed should be terminated and the bed "fallowed" for a season. At a minimum, the bed should be covered with shade cloth or other light-inhibiting material for a full growing season. A more vigorous approach may be to dig out all of the soil in a raised bed contaminated with bindweed and start over with fresh, uncontaminated soil. All contaminated soil should be removed off site and disposed of. Note that in this situation, additional control may be needed to keep the target weed from reinvading the bed from deeper soils, small amounts of soil in the frame of the bed, and/or adjacent walkways.

Biological Practices for the Native Plant Nursery
Biological strategies for pest management can include activities focused around using or maintaining insect relationships, animals, birds, soil biota, or competing vegetation to enhance plant health or to control pests. Examples of this include the introduction of ladybugs for the biological control of aphids and the application of nematodes to control insect larvae/grubs. In addition, avoiding the use of insecticides and enhancing conditions suitable for the survival of beneficial insects is another example of a common strategy for biological control.

3.23.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and other information deemed important for the specific

action.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker or supervisor before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix K as necessary.

3.24. Aggressive Stinging Insects

3.24.1. Description

Wasps, hornets, yellow jackets, bumble bees, and honeybees may quickly establish nests above and below ground or in cavities in public spaces. European honeybees typically nest in cavities above the ground and may also form swarms when seeking new nest sites. Not every wasp or bee nest creates a problem for our users or staff. Public threat is dependent on insect species, nest location, time of year and other factors. Yellow jackets, bald-faced hornets, and some hornet species can be particularly aggressive towards people, especially near their nests. Other wasps, such as paper wasps are less aggressive and are more benign depending on location of their nest. Honeybees are generally protective of their nest sites and can sting, but swarms of honeybees generally do not create a large stinging potential as bee behavior is altered when swarming as their primary mission at this stage is to locate a new nest site. The nest location of stinging insects is also important when determining threat. Nests located near walkways, crosswalks, buildings, playgrounds or similar sites are more problematic than those located in remote areas. Nests in areas where vegetation management or restoration planting is being carried out can also create problems. The behavior of some stinging insects may also vary with the time of year. Yellow jackets, for example, will exhibit increased defensive behavior as the season progresses. Normally, yellow jacket and paper wasp colonies only live one season. Honeybee nests usually persist from year to year.

Evaluation:
When wasp or bee nests are discovered on Eugene Parks and Open Space managed lands, staff should evaluate the safety threat they pose. If the nest is considered to create a safety hazard for park users or staff, demarcation and control measures should take place. Nests that create an immediate hazard, such as those near playgrounds, crosswalks, community centers, walkways, trails and work sites, should be addressed as soon as possible. Other criteria that may constitute a hazard are nests that have been disturbed and nests sites with aggressive individuals. Nests occurring within inhabited structures such as community centers create an immediate safety hazard and control of these should be immediately referred to a qualified professional contractor. This manual defines acceptable practices for managing venomous insects such as hornets, wasps, yellow jackets, and honeybees in park landscapes and grounds. While these insects will not always cause problems, their presence in some locations can create immediate and serious public and staff safety issues. Most importantly, individuals with bee and wasp venom allergies may be

presented with life threatening situations if they are stung. To properly address these safety concerns, park employees may be faced with the need to apply insecticides within a short time frame. These control activities and use of insecticide require adherence to the special rules outlined in this manual.

3.24.2. Action Thresholds

Active Use Areas and Trails:
If the nest is considered to create a safety hazard for park users or staff, demarcation and control measures should take place. Nests that create an immediate hazard, such as those near playgrounds, community centers, walkways, crosswalks, trails and work sites, should be addressed as soon as possible. Other criteria that may constitute a hazard are nests that have been disturbed and nests sites with aggressive individuals. In these locations and situations, there is no tolerance the nests of wasps and hornets. As described above, demarcation and public exclusion is the preferred solution of honeybee nests or swarms. If a hazard exists with a honeybee nest, staff must seek a professional contractor for sensitive manual removal of the nest or swarm.

Natural Areas without trails:
If the nest is in an area where people are not expected to be and the nest is not interfering with management activities or the expected use of the site, nests may be tolerated.

3.24.3. Monitoring and Prevention

Monitoring:
Staff will keep an eye out for nests and areas of high concentrations of Aggressive Stinging Insects seasonally within the parks system as a part of their normal duties. When they become aware of an issue involving Aggressive Stinging Insects, their first goal will be to safely locate the nest and assess the threat to the public.

Demarcating nests or swarms:
Where possible, nests or swarms that present an immediate public hazard should be demarcated by either signage, cones, taping, flagging or by other means so that the area of danger can be avoided by park users. This demarcation should stay in place until the nest is eliminated or the swarm leaves on its own or is removed.

3.24.4. Control

Honeybee swarms and nests
When discovered, honeybee swarms should be marked as described above until the bees have been collected or leave the area on their own. Qualified bee removal businesses should be contacted to collect the swarm. Honeybee swarms should not be sprayed with insecticides. Unless location of the nest presents a hazard, honeybee nests should be tolerated where possible. If removal is required, qualified contractors should physically remove nests when feasible.

Spraying wasp and hornet nests
Aerosol jet stream products labeled for use on wasp and hornet nests can be effective against both yellow jackets and paper wasps, but they must be used with extreme caution. Wasps will attack when they sense an application to their nests, and even freeze-type products are not guaranteed to stop every individual. For this reason, extreme caution must be used when nest applications are taking place. The following practices should be adhered to:

- Nests should be sprayed at night or before dawn, when all members of the hive are present and most docile. Daytime spraying is not recommended except in certain emergency cases where the public is not placed at risk from resultant increased hive activity.
- Nests should not be disturbed before treatment. Disturbed nests should not be approached.
- Nest location should be demarcated as described above. Demarcation must be left up until the nest has been eradicated.
- Nests that are situated high in trees, or in otherwise difficult to access locations should be treated by professional contractors, or by qualified staff in the Urban Forestry unit. Do not attempt to control a nest if you cannot easily do so.
- Nests in structures, building voids etc., should be treated by professional contractors only.
- Approved sprays will contain synthetic pyrethroids as their active ingredient. Products with other active ingredients are not approved for use by Parks and Open Space staff.
- Pesticide application notification signage must be placed as per Appendix C in this document.
- Control of aggressive stinging insects shall follow BMP's listed in Appendix L of this document.

Manual removal of Wasp and Hornet nests
Manual removal of wasp and hornet nests by contractors may be used, if the contractor is immediately available, in and park areas including pesticide free parks and areas. The potential risks to the public and staff, cost of removal, and availability of a qualified contactor must be evaluated prior to choosing a manual removal contractor.

Use of traps
When yellow jackets are a continuing serious problem at a site from year to year, use of commercial traps to target emerging queens in the spring can be considered. Trapping queens during the 30- to 45-day emergence period has the potential to provide an overall reduction in the yellow jacket population for the season, The more traps put out in spring on an area-wide basis, the greater the likelihood of reducing the number of nests later in the summer. Usually one trap per acre is adequate in spring for depletion trapping of queens. Use of traps to reduce yellow jacket numbers later in the season is considered ineffective.

3.24.5. Evaluation:

Staff are expected to return to the nest site within 24 hours of the control action to evaluate the success of the action. The action must be repeated until control is achieved or if the control method is ineffective, other methods for control will be evaluated and tried until the threat is gone.

3.25. Street Trees in Public Rights-of-Way

3.25.1. Description:

Street trees are City-owned and -maintained trees growing adjacent to roadways within public rights-of-way. Most often, street trees are situated in a "park strip" between the street and sidewalk, but they can also grow on the opposite side of sidewalks, in specially designed pits/tree wells, or in medians; this will vary depending on the site and property line configurations. Street trees are a critical element of our city's urban forest and provide our community with many important social, economic, and environmental benefits; however, they can also be the source of numerous liabilities/safety concerns. Because of their inhospitable and highly constrained growing environments, street trees often have serious health issues and cause significant problems with surrounding infrastructure/hardscapes, especially sidewalks. When tree/hardscape conflicts occur, severe root pruning or complete removal of the tree is often required. Eugene loses an alarming number of mature street trees each year due to hardscape conflicts (sidewalks, curbs and gutters, streets, and driveways) and severe weather (extended drought, ice and snow storms, and high winds).

3.25.2. Action Thresholds:

The traditional and preferred approach for managing Eugene's street trees has been a combination of proactive planning (establishing the "right tree in the right spot") and timely mechanical maintenance practices (planting, irrigation, pruning, root zone improvements, and removals). Chemical treatments have generally been avoided due to the uncertainties surrounding their impact on human and ecological health and their long-term efficacy. However, Eugene has now reached a point where we are losing so many large, valuable street trees each year that we need to explore management options which can supplement our traditional management methods. One strategy with good potential for helping us to slow down the loss of high-value street trees, involves the limited use of products containing the plant growth regulator Paclobutrazol (PBZ). This compound is a used to divert trees' internal resources away from woody stem/shoot/root growth towards fine fibrous root and leaf development. PBZ has been shown to both slow down tree/root growth and at the same time improve overall tree health and resilience to certain pests and pathogens.

Use of PBZ will be restricted to a small subset of high-value street trees that are at high risk of being lost due to incipient hardscape damage and declining health, and that cannot be effectively treated with traditional (mechanical) methods alone. The action threshold for use of PBZ will be if the treatment has a high likelihood of extending the useful life expectancy of a tree by 15-20 years and reducing the likelihood of damage to surrounding infrastructure.

3.25.3. Prevention:

- Using carefully selected tree species and accounting for localized site conditions and potential tree/infrastructure conflicts (planting the right tree in the right spot)

- Maximizing above- and below-ground growing space and soil volume during site design and construction (using soil cells, suspended sidewalks, and sidewalk joints)
- Optimizing soil quality during site design and construction (avoiding soil compaction)
- Undertaking proactive structural and retrenchment pruning to maximize tree health
- Proactive feeder root management (conducting regular deep sidewalk edging and using irrigation practices that discourage surface rooting)
- Reconfiguring hardscapes and working around tree roots during reconstruction
- Rehabilitation/amendment of soils within the critical root zones of trees

3.25.4. Control:

When a high-value street tree has been identified as having 1) a high likelihood of causing significant damage to adjacent hardscapes within the next 5 years (which cannot be mitigated through mechanical means), and 2) a high likelihood of physically benefitting from treatment with PBZ, then a recommended dose of PBZ will be administered via basal drench or soil injection by a licensed ROW pesticide applicator. All best management practices will be followed to avoid runoff onto impervious surfaces or into the stormwater system.

3.26. Forest Health

3.26.1. Description:

Douglas-fir forests make up over 700 acres (30%) of the cover of the City's natural areas. Forested areas range in size from 5 to over 300 acres and may be isolated or connected to other forestlands. In 2019, following a snowstorm which toppled over 50 mature Douglas-fir trees in Hendricks Park, a Douglas-fir beetle (*Dendroctonus pseudotsugae* (Hopkins)) infestation was confirmed in the park. Douglas-fir beetles have also been confirmed in Spencer Butte Park, and it is assumed they may be present at low levels in all of the City's Douglas-fir forests and woodlands.

Douglas-fir beetles are a native insect to western Oregon conifer forests, and typically populations are present at background levels, scattered throughout forests in areas where trees have been weakened (wind damage, root diseases, etc.). The Douglas-fir beetle is only known to attack Douglas-fir trees and requires trees 10 inches in diameter or larger in order to complete its life cycle. Trees that are successfully attacked by Douglas-fir beetles die within 1-2 years. Following a storm event and the associated increase in downed trees, the beetles can thrive on the blowdown and have a corresponding population outbreak that spreads to healthy trees. Outbreaks generally last 1-3 years and radiate out from original infested areas.

While Douglas-fir beetles are a native insect, at outbreak levels they can significantly damage valuable woodland and forest canopy. Forests and woodlands are managed uniquely according to their ecological and environmental values, setting, land-use history, recreational facilities, and safety concerns. From a pest management standpoint, managing for forest health and canopy preservation is a goal for important forest stands and high-value individual trees.

3.26.2. Action Thresholds:

Management actions for forest health in forests and woodlands include promoting native species, removing habitat-altering invasive species such as English ivy and European blackberry, and providing suitable habitat for wildlife, including insects and their natural predators. However, forests and woodlands are subject to external stressors such as long drought periods and episodic large storm events. These events have become more frequent over the last decade and are resulting in cumulative impacts to forest health at the stand level in places. Routine forest management actions may not be sufficient to address impacts from these irregular but disruptive events.

For Douglas-fir beetle outbreaks, control can be natural (predation by wasps and other beetles), silvicultural (using forest machinery to remove the downed wood from the forest or woodland), or chemical. While natural predators may be present, uncertainty regarding predator and beetle population numbers along with environmental conditions is too great to rely on predators alone to maintain forest health. Silvicultural treatments are a feasible option for commercial timber stands, but not for parklands where protection of the herbaceous and shrub layers are also forest health goals.

The application of an anti-aggregation pheromone is a control option for park, garden, and natural area settings. The pheromone, methylcyclohexenone (MCH), has been isolated from the Douglas-fir beetle and is only known to affect the Douglas-fir beetle. Attaching a pheromone tab to a tree signals to the beetles that the tree is occupied, thus helping to prevent a new attack. Applied at a forest scale, it can decrease the effects of an outbreak on healthy trees following a storm event. Applied to an individual tree, it can help prevent that tree from attack.

Control efforts for Douglas-fir beetle may be undertaken when:

1) Douglas-fir beetle has been confirmed as present in a woodland or forest;
2) Downed wood is present at a density of at least 5 trees/acre;
3) An infestation is determined to have the likelihood to expand, such as following a major storm event or evidence of continued beetle attack on trees surrounding an impacted area; and
4) The woodland or forest stand (or in limited cases, individual tree) is deemed by City staff to be providing a high degree of ecological or environmental benefit, recreation, or aesthetic value that would be significantly impacted by continued loss of forest tree cover.

3.26.3. Monitoring and Identification:

Forest and woodland areas with concentrations of dead trees can be found by walking along trails, by annual review of aerial photos, or during cleanup activities following a storm event. In addition to City surveys, the Oregon Department of Forestry conducts annual flights for forest health and provides access to that information via their website (https://www.oregon.gov/odf/forestbenefits/pages/foresthealth.aspx).

Monitoring for Douglas-fir beetle can be done at any time of year. The main beetle flight period is in April and May, and when beetles are entering new trees or blowdown, their frass (rusty colored sawdust from entrance holes) may be observed on the outer bark. The presence of pouch fungus (*Cryptoporus volvatus*) in old beetle exit holes is also another indicator of Douglas-fir beetle infestation in a given tree. For confirmation, a section of bark can be removed from live or dead trees to search for Douglas-fir beetle galleries. The beetle has a unique gallery pattern that confirms its presence.

3.26.4. Prevention:

The following prevention methods will be employed in woodlands and forests with concentrations of dead or dying trees: post-disturbance surveys for new beetle outbreaks and newly dead trees; if appropriate, reseeding or replanting with species and stock suited to the quality and vegetation type of the woodland or forest.

3.26.5. Control

For mitigating the effects of a Douglas-fir beetle outbreak on a forest or woodland stand or individual tree, MCH may be administered via installation of tabs stapled to trees at a height of 6-12 feet from the ground. Individual trees may be treated, tabs may be installed on a grid in forested areas, or tabs may be installed surrounding the perimeter of the infestation. All pests will be controlled using the most effective and least toxic method available. Best management practices will be followed and the pheromone tabs will be installed by a licensed pesticide applicator.

3.26.6. Evaluation

When a new BMP is being developed or being trialed in a new situation, the standard for recording information will be higher in order to enable staff to reproduce successes and understand failures. When staff implements an existing BMP in a typical situation, the standard for recording information will be lower in order to balance the costs and benefits of record keeping activities. Information recorded about control actions may include such specifics as control method, repetition, weather, and anything else deemed important for the specific action. Staff will seek information on management of pests, and that information will influence future management actions.

Prior to initiating a control action, staff will review the best management practices and the effectiveness of previous actions for control of that pest. All pesticide applicators will get the concurrence of their lead worker before making a chemical application.

Following control actions, and at the appropriate interval for the biology of the specific pest, staff will evaluate the effectiveness of the control action. For chemical applications staff will document the results during the monitoring cycle for the site. Staff will review and update Appendix F (Weed Classifications and BMPs for Mode B, C, and D Natural Areas and Vacant Lands) as necessary.

4. Appendix A: Pesticide-Free Parks Program

What is a pesticide-free park or natural area?
A pesticide-free park or natural area is one that is maintained without the use of registered pesticides. No registered pesticides will be used in a City of Eugene pesticide-free park or natural area *during the calendar year of designation* unless there is a threat to public health or safety or an imminent likelihood of an invasive species outbreak. If it becomes necessary to apply pesticides at a pesticide-free park or natural area, prior to any application made, contact will be established with any group that has signed a Pesticide-Free Park Partnership Agreement for that park. At the end of each calendar year, parks and natural areas that were designated as pesticide-free are reviewed to determine if the site is being managed effectively and if the agreements are being met.

How does a park or natural area become designated as a pesticide-free?
A Neighborhood Association or another officially designated organization must nominate an individual park or natural area for the Pesticide-Free Park Program using nomination forms provided by the City of Eugene's Parks and Open Space Division. As part of the nomination, the nominating organization must identify what contributions it will make each year to the monitoring and manual control of weeds. The Parks and Open Space Division will only agree to enter the nominated park into the Pesticide-Free Park Program if the organization demonstrates a commitment to following-through with monitoring and control of weeds. The City will require the nominating organization to enter into a one-year "Partnership Agreement" with the City that outlines the responsibilities of the nominating organization. The "Partnership Agreement" will be reviewed annually and may be renewed by mutual agreement of the City and the nominating organization.

Current pesticide-free parks are:

1. Awbrey Park
2. Berkeley Park
3. Brewer Park
4. Friendly Park
5. Gilbert Park
6. Milton Park
7. Rosetta Park
8. Scobert Gardens Park
9. Shadow Wood Park
10. Washington Park

5. Appendix B: No Pesticide Zones

Due to the nature of their use and/or their users, some parkland areas have been designated "No Pesticide" zones. The following setbacks for pesticide applications will apply to all City parklands*:

- **Playgrounds and Exercise Stations** - No pesticides will be applied within 25 feet of playgrounds.
- **Dog Parks** - No pesticides will be applied within 25 feet of the outside perimeter of the Dog Park.
- **Picnic Areas** - No pesticides will be applied within 25 feet of picnic facilities.
- **Community Gardens** - No pesticides will be applied inside the gardens or within 25 feet of the outside perimeter of Community Garden sites.
- **Outdoor Swimming Pools, Wading Pools, and Water Spray Features** - No pesticides will be applied within 100 feet of these types of water features during the season when it is open to the public. Exception: applications made to control invasive species in natural areas within the 100-foot buffer at Amazon Pool. Necessary applications shall be made with low-drift methods during off-peak pool use hours.
- **Stormwater catch basins and inlets -** No pesticides will be applied within 5 feet of any catch basin or inlet that leads to the piped Stormwater system.

* Park supervisors may authorize the application of a pesticide in a No Pesticide Zone when there is a threat to public health or safety (e.g., a population of hornets, wasps, yellow jackets, mosquitoes, poison oak, etc.) or in cases where a pest poses a substantial risk to the intended function of parkland or an asset, after reasonable non-pesticide approaches have been considered.

6. Appendix C: Pesticide Notification, Posting Policy, and Posting Templates

If, after following the IPM methodology, a pesticide is determined to be the best control method for a pest or problem, the application area will be posted to notify the public of the intended application.

- Pesticide application signs will be of a standardized design that is easily recognizable to the public and workers.

- Signs shall include the trade and chemical names of the pesticide product to be applied, the date of pesticide application, the specific area(s) in which the pesticide will be/has been applied (e.g., along fence lines or around tree wells), and the contact number for the supervisor of the responsible POS crew.

- Posting Categories:
    - Within 20 ft. of active use areas (e.g., developed park areas, landscape beds, turf areas, official trails, roads, sports fields): signs **shall be posted at least 48 hours** in advance of application. At the time of application, a new sign indicating the application has taken place will be posted, and will be removed no sooner than 24 hours following application. Exception: Cut and wipe, drill and fill, and frill and spray applications are exempt from the 48 hour pre-posting requirement.
    - Greater than 20 ft. from active use areas (natural areas/ off trail areas) or for applications using cut/wipe, drill and fill, and/or frilling methods: signs shall be posted at time of application and removed after product is dry on all treated surfaces.
    - Agricultural lease areas and restricted access areas (medians in between travel lanes with no designed pedestrian access, farm leases, fenced and locked areas such as radio towers and maintenance yards): No postings will be placed prior to applications in these areas. Parks and Open Space keeps records of pesticides used and applications made in these areas.
    - Cut and wipe, drill and fill, and frill and spray applications less than 6 oz herbicide solution that are within 20 ft of natural area trails are exempt from the 48 hour posting requirement.

- Signs shall be posted where reasonably visible to the pubic prior to entry into the application area. When available, a sign will be posted by a park rule sign or kiosk.
- Blue marker dye will be used in all spot spraying applications except in agricultural lease and restricted access areas.
- Posting will not be removed under any circumstances until after the material has dried.
- Staff shall notify known active citizen groups active in the care and management of park sites where a pesticide application is scheduled to occur in an effort to give these groups an opportunity to provide alternatives methods to control the pest.

When there is a threat to public health or safety (e.g., a population of hornets, wasps, yellow jackets, mosquitoes, poison oak, etc.):

- The 48-hour advance notification may be waived.
- In the case of aggressive stinging insect (not honeybee) nests, any City employee may use an approved insecticide to spray a nest if they have been trained on to how to identify, how to properly and safely spray nests, and how to post the sprayed area following application. The responsible POS lead worker will record the application.
- The application area may be cordoned off.
- In these situations, all applications will posted.

With a supervisor's prior approval, the required pesticide application posting may be waived in areas which have little or no public access (e.g., street medians, locked areas). In the case of long duration pest control actions in large natural areas, such as the use of Beetleblock MCH pheromone traps for Douglas fir beetles, information may be posted a centralized informational kiosk and on the City's web site instead of placing temporary signage at trailheads.

Posting Templates:

Notice of Upcoming Fungicide Application

Projected date of application: _____

The City of Eugene Parks and Open Space Division is managing this area in a way that protects native plant species, maintains recreation and aesthetic values, and helps ensure park user safety.

To effectively control the target(s) identified at the right, a fungicide will be carefully applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy, no sooner than 48 hours from the time of this posting.

Posting date and time:_____

Fungicide name and active ingredient:

_____

_____

Target for fungicide:

- ○ Black spot
- ○ Powdery mildew
- ○ Other: _____

Target area:

- ○ Landscape beds
- ○ Other: _____

Application method:

- ○ Broadcast spray
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____ at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Recent Fungicide Application

Date of application: _____

The City of Eugene Parks and Open Space Division is managing this area in a way that protects native plant species, maintains recreation and aesthetic values, and helps ensure park user safety.

To effectively control the target(s) identified at the right, a fungicide was carefully applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy on the above listed date.

Initial posting date and time:_____

Fungicide name and active ingredient:

_____

_____

Target for fungicide:

- ○ Black spot
- ○ Powdery mildew
- ○ Other: _____

Target area:

- ○ Landscape beds
- ○ Other: _____

Application method:

- ○ Broadcast spray
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____ at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Upcoming Insecticide Application

Projected date of application: _____

The City of Eugene Parks and Open Space Division is managing this area in a way that protects native plant species, maintains recreation and aesthetic values, and helps ensure park user safety.

To effectively control the target(s) identified at the right, an insecticide will be carefully applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy, no sooner than 48 hours from the time of this posting.

Posting date and time:_____

Insecticide name and active ingredient:

_____

_____

Target for insecticide:

- ○ Azalea lacebug
- ○ Other: _____

Target area:

- ○ Rhododendrons and Azaleas
- ○ Other: _____

Application method:

- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____ at 541-682-_____ or_____

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Eugene Parks & Open Space

Notice of Recent Insecticide Application

Date of application: _____

The City of Eugene Parks and Open Space Division is managing this area in a way that protects native plant species, maintains recreation and aesthetic values, and helps ensure park user safety.

To effectively control the target(s) identified at the right, an insecticide was carefully applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy on the above listed date.

Initial posting date and time:_____

Insecticide name and active ingredient:

_____

_____

Target for insecticide:

- ○ Azalea lacebug
- ○ Other: _____

Target area:

- ○ Rhododendrons and Azaleas
- ○ Other: _____

Application method:

- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____ at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Upcoming Herbicide Application

Projected date of application: _____

The City of Eugene Parks and Open Space Division is managing this area in a way that protects native plant species, maintains recreation and aesthetic values, and helps ensure park user safety.

To effectively control the target(s) identified at the right, an herbicide will be carefully applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy, no sooner than 48 hours from the time of this posting.

Posting date and time:

_____

Herbicide name and active ingredient:

_____

_____

Blue dye will be mixed with the herbicide to assist the applicator with accuracy, and so the public can see where the herbicide has been sprayed. An additional posting will be placed after the application.

Target for herbicide:

- ○ Annual and perennial weeds
- ○ Invasive species
- ○ Other: _____

Target area:

- ○ Fence lines
- ○ Landscape beds
- ○ Natural area
- ○ Pathways
- ○ Right-of-way
- ○ Tree wells
- ○ Water quality feature
- ○ Other: _____

Application method:

- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____ at 541-682-_____ or _____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Recent Herbicide Application

Date of application: _____

The City of Eugene Parks and Open Space Division is managing this area in a way that protects native plant species, maintains recreation and aesthetic values, and helps ensure user safety.

To effectively control the target(s) identified at the right, an herbicide was carefully applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy on the above listed date.

Initial posting date and time:

_____

Herbicide name and active ingredient:

_____

_____

Blue dye was mixed with the herbicide to assist the applicator with accuracy, and so the public can see where the herbicide has been sprayed.

Target for herbicide:
- ○ Annual and perennial weeds
- ○ Invasive species
- ○ Other: _____

Target area:
- ○ Fence lines
- ○ Landscape beds
- ○ Natural area
- ○ Pathways
- ○ Tree wells
- ○ Water quality feature
- ○ Other: _____

Application method:
- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____
at 541-682-_____ or _____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Herbicide Application

Date of application:_____

This natural area is managed by the City of Eugene Parks and Open Space Division with the objective of establishing or maintaining a diverse, native plant community and preventing the spread of invasive weeds. To achieve this goal, an herbicide will be applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy.

Herbicide name and active ingredient:

_____

Blue dye is mixed with the herbicide to assist the applicator with accuracy, and so the public can see where the herbicide has been sprayed.

Target plant species:

_____

Target area description:

Application method:

- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____
at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Upcoming Herbicide Application

Projected date of application: _____

This natural area is managed by the City of Eugene Parks and Open Space Division with the objective of establishing or maintaining a diverse, native plant community and preventing the spread of invasive weeds. To achieve this goal, an herbicide will be applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy.

Posting date and time: _____

Herbicide name and active ingredient:

_____

Blue dye will be mixed with the herbicide to assist the applicator with accuracy, and so the public can see where the herbicide has been sprayed. An additional posting will be placed after the application.

Target plant species:

_____

Target area description:

Application method:

- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

For questions or concerns contact the supervisor responsible for this area: _____ at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

Notice of Recent Herbicide Application

Date of application: _____

This natural area is managed by the City of Eugene Parks and Open Space Division with the objective of establishing or maintaining a diverse, native plant community and preventing the spread of invasive weeds. To achieve this goal, an herbicide was applied by professional city staff or a licensed contractor in accordance with our Integrated Pest Management Policy.

Initial posting date and time: _____

Herbicide name and active ingredient:

_____

Blue dye was mixed with the herbicide to assist the applicator with accuracy, and so the public can see where the herbicide has been sprayed. This notification will remain in place for a minimum of 24 hours following the application.

For questions or concerns contact the supervisor responsible for this area: _____
at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Target plant species:

_____

Target area description:

Application method:

- ○ Broadcast spray
- ○ Cut and wipe/dab device
- ○ Spot spray
- ○ Other: _____

Eugene Parks & Open Space

Notice of Recent Insecticide Application

Date and time of application: _____

The nest of an aggressive stinging insect, such as a yellow jacket, wasp or hornet, near this location was sprayed with insecticide by the City of Eugene's Parks and Open Space Division to protect public safety. This emergency application follows the established Integrated Pest Management Policy.

Target area:

- ○ Ground nest
- ○ Playground fixture
- ○ Tree nest
- ○ Other: _____

Insecticide name:

_____

_____

Any applications made to playground equipment, picnic tables or benches will be rinsed off with water when the nest has been abandoned.

For questions or concerns contact the supervisor responsible for this area: _____
at 541-682-_____ or_____

Visit www.eugene-or.gov/posipm to learn more about how we manage pests in our parks and natural areas.

Eugene Parks & Open Space

7. Appendix D: Pesticide Use Guidelines

All pest management activities on POS-managed property follow the Integrated Pest Management policy and operations procedures referenced in this document. A variety of preventive and non-chemical pest management strategies are considered before using any pesticide. Approved pesticide applications will be made in circumstances where alternative practices or products have failed to manage the pest below an established threshold level, or the alternate practice is economically unfeasible. Standards of practice for pesticide application on City property will continue to meet or exceed state and federal requirements.

Pesticide applications must be carefully planned to allow for adherence to the pesticide label directions and to minimize any potential impacts on the parkland users. All applications must be approved by the crew or program lead/ contract manager before the posting placed on site and applicators/ contract managers must request approval of the application from the supervisors and section manager in their work section on the day a site is posted for application.
Staff are required to only use pesticides on the Approved Pesticide List in Appendix N. To add a new chemical to the list, staff must submit to their supervisor a request including the name of the pesticide, the pest they want to target, and explanation of the reasons why a pesticide on the existing list can't be used, and information about the relative toxicity of the product versus alternative products. A pesticide may only be approved for use when the following have occurred:

1. The Pesticide has been reviewed by the Pesticide Product Review Team (comprised of Developed Park, EST, and Natural Area Supervisors)
2. The Pesticide has been reviewed against the Salmon Safe High Hazard Pesticide List and a High Hazard variance has been requested and approved if applicable
3. The Pesticide has been added to the Approved Pesticide List
4. The pesticide's SDS has been added to the SDS Database

If a pesticide is chosen as the best control method, care will be taken to:

- Choose the least toxic pesticide and adjuvant that are most appropriate for the situation.
- Notify known pesticide sensitive neighbors to a park
- Post the application according to the Pesticide Posting Policy
- Check application and protective equipment for safety and mechanical problems.
- Apply the material according to the directions on the label and in accordance with state and federal regulations and City policy.
- Apply dye with the pesticide to assist the applicator in making thorough application, and to help parkland users see where the pesticide has been applied.
- Make applications when they are least likely to result in exposure to the public.

- Make applications when the air is calm to minimize drift to non-target areas. Adjustments will be made for spray droplet size and tank pressure when conditions warrant.

- Take into account the expected use of the area for the date and time of proposed applications, such as nearby school activities, recreation activities, athletic field scheduling and all other anticipated uses.

- Develop a plan for addressing questions during the application, this may include adding staff to monitor the application and answer questions or discussing who on staff will stop to answer questions

- Time applications to coincide with the ideal time for weed control whenever possible.

- Employ spot spraying for weeds wherever practical if a broadcast application is not required.

- Record information about all applications of pesticides in the approved tracking system within 3 business days of the application for staff applications or within 10 business days of the application for contractor applications.

8. Appendix E: Weed Classifications and BMPs for Mode A Prairies

Pest species on this list are subject to change in response to new information from the Oregon Department of Agriculture and the observations of City field staff. These lists provide examples of the types of pests that the City is actively managing and is not intended to be an exhaustive or exclusive list.

Weed Classifications

The three classifications of weeds in Mode A Prairies are listed below. Best Management Practices are provided in the Weed Classification Table in this appendix.

1. **Highly invasive.** These weeds have the potential to expand rapidly or form monocultures without intervention. Existing populations require immediate action to control and limit population size and distribution.
2. **Invasive.** These weeds pose a moderate threat to restoration sites. Populations can usually be controlled or contained where they occur. These weeds may not spread rapidly, or do not tend to dominate the plant community. These species may be tolerated in small, dispersed quantities.
3. **Less invasive.** This class of plants is non-native, but they are not considered a serious threat to prairie habitats. They are generally not aggressive invaders, typically do not form monotypic stands, and do not compete aggressively with established native plant communities. There is likely to be some tolerance of these species on mitigation sites in small, dispersed quantities.

Best Management Practices

Thorough site preparation to remove competing vegetation is critical to the successful establishment of native plant communities; and restoration, enhancement, or research project sites may undergo a period of intense monitoring and weed control of at least five years to reduce competition from weeds and facilitate the establishment of native prairie plant communities. The following is a description of the best management practices (BMPs) employed on mitigation bank sites. Multiple BMPs may be employed based on extent of population and density. Each BMP is assigned a code in the table below.

Code	BMP	Description
M1	Remove by hand or use handheld weed removal tools	Pull by hand, dig or uproot and remove plants including roots or rhizomes using a variety of hand tools including weed knives, weed poppers, shovels, hoes, weed wrenches and weed diggers. This treatment is widely used to control isolated invasions or weed occurrences of lower densities. In areas where this treatment causes significant soil disturbance this treatment may be followed with reseeding of native species.
M2	Clipping, cutting, or mowing	Clipping means to cut or remove seed heads and/or fruiting bodies to prevent germination. Mowing may be performed using power trimmers with line or metal brush cutting heads or other mechanized mowing equipment. This treatment is often combined with another treatment, such as M4 or M5, for more effective control. Removal of seed heads or biomass may be required.
M3	Smothering or solarization	Placing a clear plastic over the soil surface to trap solar radiation to kill plants, roots and seeds. Pretreatment may include M2 and tilling. Woven fabric can also be used to smother plants and deprive them of available light but must be kept in

Code	BMP	Description
		place for one to three years. This is a non-selective weed control method, typically used on a small scale on isolated patches of weeds. In areas where this treatment causes significant soil disturbance this treatment may be followed with reseeding or replanting of native species.
M4	Non-selective herbicide application	Includes both spot and boom spray application to target species using broad spectrum herbicide such as glyphosate. In areas where this treatment causes significant disturbance this treatment may be followed with reseeding of native species. This method may also be used as a stump treatment to prevent re-sprouting.
M5	Selective herbicide application (e.g., grass specific or broadleaf specific)	Includes both spot and boom spray application methods to control target species as required. In areas where this treatment causes significant disturbance this treatment may be followed with reseeding of native species. This method may also be used as a stump treatment to prevent re-sprouting.

Weed Classification Table for Mode A Prairies

Scientific Name	Common Name	Weed Classification	Best Management Practices
Agrostis stolonifera/capillaris	creeping bentgrass	1	M1, M3, M4, M5
Aira caryophyllea var. *capillaris*	silver hairgrass	3	M1, M2, M3, M4, M5
Alisma lanceolatum	Narrow leaf waterplantain	3	M1, M3, M4, M5
Alopecurus geniculatus	water foxtail	3	M4, M5
Alopecurus pratensis	meadow foxtail	1	M1, M3, M4, M5
Anagallis arvensis	scarlet pimpernel	3	M1, M3, M4, M5
Anthemis cotula	mayweed chamomile	3	M1, M3, M4, M5
Anthoxanthum odoratum	sweet vernal grass	1	M1, M3, M4, M5
Arrhenatherum elatius	tuber oatgrass	1	M1, M3, M4, M5
Betula cf pendula/pubescens	European birch	1	M1, M4, M5
Brassica rapa	field mustard	3	M1, M3, M4, M5
Briza minor	little quaking-grass	3	M1, M2, M4, M5
Bromus hordeaceus ssp. *hordeaceus*	soft brome	2	M1, M3, M4, M5
Bromus rigidus	ripgut brome	2	M1, M3, M4, M5
Callitriche stagnalis	pond water starwort	3	M1, M3, M4, M5
Calystegia sepium	hedge bindweed	2	M1, M3, M4, M5
Centaurea pratensis	meadow knapweed	1	M1, M4, M5
Centaurium erythraeae	common centaury	3	M1, M3, M4, M5
Cerastium glomeratum	sticky chickweed	3	M1, M3, M4, M5
Cichorium intybus	chicory	3	M1, M3, M4, M5
Cirsium arvense	Canada thistle	1	M1, M3, M4, M5
Cirsium vulgare	bull thistle	1	M1, M4, M5
Conium maculatum	poison hemlock	1	M4, M5
Convolvulus arvensis	field bindweed	1	M4, M5
Crataegus monogyna	English hawthorn	1	M1, M2, M4, M5
Crataegus monogyna x *suksdorfii*	hybrid hawthorn	2	M1, M2, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Crepis capillaris	smooth hawksbeard	1	M1, M3, M4, M5
Cynosurus cristatus	crested dogtail grass	1	M1, M3, M4, M5
Cynosurus echinatus	hedgehog dogtail grass	1	M1, M3, M4, M5
Cyperus eragrostis	tall flat sedge	2	M1, M3, M4, M5
Cytisus scoparius	Scotch broom	1	M1, M4, M5
Dactylis glomerata	orchard grass	1	M1, M3, M4, M5
daucus carota	Queen Anne's lace	1	M1, M3, M5
Dianthus armeria	deptford pink	3	M1, M3, M4, M5
Dipsacus fullonum	teasel	1	M1, M3, M4, M5
Echinochloa crus-galli	large barnyard-grass	1	M1, M3, M4, M5
Fraxinus	**Need to add**		
Galium aparine	catchweed	3	M1, M3, M4, M5
Galium parisiense	wall bedstraw	3	M1, M3, M4, M5
Geranium dissectum	cut-leaved geranium	3	M1, M4, M5
Geranium lucidem	shining geranium	3	M1, M4, M5
Holcus lanatus	velvet grass	1	M1, M3, M4, M5
Hypericum perforatum	St. Johnswort	1	M1, M3, M4, M5
Hypochaeris radicata	false dandelion	1	M1, M3, M4, M5
Juncus marginatus	grass-leaf rush	1	M1, M4, M5
Kickxia elatine	cancerwort	1	M1, M4, M5
Lactuca saligna	willowleaf lettuce	3	M1, M3, M4, M5
Lactuca serriola	prickly lettuce	2	M1, M3, M4, M5
Lamium purpureum	red dead nettle	3	M1, M3, M4, M5
Lathyrus aphaca	yellow vetch	3	M1
Lathyrus latifolius	sweet pea (perennial)	3	M1, M3, M4, M5
Lathyrus sphaericus	green pea	3	M1, M3, M4, M5
Leontodon taraxacoides	hairy hawkbit	2	M1, M3, M4, M5
Lepidium campestre	field peppergrass	2	M1, M3, M4, M5
Leucanthemum vulgare	oxeye daisy	1	M1, M3, M4, M5
Linum bienne	narrow leafed flax	2	M1, M2, M4, M5
Lolium multiflorum	annual ryegrass	1	M1, M3, M4, M5
Lolium perenne	perennial ryegrass	1	M1, M3, M4, M5
Lotus corniculatus	bird's foot trefoil	1	M1, M3, M5
Lysimachia nummularia	monkey wort	2	M1, M3, M4, M5
Lythrum hyssopifolium	hyssop loosestrife	2	M1, M3, M4, M5
Lythrum portula	water-purslane	2	M1, M3, M4, M5
Lythrum salicaria	purple loosestrife	1	M1, M3, M4, M5
Malus x *domestica*	domestic apple	3	M1, M3, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Melilotus alba	white sweet clover	2	M1, M3, M5
Mentha pulegium	pennyroyal	1	M1, M2, M4, M5
Myosotis discolor	yellow & blue forget me not	3	M1, M3, M4, M5
Parentucellia viscosa	yellow glandweed	3	M1, M2, M3, M4, M5
Phalaris aquatica	Harding grass	1	M1, M2, M3, M4, M5
Phalaris arundinacea	reed canary grass	1	M1, M2, M3, M4, M5
Plantago lanceolata	English plantain	2	M1, M3, M4, M5
Plantago major	common plantain	2	M1, M3, M4, M5
Poa annua	annual bluegrass	2	M1, M3, M4,
Polygonum persicaria	spotted lady's thumb	2	M1, M4, M5
Polypogon monspeliensis	rabbit foot grass	2	M1, M3, M4, M5
Prunella vulgaris var. *vulgaris*	non-native self-heal	2	M1, M3, M4, M5
Prunus avium	sweet cherry	2	M1, M2, M4, M5
Prunus sp.	plum	2	M1, M3, M4, M5
Pyrus communis	pear	2	M1, M3, M4, M5
Pyrus malus	apple	3	M1, M3, M4, M5
Ranunculus arvensis	field buttercup	3	M1, M3, M4, M5
Ranunculus repens	creeping buttercup	1	M1, M3, M4, M5
Rosa eglanteria	sweetbrier rose	2	M1, M2, M5
Rosa multiflora	many flowered rose	2	M1, M2, M5
Rubus armeniacus	Armenian blackberry	1	M1, M2, M5
Rubus laciniatus	evergreen blackberry	1	M1, M2, M5
Rumex acetosella	sheep sorrel	1	M1, M3, M5
Rumex conglomeratus	clustered dock	1	M1, M3, M5
Rumex crispus	curly dock	1	M1, M3, M5
Schedonorus phoenix	tall fescue	1	M1, M2, M3, M4, M5
Senecio jacobaea	tansy ragwort	1	M1, M3, M4, M5
Senecio sylvaticus	wood groundsel	1	M1, M3, M4, M5
Senecio vulgaris	old-man-in-the-spring	1	M1, M3, M4, M5
Sherardia arvensis	blue field-madder	2	M1, M3, M4, M5
Sisyrinchium californicum	yellow-eyed grass	3	M1, M3, M4, M5
Solanum dulcamara	bitter nightshade	1	M1, M3, M4, M5
Solanum nigrum	black nightshade	1	M1, M3, M4, M5
Sonchus asper	prickly sow-thistle	1	M1, M3, M4, M5
Sorghum halapense	Johnson grass	1	M1, M3, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Spergula arvensis	stickwort	2	M1, M3, M4, M5
Spergularia rubra	red sandspurry	2	M1, M3, M4, M5
Stellaria longipes	long stalk starwart	2	M1, M3, M4, M5
Stellaria media	chickweed	2	M1, M3, M4, M5
Taraxacum officinale	dandelion	2	M1, M3, M4, M5
Torilis arvensis	hedge parsley	2	M1, M3, M4, M5
Trifolium dubium	least hop clover	2	M1, M3, M5
Trifolium hybridum	alsike clover	2	M1, M3, M5
Trifolium pratense	red clover	2	M1, M3, M5
Trifolium repens	white clover	2	M1, M3, M5
Trifolium subterraneum	subterraneum clover	2	M1, M3, M5
Triticum aestivum	wheat	3	M1, M2, M4, M5
Verbascum blattaria	moth mullein	2	M1, M3, M4, M5
Veronica arvensis	common speedwell	2	M1, M3, M4, M5
Vicia cracca	bird vetch	3	M1, M3, M5
Vicia hirsuta	hairy vetch	3	M1, M3, M5
Vicia sativa	common vetch	3	M1, M3, M5
Vicia tetrasperma	slender vetch	3	M1, M3, M5
Vulpia bromoides	barren fescue	1	M1, M2, M3, M4, M5
Vulpia myuros	rat-tail fescue	1	M1, M2, M3, M4, M5
Vulpia sp. (annual)	annual fescue	1	M1, M2, M3, M4, M5

9. Appendix F: Weed Classifications and BMPs for Mode B, C, and D Natural Areas and Vegetated Stormwater Facilities

Pest species on this list are subject to change in response to new information from the Oregon Department of Agriculture and the observations of City field staff. These lists provide examples of the types of pests that the City is actively managing and is not intended to be an exhaustive or exclusive list.

There are three classifications of weeds in Natural Areas, Vacant Lands and Vegetated Stormwater Facilities. Weed classifications and best management practices for Mode A prairies can be found in Appendix E.

1. Highly invasive: these weeds exist in populations of limited size and distribution and have the potential to expand rapidly without intervention.
2. Moderately invasive: populations can be controlled or contained where they occur, or they can be excluded from individual City natural areas.
3. Slow spreading invasive or considered widespread, difficult to control due to biology, and/or beyond the potential for City-wide eradication.

Maltese or yellow starthistle *Centaurea* sp.	1	Hand pull; foliar spray (triclopyr) prior to seed formation
Knapweed (meadow) *Centaurea praetensis*	1	Biocontrol release. per ODA guidelines in populations larger than acre, based site mode priority and availability. Foliar spray (0.46% aminopyralid, (0.6oz per gallon)) prior to bolting. Mow during early flowering, prior to seed formation.
Old Man's Beard *Clematis vitalba*	2	Hand pull smaller patches, taking care to remove all roots. Main root may need to be dug. Cut and wipe (100% glyphosate) prior to flowering, or foliar spray (2% glyphosate) in late summer; or mow/string trim in fall/winter, apply foliar spray (triclopyr or glyphosate) in early spring.
Knotweeds *Fallopia spp.*	1	Foliar spray (1.5% glyphosate or triclopyr) prior to dormancy, in early fall.
Amur honeysuckle *Lonicera maackii*	1	Hand pull smaller plants; cut & wipe (25% glyphosate or triclopyr) or foliar spray (2% glyphosate or triclopyr) larger plants.
Invasive primrose-willows *Ludwigia hexapetala* *Ludwigia peploides*	1	Manually remove aquatic plants that are sparse, are growing among other desired vegetation, and/or do not have enough above water plant

		surface to make an herbicide application. Foliar spray plants growing along shorelines and in dense aquatic mats (2-3% glyphosate) when the plants are in flower but have not yet gone to seed. Imazamox (3%) may be used in waterways with no or few native aquatic, emergent, or riparian native plants and which don't have drinking water downstream.
Purple loosestrife *Lythrum salicaria*	1	Cut & wipe, foliar spray (1.5% glyphosate or triclopyr), biocontrol release per ODA guidelines.
Yellow floating heart *Nymphoides peltata*	1	Foliar spray with imazapyr or imazamox and a wetting agent (e.g. Competitor) prior to flowering. Extreme caution should be taken to minimize water disturbance by boat wake or other nearby activity or weather conditions, which will easily wash herbicide off leaf surfaces.
Sulphur cinquefoil *Potentilla recta*	1	Foliar spray (2% triclopyr) during rosette stage in spring.
False brome *Brachypodium sylvaticum*	2	Mow/string trim to prevent flowering (2-3X), foliar spray (1.5% glyphosate or approved grass-specific herbicide) during growing season
Canada and bull thistle *Cirsium arvense* and *C. vulgare*	2	Foliar spray (0.46% aminopyralid, 0.6oz per gallon) in spring, ideally prior to bolting. Use 2% triclopyr during flower or after frost.
Poison hemlock *Conium maculatum*	2	Foliar spray (0.46% aminopyralid 0.6 oz per gallon)
Yellow-flag iris *Iris pseudacorus*	2	Spray with 5% glyphosate, 1% Agridex. Imazamox (1-3%) may be used in waterways with no or few native aquatic, emergent, or riparian native plants and which don't have drinking water downstream.
Yellow archangel *Lamiastrum galeobdolon*	2	Dig up roots manually, removing all fragments. Foliar spray while actively growing (triclopyr, glyphosate or a mixture).
Reed Canarygrass and Harding Grass *Phalaris arundinacea.* and *Phalaris aquatica*	2	Mow prior to June 15 to prevent flowering, foliar spray (3% glyphosate) after regrowth.
Italian arum *Arum italicum*	3	Hand dig in spring or foliar treatment using glyphosate or triclopyr either in fall or April/May
Non-native bindweeds, hedge bindweed (*Calystegia sepium)* and field bindweed *(Convolvulus arvensis)*	3	Hand pull before infestations become too large. Repeated hand pulling is necessary since root

		system is extensive. Covering areas with weed fabric to control bindweed may be another control option. In areas of heavy infestation in high quality areas or within new plantings, foliar spray (2-3%) or wipe (50%) with glyphosate.
Ivy-leaf Cyclamen *Cyclamen hederifolium*	3	Manual removal; foliar spray (2% triclopyr, 4% glyphosate mixture, surfactant (silicon-based or "Competitor"))
Scot's broom *Cytisus scoparius*	3	Weed Wrench plants smaller than 1.5" in diameter, cut/ mow plants larger than 1.5" diameter in late summer; foliar herbicide application in spring with aminopyralid or 2% triclopyr summer- fall for populations larger than 1 acre. Biocontrol release per ODA guidelines in populations larger than 1 acre or populations which spread beyond parkland, based site mode priority and availability.
Teasel *Dipsacus sp.*	3	Cut or mow flowering plants at base during full flower but prior to seed formation or 2% foliar triclopyr prior to flowering (within 25 feet of water) or aminopyralid .46% foliar spray in spring (25 feet or more from water)
Fennel *Foeniculum sp.*	3	Cut or mow flowering plants at base during full flower but prior to seed formation or 2-5%% foliar glyphosate + .5-1% triclopyr combination prior to flowering (Feb.- March).
Shining crane's bill *Geranium lucidum*	2	Repeated torching during winter and spring; hand pulling; foliar spray (triclopyr) prior to seed formation.
Stinky Bob *Geranium robertianum*	2	Repeated torching during winter and spring, hand-pulling; foliar spray (triclopyr) prior to seed formation.
English ivy *Hedera helix*	3	Manual removal; foliar spray (2% triclopyr, 4% glyphosate mixture, surfactant (silicon-based or "Competitor"))
Parrot feather *Myriophyllum aquaticum*	3	Manually remove plants that are sparse or growing among other desired vegetation. Foliar spray with 1-3% imazamox and a wetting agent (e.g. Competitor) early in season and again late in season, if needed
Non-native perennial grasses	3	Mow or foliar spray prior to seed formation; foliar spray (1.5-2%

Festuca sp., Agrostis sp., Dactylis sp., Arrhenatherum sp., etc.		glyphosate or approved grass-specific herbicide) during growing season.
Nuisance tree species: Ash, *Fraxinus sp.* Apple*, Malus X* Black locust, *Robinia pseudoacacia* Cherries and plums, *Prunus avium, Prunus spinose, Prunus domestica, Prunus sp.* Elms*, Ulmus glabra, Ulmus procera, Ulmus pumila* English hawthorn, *Craetegus monogyna and hybrids* Horse chestnut*, Aesculus hippocastanum* Norway maple, *Acer platanoides* Pear, *Pyrus communis* Tree of heaven, *Ailanthus altissima* Black walnut, *Juglans nigra* Willows, *Salix sp.*	3	Hand pull if small. Cut and grind medium-large diameter stumps when feasible. Cut and wipe, frill, or drill & fill suckering species with 50% triclopyr amine. Make basal applications of 33% triclopyr ester with modified vegetable oil ("Competitor") for resprouts up to 6" diameter. Milestone may be used in the spring on English hawthorn. Do not apply herbicide to plants bearing edible, ripe fruit, such as apple, pear or cherry.
Nuisance shrub species: English laurel, *Prunus laurocerasus* Portugeuse laurel*, Prunus lusitanica* Spurge laurel, *Daphne laureola* English holly, *Ilex aquifolium* Privet, *Ligustrum sp.* Cotoneaster, *Cotoneaster sp.* Pyrocantha*, Pyrocantha sp.* Photinea*, Phoetinea sp.*	3	Hand pull if small. Cut and stump grind in areas accessible to equipment. In areas not accessibly to equipment, cut and wipe suckering species with undiluted triclopyr amine or frill with 1:1 solution. Basal applications of 50% triclopyr ester with modified vegetable oil ("Competitor") for shrubs up to 6" diameter.
Lesser celandine *Ranunculus ficaria*	3	Dig individual plants to get tubers and don't shake soil from roots. Foliar spray (1.5% glyphosate or triclopyr, or 0.46% aminopyralid) prior to seed formation.
Armenian blackberry *Rubus armeniacus* European blackberry *Rubus vestitus*	3	Mow to control flowering, spot spray in mid-summer through late-fall (2% triclopyr); or springtime application ((0.46% aminopyralid, 0.6oz per gallon) when needed to follow up on fall mowing treatments from the previous year. Do not mow mature plants between. April 1st and July 15th. Do not apply herbicide to plants that have flowers or ripe fruit.
Tansey *Senecio jacobea*	3	Dig up plants in small infestations or apply 1.5% foliar glyphosate prior to flowering
Periwinkle *Vinca* sp.	3	Late summer to fall foliar herbicide application (1.5% triclopyr, 3% glyphosate mixture with silicone-based or "Competitor" surfactant).
Native shrubs or trees; includes poison oak, Oregon ash, big leaf maple, black cottonwood, hawthorn (see Section 1.1 for more information)	n/a	Manual removal where possible. Mowing/mastication. Mature plants may require cut & wipe (50% triclopyr), or foliar application (2%

		triclopyr or 14% fosamine "Krenite")

10. Appendix G: Weed Classifications and BMPs for Developed Parkland, Vacant Land and Right-of-Way

Pest species on this list are subject to change in response to new information from the Oregon Department of Agriculture and the observations of City field staff. These lists provide examples of the types of pests that the City is actively managing within developed parks, right of way areas, and park features such as Landscape Beds, Medians, Turf Areas, Tree Wells, Fence Lines, Softball Infields, Hard Surface Areas, and new parks undergoing construction. This is not intended to be an exhaustive or exclusive list.

There are three classifications of weeds in Developed Parkland, Vacant Lands and Right-of-Way:

1. Highly invasive; has potential for eradication from all City landscape and median areas. These weeds exist in populations of limited size and distribution and have the potential to expand rapidly without intervention.
2. Populations can be controlled or contained where they occur, or they can be excluded from individual landscape and median areas.
3. Considered widespread with and beyond the potential for eradication City-wide.

Code	BMP	Description
M1	Remove by hand or use handheld weed removal tools	Pull by hand, dig or uproot and remove plants including roots or rhizomes using a variety of hand tools including weed knives, weed poppers, shovels, hoes, weed wrenches and weed diggers. This treatment is widely used to control isolated invasions or weed occurrences of lower densities. In areas where this treatment causes significant soil disturbance this treatment may be followed with reseeding or replanting.
M2	Clipping, cutting, or mowing	Clipping means to cut or remove seed heads and/or fruiting bodies to prevent germination. Mowing may be performed using power trimmers with line or metal brush cutting heads or other mechanized mowing equipment. This treatment is often combined with another treatment, such as M4 or M5, for more effective control. Removal of seed heads or biomass may be required.
M3	Smothering or solarization	Placing a clear plastic over the soil surface to trap solar radiation to kill plants, roots and seeds. Pretreatment may include M2 and tilling. Woven fabric can also be used to smother plants and deprive them of available light but must be kept in place for one to three years. This is a non-selective weed control method, typically used on a small scale on isolated patches of weeds. In areas where this treatment causes significant soil disturbance this treatment may be followed with reseeding or replanting.
M4	Non-selective herbicide application	Includes both spot and boom spray application to target species using broad spectrum herbicide such as glyphosate. In areas where this treatment causes significant disturbance this treatment may be followed by reseeding or replanting. This method may also be used as a stump treatment to prevent re-sprouting.

M5	Selective herbicide application (e.g., grass specific or broadleaf specific)	Includes both spot and boom spray application methods to control target species as required. In areas where this treatment causes significant disturbance this treatment may be followed with reseeding of native species. This method may also be used as a stump treatment to prevent re-sprouting.

Scientific Name	Common Name	Weed Classification	Best Management Practices
Agrostis stolonifera/capillaris	creeping bentgrass	3	M1, M3, M4, M5
Ailanthus altissima	tree of heaven	1	M1, M4, M5
Aira caryophyllea var. *capillaris*	silver hairgrass	2	M1, M3, M4, M5
Alisma lanceolatum	narrow leaf waterplantain	3	M1, M3, M4, M5
Alopecurus geniculatus	water foxtail	2	M1, M3, M4, M5
Alopecurus pratensis	meadow foxtail	1	M1, M3, M4, M5
Anagallis arvensis	scarlet pimpernel	3	M1, M3, M4, M5
Anthemis cotula	mayweed chamomile	2	M1, M3, M4, M5
Anthoxanthum odoratum	sweet vernal grass	1	M1, M3, M4, M5
Anthriscus caucalis	bur chervil	2	M1, M3, M4, M5
Acer platanoides	Norway maple	2	M1, M4, M5
Arrhenatherum elatius	tuber oatgrass	1	M1, M3, M4, M5
Bellis perennis	English daisy	2	M1, M5
Betula cf pendula/pubescens	European birch	1	M1, M3, M4, M5
Brachypodium sylvaticum	false brome	1	M1, M3, M4, M5
Brassica rapa	field mustard	2	M1, M3, M4, M5
Briza minor	little quaking-grass	3	M1, M2, M4, M5
Bromus hordeaceus ssp. *hordeaceus*	soft brome	2	M1, M3, M4, M5
Bromus rigidus	ripgut brome	2	M1, M3, M4, M5
Callitriche stagnalis	pond water starwort	3	M1, M3, M4, M5
Calystegia sepium	hedge bindweed	2	M1, M3, M4, M5
Cardamine oligosperma	little western bittercress	3	M1, M3, M4, M5
Carex leporina	hare's foot sedge	2	M1, M3, M4, M5
Centaurea pratensis	meadow knapweed	1	M4, M5
Centaurea sp.	maltese or yellow starthistle	1	M4, M5
Centaurium erythraeae	common centaury	3	M1, M3, M4, M5
Cerastium glomeratum	sticky chickweed	3	M1, M3, M4, M5
Cerastium vulgatum	mouse ear chickweed	3	M1, M3, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Cichorium intybus	chicory	2	M1, M3, M4, M5
Cirsium arvense	canada thistle	1	M1, M3, M4, M5
Cirsium vulgare	bull thistle	1, 2	M1, M3, M4, M5
Clematis vitalba	old man's beard	1	M4, M5
Conium maculatum	poison hemlock	1	M4, M5
Convolvulus arvensis	field bindweed	1, 3	M4, M5
Crataegus monogyna	english hawthorn	1	M4, M5, M2, M1
Crataegus monogyna x *suksdorfii*	hybrid hawthorn	2	M4, M5, M2, M1
Crepis capillaris	smooth hawksbeard	1	M1, M3, M4, M5
Cynosurus cristatus	crested dogtail grass	1	M1, M3, M4, M5
Cynosurus echinatus	hedgehog dogtail grass	1	M1, M3, M4, M5
Cyperus eragrostis	tall flat sedge	2	M1, M3, M4, M5
*Cyperus esculentu*s	yellow nutsedge	2	M1, M3, M4, M5
Cytisus scoparius	scotch broom	1, 3	M1, M3, M4, M5
Dactylis glomerata	orchard grass	1	M1, M3, M4, M5
dacus carota	queen anne's lace	1	M1, M3, M4, M5
Dianthus armeria	deptford pink	3	M1, M3, M4, M5
Digitaria sanguinalis	large crabgrass	3	M1, M3, M4, M5
Dipsacus fullonum	teasel	1, 3	M1, M3, M4, M5
Echinochloa crus-galli	large barnyard-grass	1, 2, 3	M1, M3, M4, M5
Eleocharis quadrangulata	angled spike rush	2	M1, M3, M4, M5
Elytrigia repens	quackgrass	3	M1, M3, M4, M5
Epilobium ciliatum ssp.	fireweed	2	M1, M3, M4, M5
Equisetum arvense	horsetail	1	M1, M2, M3, M4
Erodium cicutarium	red stem filaree	1	M1, M3, M4, M5
Euphorbia (=Chamaesyce) maculata	spotted spurge	3	M1, M3, M4, M5
Euphorbia supina	prostrate	3	M1, M3, M4, M5
Fallopia spp.	knotweeds	1	M1, M3, M4, M5
Festuca sp., Agrostis sp., Dactylis sp., Arrhenatherum sp., etc.	non-native perennial grasses	3	M1, M3, M4, M5
Galium aparine	catchweed	2	M1, M3, M4, M5
Galium parisiense	wall bedstraw	2	M1, M3, M4, M5
Geranium dissectum	cut-leaved geranium	1	M1, M3, M4, M5
Geranium lucidum	shining geranium	1	M1, M3, M4, M5
Geranium robertianum	stinky bob	2	M1, M3, M4, M5
Gnaphalium uliginosum	marsh cudweed	3	M1, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Hedera helix	english ivy	1	M1, M3, M4, M5
Heracleum mantegazzianum	giant hogweed	1	M4, M5
Holcus lanatus	velvet grass	1	M1, M3, M4, M5
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	2	M1, M3, M4, M5
Hypericum perforatum	St. John's wort	1	M1, M3, M4, M5
Hypochaeris radicata	false dandelion	1, 2, 3	M1, M3, M4, M5
Iris pseudacorus	yellow-flag iris	2	M1, M2, M5
Juncus marginatus	grass-leaf rush	1	M1, M3, M4, M5
Kickxia elatine	cancerwort	1	M1, M3, M4, M5
Lactuca saligna	willowleaf lettuce	1	M1, M3, M4, M5
Lactuca serriola	prickly lettuce	1, 3	M1, M3, M4, M5
Lamiastrum galeobdolon	yellow archangel	1	M1, M3, M4, M5
Lamium purpureum	red dead nettle	3	M1, M3, M4, M5
Lathyrus aphaca	yellow vetch	3	M1
Lathyrus latifolius	sweet pea (perennial)	3	M1, M3, M4, M5
Lathyrus sphaericus	green pea	3	M1, M3, M4, M5
Leontodon taraxacoides	hairy hawkbit	1	M1, M3, M4, M5
Lepidium campestre	field peppergrass	2	M1, M3, M4, M5
Leucanthemum vulgare	oxeye daisy	1	M1, M3, M4, M5
Linum bienne	narrow leafed flax	2	M1, M2, M4, M5
Lolium multiflorum	Italian ryegrass	1	M1, M3, M4, M5
Lolium perenne	perennial ryegrass	1	M1, M3, M4, M5
Lotus corniculatus	bird's foot trefoil	2	M1, M3, M4, M5
Ludwigia hexapetala	Uruguayan waterprimrose	2	M1, M2, M5
Ludwigia peploides	primrose-willow	2	M1, M2, M5
Lysimachia nummularia	monkey wort	2	M1, M3, M4, M5
Lythrum hyssopifolium	hyssop loosestrife	1	M1, M3, M4, M5
Lythrum portula	water-purslane	1	M1, M3, M4, M5
Lythrum salicaria	purple loosestrife	1	M1, M3, M4, M5
Malus x *domestica*	domestic apple	3	M1, M3, M4, M5
Mazus japonicus	Japanese mazus	2	M1, M3, M4, M5
Medicago lupulina	black medic	3	M1, M3, M4, M5
Melilotus alba	white sweet clover	2	M1, M3, M4, M5
Melilotus officinalis	sweet clover	2	M1, M3, M4, M5
Mentha pulegium	pennyroyal	1,3	M3, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Mentha spicata	spearmint	2	M1, M3, M4, M5
Mentha x *piperita* ssp. *piperita*	peppermint	2	M1, M3, M4, M5
Moenchia erecta	munchkin chickweed	3	M1, M3, M4, M5
Myosotis discolor	yellow & blue forget me not	3	M1, M3, M4, M5
Myriophyllum aquaticum	parrot feather	3	M1, M3, M4, M5
Oxalis corniculata	creeping wood sorrel	2,3	M1, M3, M4, M5
Parentucellia viscosa	yellow glandweed	3	M1, M3, M4, M5
Pawlownia tomentosa	empress tree	1	M1, M4, M5
Perennial grasses	various ssp.	1	M1, M3, M4, M5
Persicaria maculosa	spotted lady's thumb	1	M1, M3, M4, M5
Phalaris aquatica	Harding grass	1	M1, M3, M4, M5
Phalaris arundinacea	reed canary grass	1,2	M1, M3, M4, M5
Phleum pratense	timothy	1	M1, M3, M4, M5
Plantago lanceolata	English plantain	2	M1, M3, M4, M5
Plantago major	common plantain	2	M1, M3, M4, M5
Poa annua	annual bluegrass	2	M1, M3, M4, M5
Poa compressa	Canada bluegrass	1	M1, M3, M4, M5
Poa pratensis	Kentucky bluegrass	1	M1, M3, M4, M5
Polygonum aviculare	doorweed	2	M1, M3, M4, M5
Polypogon monspeliensis	rabbit foot grass	2	M1, M3, M4, M5
Populus alba	white poplar	1	M1, M4, M5
Portulaca oleracea	common purslane	3	M1, M3, M4, M5
Potentilla recta	sulphur cinquefoil	1	M1, M3, M4, M5
Prunella vulgaris var. *vulgaris*	non-native selfheal	2	M1, M3, M4, M5
Prunus avium	sweet cherry	1	M1, M2, M4, M5
Prunus sp.	plum	2	M1, M3, M4, M5
Pyrus communis	pear	2	M1, M3, M4, M5
Pyrus malus	apple	3	M1, M3, M4, M5
Ranunculus arvensis	field buttercup	3	M1, M3, M4, M5
Ranunculus ficaria	lesser celandine	1	M1, M3, M4, M5
Ranunculus repens	creeping buttercup	1	M1, M3, M4, M5
Robinia pseudoacacia	black locust	1	M1, M4, M5
Rosa eglanteria	sweetbrier rose	3	M1, M2, M4, M5
Rosa multiflora	many flowered rose	1	M1, M2, M4, M5
Rubus armeniacus	Armenian blackberry	1,3	M1, M2, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Rubus laciniatus	evergreen blackberry	1	M1, M2, M4, M5
Rubus vestitus	European blackberry	1,3	M1, M2, M4, M5
Rumex acetosella	sheep sorrel	1	M1, M3, M4, M5
Rumex cetosella	red sorrel	3	M1, M3, M4, M5
Rumex conglomeratus	clustered dock	1	M1, M3, M4, M5
Rumex crispus	curly dock	1	M1, M3, M4, M5
Sanquisorba minor	salad burnet	2	M1, M3, M4, M5
Schedonorus arundinaceus	tall fescue	1	M1, M3, M4, M5
Senecio jacobaea	tansy ragwort	1	M1, M3, M4, M5
Senecio sylvaticus	wood groundsel	1	M1, M3, M4, M5
Senecio vulgaris	old-man-in-the-spring	1	M1, M3, M4, M5
Sherardia arvensis	blue field-madder	2	M1, M3, M4, M5
Sisyrinchium californicum	yellow-eyed grass	3	M1, M3, M4, M5
Solanum dulcamara	bitter nightshade	1	M1, M3, M4, M5
Solanum nigrum	black nightshade	1	M1, M3, M4, M5
Sonchus arvensis	perennial sow thistle	3	M1, M3, M4, M5
Sonchus asper	prickly sow-thistle	1	M1, M3, M4, M5
Sorghum halapense	Johnson grass	1	M1, M3, M4, M5
Spergula arvensis	stickwort	2	M1, M3, M4, M5
Spergula arvensis	corn spurry	1	M1, M3, M4, M5
Spergularia rubra	red sandspurry	2	M1, M3, M4, M5
Stellaria longipes	long stalk starwart	2	M1, M3, M4, M5
Stellaria media	chickweed	2, 3	M1, M3, M4, M5
Taraxacum officinale	dandelion	1, 2	M1, M3, M4, M5
Torilis arvensis	hedge parsley	2	M1, M3, M4, M5
Toxicodendron diversilobum	poison oak	1	M1, M4, M5
Trifolium dubium	least hop clover	1	M1, M3, M4, M5
Trifolium hybridum	alsike clover	2	M1, M3, M4, M5
Trifolium pratense	red clover	2	M1, M3, M4, M5
Trifolium repens	white clover	2	M1, M3, M4, M5
Trifolium spp.	clover	2	M1, M3, M4, M5
Trifolium subterraneum	subterraneum clover	2	M1, M3, M4, M5
Triphysaria versicolor ssp. *versicolor*	yellow owl clover	3	M1, M3, M4, M5
Triticum aestivum	wheat	3	M1, M2, M4, M5
Ulmus glabra	wych elm	1	M1, M4, M5
Verbascum blattaria	moth mullein	2	M1, M3, M4, M5

Scientific Name	Common Name	Weed Classification	Best Management Practices
Verbascum thapsus	wooly mullein	2	M1, M3, M4, M5
Veronica arvensis	common speedwell	2	M1, M3, M4, M5
Vicia cracca	bird vetch	3	M1, M3
Vicia hirsuta	hairy vetch	3	M1, M3
Vicia sativa	common vetch	3	M1, M3
Vicia tetrasperma	slender vetch	3	M1, M3
Vulpia bromoides	barren fescue	1	M1, M3, M4, M5
Vulpia myuros	rat-tail fescue	1	M1, M3, M4, M5
Vulpia sp. (annual)	annual fescue	1	M1, M3, M4, M5
Nuisance woody vegetation	Nuisance trees and shrubs	n/a	M4, M5

11. Appendix H: Insect and Fungus Classifications and BMPs for Floral Gardens

Pest species on this list are subject to change in response to new information from the Oregon Department of Agriculture and the observations of City field staff. These lists provide examples of the types of pests that the City is actively managing and is not intended to be an exhaustive or exclusive list.

Pest	Type	Classification	Best Management Practices
Rose Aphid *Macrosiphum rosae*	Insect	1	Spray off heavily infested plants with a heavy stream of water. Maintain natural enemies. Foliar application of insecticidal soap. Foliar application of Neem oil. **Note: Chemical application for this pest has not been needed to maintain levels below set thresholds.**
Rose Midge *Dasineura rhodophaga*	Insect	1	Conserve natural enemies. Cut off and destroy infected tips. Foliar application of appropriate insecticide. **Note: Chemical application for this pest has not been needed to maintain levels below set thresholds.**
Spider Mites *Tetranychus spp.*	Insect	1	Conserve natural enemies, esp. Minute Pirate Bugs. Reduce dust build-up on leaf tissue. Overhead irrigate to wash leaves. Application of insecticidal soap. Application of horticultural oil or Neem oil. **Note: Chemical application for this pest has not been needed to maintain levels below set thresholds.**
Rose Thrips *Frankliniella spp.*	Insect	1	Conserve natural enemies. Deadhead and dispose of blooms frequently. Tolerate minor damage because nymphs are predators of spider mites. **Note: Chemical application for this pest has not been needed to maintain levels below set thresholds.**
Black Spot *Diplocarpon rosae*	Fungus	1	Remove non-resistant rose varieties. Make sure foliage is dry by midday during the growing season. Provide good air circulation between plants and within the plants themselves. Prune and dispose of any infected leaves. Maintain adequate fertility for rose plants. Increase potash is Black Spot is persistent on an annual basis. Foliar application of fungicidal products every two weeks during the growing season. Alternate or tank-mix products with different modes of action to prevent buildup of resistant fungal populations.

Pest	Type	Classification	Best Management Practices
Powdery Mildew *Sphaerotheca pannosa var. rosae*	Fungus	1	Remove non-resistant rose varieties. Overhead sprinkle or wash leaves at midday (only if Black spot is not present). Prune and dispose of infected leaves and canes. **Maintain adequate fertility for rose plants. Provide good air circulation in** and around plants. Foliar application of fungicidal products every two weeks during the growing season. Alternate or tank-mix products with different modes of action to prevent buildup of resistant fungal populations.
Anthracnose *Sphaceloma rosarum*	Fungus	1	Plant new plants in full sun; try to achieve full sun in existing plantings by pruning/thinning adjacent trees. Keep foliage dry—avoid overhead watering. Minimize water splash from plant to plant.
Crown Gall *Rhisobium radiobachter*	Bacterium	1	Plant only disease-free roses. Check very carefully before you buy plants for any kind of galls in the crown or branches. Use good sanitation practices in handling roses. Plant in clean soil. Avoid areas with a history of crown gall infestation. Avoid fields with heavy infestations of root-attacking insects and nematodes. Select well-drained soil and irrigate from clean water sources. Keep grafts and buds well above the soil line. Destroy diseased plants as soon as you notice them to avoid cross-contaminating other plants or pruning equipment. Also, do not keep infected plants with healthy plants, as the likelihood of accidental transmission through pruning is high. Avoid mechanical injury to plants from tillage and hoeing. Provide winter protection so that the bark does not crack. Disinfect pruning tools between plants. disinfect budding/grafting tools before and after use. Bleach (10%; equivalent to 0.6% sodium hypochlorite), or quaternary ammonium-based sanitizer are effective as disinfectants. Make sure to prepare fresh stock routinely. Use bactericides such as Gallex to apply directly to galls or Nogall to apply to roots and tools as a preventative measure.

Pest	Type	Classification	Best Management Practices
Rust *Phragmidium disciflorum*	Fungus	2	Avoid overhead watering. Prune back severely infected canes. Isolate infected plants. Maintain adequate fertility for rose plants. Provide good air circulation in and around plants. Foliar application of fungicidal products every two weeks during the growing season. Alternate or tank-mix products with different modes of action to prevent buildup of resistant fungal populations.
Azalea Lacebug *Stephanitis pyrioides*	Insect	2	Avoid plant stress by providing sufficient irrigation, and shade requirements. Prune heavily infested plants if appropriate December – March and remove debris from site. Soap spray underside of leaves June-October every 5 weeks.

12. Appendix I: Pest Classifications and BMPs for Community Gardens

Pest species on this list are subject to change in response to new information from the Oregon Department of Agriculture and the observations of City field staff. These lists provide examples of the types of pests that the City is actively managing and is not intended to be an exhaustive or exclusive list.

Pest	Type	Class	Identification	Best Management Practices
Garden (Land) Snail or Slug *Helix species*	Insect	1	Presence of gastropod with spiral shell (slugs lack the shell) mucus (slime) trails, large holes chewed in vegetation. Snails and slugs are most easily seen in cool, moist (not hot or dry) conditions in evening and early morning hours. Hiding places are typically under boards or hard substrate, or between vegetation and these surfaces, or under dead or decomposing vegetation.	1. Initiate active gardening practices such as: cultivate the soil and remove weeds, debris, and decaying organic matter that provide breeding and/or hiding places. 2. Remove shaded hiding locations. 3. Remove slugs by hand. 4. Use beer traps and copper strips around plants. 5. Sprinkle powdered diatomaceous earth around the base of plants.
Early or Late Blight on Tomatoes, Potatoes, and Eggplants *Phytophthora species*	Disease	1	The first symptom on tomato plants is often a brown/black lesion on the stem or petiole. Leaves develop large brown/black blotches, often starting at leaf margins. In humid weather and in early mornings, a fuzzy mold can often be seen on the underside of the brown/black blotches or on the stem lesions. This fuzzy growth contains spores of the fungus. On fruit, infection causes a brown/black, leathery rot. It may become soft and mushy if invaded by secondary organisms On potatoes dark brown markings generally on edges of leaves may occur followed by leaf curling and plant wilting.	Cultural controls alone won't prevent disease during seasons with wet, cool weather. However, the following actions will work toward the cultivation of a successful crop: 1. Plant only healthy-appearing tomato transplants. Check to make sure plants are free of dark lesions on leaves or stems. If starting transplants from seed, air-dry freshly harvested seed at least 3 days. 2. Destroy volunteer tomatoes and potatoes routinely. 3. Salvage fruit and remove infected vines from the site or bury completely. 4. Avoid wetting foliage when irrigating, especially in late afternoon and evening. 5. Space, stake or trellis, and prune tomato plants to provide good air circulation. 6. Rotate out solanaceous hosts for three years. 7. Interplant tomatoes with other crops to decrease spread of the microbe.

Pest	Type	Class	Identification	Best Management Practices
				8. Apply foliar applications of compost tea. 9. Do not save potatoes for future planting if blight has occurred. 10. Delay planting potatoes until early to mid-June to avoid early blight.
Tomato Viruses	Disease	2	The symptoms in tomato vary greatly in intensity depending upon the variety, virus strain, time of infection, light intensity, and temperature. High temperatures, for example, may mask foliar symptoms. The most characteristic symptom of the disease on leaves is a light- and dark-green mosaic pattern Some strains may cause a striking yellow mosaic, whereas others may cause leaf malformation and "fern leafing."	1. Plant virus resistant varieties. 2. Remove infected leaves and or plant material from garden. Do not compost. 3. Take care when handling diseased leaves or plants as some virus can be spread by hand contact. 4. Remove all tomato plants from garden in fall cleanup.
Striped or Spotted Cucumber Beetle *Acalymma species or Diabrotica species*	Insect	1	An adult Striped Cucumber Beetle is oblong, yellowish-green in color, about 1/4-inch-long, and marked by three slate-black stripes. Spotted Cucumber Beetles are greenish-yellow, about 1/3-inch-long with 12 black wing spots. The head and antennae are dark colored. As soon as the cucumber, squash, pumpkin, melons and related seedlings push up through the soil, beetles can eat off the stems and cotyledons, frequently killing them. Adults later feed on the leaves, vines and fruits of plants that survive. Adults also feed on beans, peas, corn and blossoms of other plants.	1. Delayed planting avoids the first generation of cucumber beetles by keeping crops beetle-free until about mid-May. 2. Floating row covers physically exclude cucumber beetles and enhance early plant development. By the time covers are removed and bloom begins these larger plants can withstand moderate pest attacks. If any beetles were present during planting or if area could not be immediately covered the area under cloth should be inspected a few days later to insure no beetles are present. 3. Remove and crush adult beetles by hand. 4. Mulching can deter cucumber beetles from laying eggs in the ground near plant stems and help suppress weeds. 5. Cultivation and residue removal can help reduce overwintering populations of cucumber beetles. 6. Maintain natural enemies: soldier beetles, tachinid flies, braconid wasps and certain nematodes.

Pest	Type	Class	Identification	Best Management Practices
Cabbage Worm/Looper Moth	Insect	2	Velvety green cabbage worms are about 1-1/2 inches long with a fine, light yellow stripe down the back. Adults are the common white moths with black markings often seen in gardens. Adult Looper Moths are brownish with distinctive silvery figures on the front wings. Eggs are ridged and dome-shaped and usually laid singly on the undersurface of leaves. Looper larvae are smooth-skinned with only a few long bristles down the back. Up to 1 ½ inches long, they are green, usually with a narrow white stripe along each side and several narrow lines down the back. Look for ragged-edged holes in the leaf and on the leaf margins	1. Floating row covers keep adult moths from laying eggs. 2. Handpick caterpillars. 3. Maintain natural enemies: Parasitic Wasps, Green Lacewings and Soldier Bugs.
Flea Beetle *Chrysomelidae family*	Insect	2	This tiny, blue-black beetle eats holes in the leaves of many garden vegetables. The larvae also bore tiny tunnels just under the skin of potato tubers.	1. Floating row covers can protect plants from flea beetles until plants grow and begin to mature. Mature plants often can sustain a lot of flea beetle damage without suffering reduced yields, so control at this stage may be unnecessary. 2. Raise plant starts in another location and plant healthy, larger plants with more than three true leaves.
Garlic Rust *Puccinia allii*	Fungus	1	This fungus may occur on onions, leeks, and garlic. Highest infection rates occur at cool temperatures (50-59° F) and 100% relative humidity. Initial symptoms include small white to yellow flecks and spots. The spots enlarge and become oval to elongate or diamond shaped and take on an orange cast. Later in the season, black oval to elongate telia develop. These telia may or may not break through the epidermis. Heavily infected plants have an orange cast, outer leaves may yellow and wither prematurely, and bulb size may be reduced.	1. Remove infected plants from the garden because same-season reinfection is possible. Do not compost. 2. Rotate out of Allium crops for 2-3 years and destroy all volunteers. 3. Use clean seed. 4. Plants stressed by too much or too little water and too much nitrogen are more susceptible to damage from this rust.

Pest	Type	Class	Identification	Best Management Practices
Aphids	Insect	2	Presence of small fleshy insects that do not usually fly. Curled leaves, yellow spots, and sticky wet leaves from “honeydew” or sap.	1. Squish aphids to attract predators. 2. Use a high-pressure stream of water to dislodge aphids. 3. Apply a foliar application of soapy water to affected plants. 4. Maintain natural enemies: Lady Bugs, Green Lacewings, Pirate Bugs, Syrphid Flies, Parasitic Wasps, and Damsel Bugs.

13. Appendix J: Insect and Fungus Classifications and BMPs for Laurelwood Golf Course

Pest species on this list are subject to change in response to new pest occurrences or information from the Oregon Department of Agriculture and the observations of City staff. These lists provide examples of the types of pests that the City is actively managing and is not intended to be an exhaustive or exclusive list.

Pest	Type	Classification	Best Management Practices
Cutworm *Agrotis ipsilon* *Peridroma saucia*	Insect	1	Conserve natural enemies. Manage cutworms by dethatching the turfgrass and ensuring that irrigation does not cause wet areas in the turf. Threshold levels are five larvae per square yard. Conduct a drench test to determine the infestation level. When monitoring indicates a need to treat, treatment choices include parasitic nematodes and *Bacillus thuringiensis* (Bt). If a chemical application becomes necessary, the least toxic product available will be employed.
Yellow Jackets Hornets	Insect "Stinging"	1	Make sure garbage receptacles have lids that Keep food covered and indoors. Eliminate sugary open drink containers Remove ripe fruit that drops from trees. Use yellow jacket traps. Find nearby yellow jacket nests. Treat the nest directly with an appropriate residual insecticide and then remove the nest afterwards.

Pest	Type	Classification	Best Management Practices
Cranefly *Tipula sp.*	Insect	1	A vigorously growing, well-maintained turf grass can easily recover from the feeding of crane fly larvae, even when the populations are fairly high. Well-maintained turf grass has been observed to withstand populations of crane fly larvae that averaged 40 per square foot, whereas unthrifty turf grass may exhibit damage with as few as 15 larvae per square foot. Monitor for crane fly larvae if the turf grass is exhibiting areas of poor growth. Adequate nitrogen fertilizer is essential. Remove excess thatch; it provides an ideal habitat for crane fly larvae, which feed mostly just below the thatch. Aerify the soil to stimulate root development and improve the movement of water and nutrients into the soil. Reseed bare areas of turf grass so that weeds do not invade. Drenches with the nematode *Steinernema feltiae* may give up to 50% reduction if properly applied.
Sod webworm *Chrysoteucia topiaria* *Pedasia trisecta*	Insect	1	Conserve natural enemies. Heavily infested turf (more than 100/sq. yd.) quickly appears moth eaten, with irregular patches of brown grass or bare areas. Significant damage can occur on drought-affected bluegrass and on bentgrass green and tee areas. When sod webworms are present, dethatching the turf grass may help. Monitor to determine if treatment is needed. Treatment choices include parasitic nematodes and *Bacillus thuringiensis* (Bt). Consider treating only when a drench test indicates there are more than 5 larvae per square yard on stressed greens or 15 larvae per square yard in other situations. If a chemical application becomes necessary, the least toxic product available will be employed.
Brown and Yellow Patch *Rhizoctonia spp.*	Fungus	1	Cultural practices that improve water and fertility management are useful in preventing the development of rhizoctonia blight. Reduce shading and improve soil aeration and water drainage. Irrigate in the pre-dawn or early morning hours to promote leaf drying. Irrigate only when needed to a depth of 4 to 6 inches. Remove dew from leaves by poling or light irrigation. Avoid nitrogen fertilization that results in a soft foliage growth. Maintain thatch at less than 0.5 inch. For areas where large patch and yellow patch are chronic, fall fungicide applications may be necessary; otherwise, make fungicide applications soon after the first symptoms of disease are seen. Make fungicide applications soon after signs of the disease are visible.
Fusarium Blight *Fusarium spp.*	Fungus	1	Follow recommended irrigation scheduling practices based on evapotranspiration need of the turf grass to avoid moisture stress. Because the disease is also worse under excessive nitrogen, recommended fertilization practices should also be implemented. Use 20% perennial ryegrass when seeding bluegrass and choose resistant varieties. Low cutting heights on golf courses

Pest	Type	Classification	Best Management Practices
			may worsen infestation, as well as excessive thatch. The crown and basal rot associated with fusarium blight is difficult to control with fungicides. If using fungicides with little or no systemic activity (iprodione), apply them preventively when environmental conditions favor the development of the disease. Systemic fungicides can be used either at this same time, or soon after symptoms begin to appear.
Pink Snow Mold *Fusarium spp.*	Fungus	2	Providing good soil aeration and water drainage and reducing shade can discourage the incidence of Microdochium patch. Monitor the evapotranspiration needs of turf grass to schedule irrigations. Avoid excess nitrogen fertilization, especially in fall and maintain the soil pH between 6.5 and 6.7. High levels of potassium tend to suppress the disease. If Microdochium patch has been a problem in previous years, apply a fungicide in fall before symptoms develop.
Red Thread *Laetisaria fuciformis*	Fungus	2	Providing proper irrigation and fertilization can reduce the incidence of red thread. Adequate nitrogen can usually prevent this disease from occurring. Prevent drought stress by irrigating turf grass based on evapotranspiration needs of the turf grass. Provide adequate air circulation and reduce shading. Fungicides are rarely warranted except in severe cases.
Pythium Blight *Pythium spp.*	Fungus	1	Avoid overwatering; irrigate only when needed to a depth of 4 to 6 inches. Avoid mowing wet grass or applying high levels of nitrogen during hot, humid weather. Reduce shading and improve soil aeration and water drainage. Time establishment of new turf from seed or over seeding for periods when environmental conditions are not favorable for the development of this disease. Due to the speed at which this disease can destroy grass, use fungicides preventively when environmental conditions favor Pythium development, or soon after symptoms are first evident. Apply a fungicide during over seeding or establishment if temperatures are high and the established area is being heavily irrigated.
Dollar Spot *Sclerotina homeocarpa*	Fungus	1	Apply recommended amounts of nitrogen and maintain adequate air circulation. Keep thatch to a minimum. Irrigate based on evapotranspiration needs of the turf grass to a depth of 4 to 6 inches but avoid creating drought stress by extending the interval between irrigations too long. Raise the mowing heights as much as possible. Apply fungicides when environmental conditions favor the development of the disease, or when the first symptoms are detected. Apply until environmental conditions are no longer favorable for the disease.

Pest	Type	Classification	Best Management Practices
Rust *Puccina spp.*	Fungus	1	To reduce the incidence of rust, maintain turf grass vigor by applying adequate but not excessive nitrogen fertilization and irrigate in the morning according to the evapotranspiration needs of the turf grass. Provide good air movement on surface of grass. Mow the turf grass regularly and remove clippings if the lawn is infected to reduce the number of spores. Rust can usually be managed successfully through cultural practices, but in severe cases fungicide applications can be made.
Anthracnose *Colletotrichum gramicola*	Fungus	1	Apply adequately balanced nutrients as necessary, concentrating on potassium and phosphorus. On golf course greens, fertilize with low rates of nitrogen (0.1 - 0.2 lb. /1000 sq. ft.) monthly, especially during late spring and through the summer. Avoid fertilizing during periods of high temperatures (over 80°F). Fungicides are most effective when used preventively. For areas where anthracnose is common, begin applications when the soil temperature rises above 65°F (mid to late spring) to reduce the severity of initial epidemics.

14. Appendix K: Pest Classifications and BMPs for the Native Plant Nursery

Pest species on this list are subject to change in response to new information from the Oregon Department of Agriculture and the observations of City staff. These lists provide examples of the types of pests that the City is actively managing and is not intended to be an exhaustive or exclusive list.

Pest	Type	Class	Identification	Best Management Practices
False brome *Brachypodium sylvaticum*	Weed	1		Hand pull, mow, or string trim to prevent flowering (2-3X), foliar spray (1.5% glyphosate) late spring early summer before it has set seed.
Field Bindweed *Convolvulus arvensis*	Weed	2	Deep-rooted perennial in the morning-glory family	Nursery Grounds: effective control strategies use a combination of approaches including preventing seed production, cultural methods such as the use of weed barriers, and constant vigilance in hand removing top growth. If manual and cultural methods are ineffective, carefully wipe glyphosate on leaves of small or sparse plants. Use careful foliar spot spray of glyphosate only when plants are dense and hand wiping would be too time consuming and ineffective. Native Plant Material: Hand remove seedlings when native plants are small and bindweed easily visible. Otherwise place 2’ tall wooden stakes near plants and coil vines around the stakes as they grow. Carefully wipe glyphosate on plant leaves when most flowers on vine are in bloom but have not yet started to produce seed. Re-treat as necessary to control re-sprouting.

Pest	Type	Class	Identification	Best Management Practices
Perennial rhizomatous grasses *Agrostis sp., Phalaris sp., etc*	Weed	2		When young/sparse, dig out and remove as many root fragments as possible. For areas where grass is well established and cannot easily be removed without damaging native plant material, use a foliar spray during growing season and prior to seed formation; foliar spray shall be 1.5% glyphosate, 0.33 to 0.66% Select or 1.5% Poast, plus 1% Agridex surfactant.
Invasive geranium species *Geranium lucidum*, *Geranium robertianum*	Weed	2		Hand pull. Burn with propane torch during winter and spring, as appropriate. If hand pulling or burning is unsuccessful, then foliar spray (1.5% glyphosate) prior to seed formation.
Lesser celandine *Ranunculus ficaria*	Weed	2		Dig individual plants to get tubers and don't shake soil from roots. Carefully wipe leaves with 100% glyphosate prior to seed formation.
Canada thistle *Cirsium arvense*	Weed	2		Remove young plants before they become established. Remove and dispose of seed heads to prevent spread by seed. Foliar spray established plants.
Non-rhizomatous annual or perennial grasses	Weed	3		Repeated mowing, string trimming, propane burning or hand pulling to prevent plants from going to seed. Use weed fabric and mulch where feasible to prevent weeds.
Other broadleaf weeds, including but not limited to: bittercress,	Weed	3		Repeated mowing, string trimming, propane burning or hand pulling to prevent plants from going to seed. Use weed

Pest	Type	Class	Identification	Best Management Practices
chickweed, nipplewort, creeping wood sorrel, willowherb, plantain, false dandelion, common dandelion,				fabric and mulch where feasible to prevent weeds.
English ivy *Hedera helix*	Weed	3		Manual removal any time of year on Nursery Grounds and between October 15th and January 15 in understory grow out beds. It is anticipated that English ivy on Nursery grounds can be controlled using manual control methods.
Armenian blackberry, Evergreen blackberry and European blackberry *Rubus armeniacus, Rubus laciniatus, Rubus vestitus*	Weed	3		Cut, string trim, or mow 1 to 3 times annually to control flowering; hand dig roots taking care to minimize soil disturbance. It is anticipated that any blackberry at the Nursery can be controlled using manual control methods.
Aphids	Insect	2	Presence of small fleshy insects that do not usually fly. Curled leaves, yellow spots, sticky wet leaves from "honeydew" or sap.	1. Squish aphids to attract predators. 2. Apply a foliar application of a commercial soap solution such as Safer. 3. Encourage natural enemies: Lady Bugs, Green Lacewings, Pirate Bugs, Syrphid Flies, Parasitic Wasps, Damsel Bugs. 4. Apply a certified organic (OMRI) insecticide to affected plants

Pest	Type	Class	Identification	Best Management Practices
Aggressive stinging insects such as wasps, yellow jackets	Insect			See Appendix L
Snail and slugs *Helix spp.*	Mollusk	2	Presence of gastropod with spiral shell (slugs lack the shell) mucus (slime) trails, large holes chewed in vegetation. Snails and slugs are most easily seen in cool, moist (not hot or dry) conditions in evening and early morning hours. Hiding places are typically under boards or hard substrate, or between vegetation and these surfaces, or under dead or decomposing vegetation.	1. Remove shaded hiding places, when feasible. 2. Remove snails and slugs by hand. 3. Sprinkle iron phosphate around the base of plants or around potted plant material. Reapply as needed.
Liverwort	Non-vascular plant	2		Decrease the amount of water applied, increase air flow, and avoid top dressing with fertilizers. Use coarse media (wood chips or sand) that drains well at the top of pots and other growing containers. Carefully hand remove when possible. Apply slow-release iron sulfate or copper sulfate on surfaces or use hydrogen peroxide derived products such as Zerotol or Oxi-date. Apply

Pest	Type	Class	Identification	Best Management Practices
				Physan 20 to containers and use as a cleaning agent to decontaminate shade house following infestation.
Gelatinous algae	Non-vascular plant	2		Decrease the amount of water applied, increase air flow, and avoid top dressing with fertilizers. Use coarse media (wood chips or sand) that drains well at the top of pots and other growing containers. Carefully hand remove when possible. Apply Physan 20 to containers and use as a cleaning agent to decontaminate shade house following infestation.
Moss	Non-vascular plant	2		Decrease the amount of water applied, increase air flow, and avoid top dressing with fertilizers. Use coarse media (wood chips or sand) that drains well at the top of pots and other growing containers. Carefully hand remove when possible.
Pearlwort	Moss-like weed	2		Decrease the amount of water applied, increase air flow, and avoid top dressing with fertilizers. Use coarse media (wood chips or sand) that drains well at the top of pots and other growing containers. Carefully hand remove when possible.

Pest	Type	Class	Identification	Best Management Practices
Damping-off *Pythium spp.* *Rhizoctonia spp*. *Fusarium spp.* *Phytophthora spp.*	Fungus	1	Seedlings rot at or below the soil line and are killed	Prevent damping off by providing good drainage, careful irrigation, proper depth and spacing of planting. Amend soil as needed to improve seedling vigor. Apply organic fungicidal products, such as Actinovate, every two weeks during the growing season. Alternate products with different modes of action to prevent buildup of resistant fungal populations.
Root rot *Phytophthora spp*.	Fungus	1	Stunted plants with yellow and possibly wilted foliage. Roots damaged at or below soil line, resulting in a dark brown rot.	Prevent root rot by providing good drainage and careful water management. Also, care not to plant seedlings too deep, allowing soil to cover the base of the stem. Remove and discard diseased plants. Apply organic fungicidal products, such as Actinovate, every two weeks during the growing season or until control is achieved. Alternate products with different modes of action to prevent buildup of resistant fungal populations.
Stem rot, Crown rot, Blights *Botrytis spp.* *Fusarium spp.*	Fungus	1		Prevent fungal infestation by providing good drainage and careful water management. Remove and discard diseased plants. Apply organic fungicidal products, such as Actinovate, every two weeks during the growing season or until control is achieved. Alternate products with different modes of action to prevent buildup of resistant fungal populations.

Pest	Type	Class	Identification	Best Management Practices
Rust *Puccinia spp.,* etc.	Fungus	2	Yellow, orange, brown, or black spots on leaves or stems.	Avoid overhead watering and isolate/remove infected plants, if possible. Provide good air circulation in and around plants. Foliar application of neem oil or other organic fungicidal products, such as Actinovate, every two weeks during the growing season or until control is achieved. Alternate products with different modes of action to prevent buildup of resistant fungal populations.
Powdery mildew *Erysiphe spp., Leveillula spp., Sphaerotheca spp.*	Fungus	2	Presence of a white, powdery growth on the surfaces of leaves. Infected leaves may be distorted or misshapen and may turn yellow, then brown and die.	Avoid overhead watering and isolate/remove infected plants, if possible. Provide good air circulation in and around plants. Foliar application of neem oil or other organic fungicidal products, such as Actinovate, every two weeks during the growing season or until control is achieved. Alternate products with different modes of action to prevent buildup of resistant fungal populations.
Moles, gophers, voles, and squirrels	Small mammals	--		Use physical barriers such as seedling fabric, shade cloth, bird/deer netting, hardware cloth, repellents, or sonic emitters to exclude or discourage small mammals. If damage to plant material, infrastructure, or nursery grounds is sufficient to warrant further control, use mechanical traps appropriate for the species. Any traps used shall be placed such a way as to limit public exposure and reduce potential to harm non-target species.

Pest	Type	Class	Identification	Best Management Practices
Raccoons, opossum, skunk, and nutria	Small mammals	--		Install fencing or other physical barriers to keep rodents out of areas. Fencing needs to be buried and gates should be low to the ground to discourage tunneling. Reduce hiding or nesting places such as crawl spaces under buildings low growing shrubs, piles of pots or other supplies. If trapping is necessary, use live traps to reduce the impact to non-target species.

15. Appendix L: Aggressive Stinging Insects

Pest	Type	Identification	Best Management Practices
Yellow Jackets, Hornets, and Wasps; *Vespa sp.*, *Vespula sp.*, *Dolichvespula sp.*, *Polistes sp.*	Insects		• Manual removal by professional contractor or trained staff with proper PPE. The potential risks to the public and staff, cost of removal, and availability of a qualified contactor must be evaluated prior to choosing a manual removal contractor • Use approved synthetic pyrethroid in jet steam aerosol formulation • Nests should be sprayed at night or before dawn, when all members of the hive are present and most docile. Daytime spraying is not recommended except in certain emergency cases where the public is not placed at risk from resultant increased hive activity. • Nests should not be disturbed before treatment. Disturbed nests should not be approached. • Nest location should be demarcated as described above. Demarcation must be left up until the nest has been eradicated. • Nests that are situated high in trees, or in otherwise difficult to access locations should be treated by professional contractors, or by qualified staff in the Urban Forestry unit. Do not attempt to control a nest if you cannot easily do so. • Nests in structures, building voids etc., should be treated by professional contractors only.
European honeybee; *Apis mellifera*	Insects		• Demarcate nest or swarm. If the public can be reasonable be protected from the hazard, provide public exclusion and informational signage. • If the nest or swarm must be removed for public safety reasons, seek a qualified manual nest removal contractor.

16. Appendix M: Expectations and Qualifications of IPM Practitioners

IPM practitioners with the Parks and Open Space (POS) Division will be trained in the IPM Policy and IPM Operations Manual described in this document and will implement work consistent with the policy and operations manual.

All pesticide applicators employed by the Parks and Open Space Division must have an Oregon Public Pesticide Applicators License before they are allowed to apply any type of pesticide. All applicators will get the concurrence of their lead worker before making any pesticide application.

Unless special arrangements and approvals have been made, all POS applicators must be regular status employees. Regardless of licensing status, no temporary staff members will apply pesticides on parkland without the required approvals.

The only allowable exception for someone other than a licensed pesticide applicator to apply a pesticide is in response to the presence of venomous stinging insects, and only if it presents a risk to the public or City staff. In these circumstances, the application of an approved "general use" targeted insecticide to eliminate the immediate safety hazard may be required. As defined by the Oregon Department of Agriculture (ODA), "general-use" pesticides are those which do not bear a "Restricted-Use Pesticide" statement on the front panel of the label. Other than this exception, all other applicable POS Management practices, policies, and guidelines including the use of approved pesticides and record keeping and reporting requirements, must be followed.

All pesticide and fertilizer applications made, either by regular staff, seasonal staff, or a contractor and including the use of any pesticide product or fertilizer, must be entered into the Parks and Open Space Chemtrak application database within the following timelines:

- Applications made by staff must be entered into Chemtrak within 3 business days.
- Applications made by a contractor must be submitted to staff within one week and entered into Chemtrak within 10 business days.

Records must include all applicable fields in the Chemtrak form. Applications made by a contractor must mark the check-box in the form marked "contractor".

17. Appendix N: Approved Pesticide List

Following are lists of pesticides that are approved for use in specific work units in parks. A good IPM approach allows for the choice of ideal materials for specific needs. IPM also anticipates the need to managing pest resistance with rotations of products with differing modes of action rather than relying on a "one material fits all" approach. Despite the lengthy appearance of these approved lists, most of these pesticides are not used in a typical year or are used in a very minor way.

It is also important to understand that pesticide applications are used after many other IPM strategies have first been either employed or considered. The vast majority of City of Eugene POS pest management practices never involve the use of pesticides. Similarly, the vast majority of park acreage never receives any kind of pesticide application. Other IPM strategies POS employs include prevention of pests through policy, design and selection, and management of pests through cultural practices, physical means, and mechanical methods.

All pesticides available for use within parks must first be placed upon the approved list after undergoing a review process by the POS supervisor group. This review process carefully examines the individual characteristics of the product and whether it would be an appropriate addition within our program. Issues of efficacy, public health and safety, potential environmental impacts, Salmon Safe compliance, overall plant health requirements, land management needs, and other concerns are taken into account during this process.

All applicators in each work unit are limited to the pesticides appearing on their specific approved list unless an identical equivalent formulation exists with a different brand name Pesticides not appearing on the list are not available for use. Updates/ additions to the Approved Pesticide List are typically made annually. Mid-year additions to the Approved Pesticide List may be made for the following reasons:

1. A new pesticide formulation or new pesticide is discovered which reduces toxicity to the environment, to the public, or to the applicator.
2. A new pesticide formulation or new pesticide is discovered which is more effective than the currently approved formulation.

Careful attention should be paid to the further limitations of pesticides available for use within riparian buffer zones and aquatic sites as outlined and defined in the Waterways section. Additions to the approved lists must follow the process as described in the "Pesticide Use Guidelines" (Appendix D).

The list of chemicals below includes their applicable use as defined at the time of listing. The label is the law and applicators are expected to always check the label prior to use.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Agridex	Adjuvant	Helena Chemical Company	730 g/L: Paraffin base petroleum oil, 149 g/L Polyol fatty acid esters, and polyethoxylated polyol fatty acid ester emulsifier	Non-ionic surfactant	Not specified	Do not contaminate streams, rivers or waterways with the chemical or used containers.
Agri Star MCPA Amine 4	Herbicide	Albaugh, INC.	MCPA as the dimethylamine salt: 48.89%	Broadleaf weeds	Grass seed production (Ag. Lease)	
Aqua Star	Herbicide	Albaugh, Inch	Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	Post emergent, systemic control of many herbaceous and woody plants. Requires non-ionic surfactant. Labeled for aquatic use.	Not specified	Do not apply to water or to areas where surface water is present except to non-crop sites described. Do not contaminate water when disposing of equipment washwater.
Aquamaster	Herbicide	Monsanto Company	Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	Post emergent, systemic control of many annual and perennial weeds and woody brush and trees. Requires non-ionic surfactant. Labeled for aquatic use.	Aquatic and other non-crop sites	Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Axiom DF	Herbicide	United Phosphorous	Metribuzin	Control of certain grasses and broadleaf weeds in crops	Grass seed production (Ag. Lease)	
Bayleton 50	Fungicide	Bayer	triadimefon	Broad spectrum fungicide	Approved for use on turfgrass and ornamentals and on rose sp. for powdery mildew.	Do not enter treated areas without protective clothing until sprays have dried
Beetleblock MCH	Insecticide	AgBio	3-methylcyclohex-2-en-1-one	A repellant pheromone product for control of the Douglas-fir beetle *Dendroctonus pseudotsugae*	Use in tree stands containing a significant proportion of Douglas-fir or spruce trees.	
Bifenture EC	Insecticide/ Miticide	UPI	Bifenthrin	Wide-spectrum control of insects and mites in a broad range of crops	Grass seed production (Ag. Lease)	
Burnout	Herbicide	Bonide	Citric Acid, Clove Oil	For non-selective control of herbaceous broadleaf and grassy weeds	Use along borders, on driveways, sidewalks, around buildings, along fencelines, etc.	DANGER rating for ocular and dermal exposure.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Callisto	Herbicide	Sygenta	Mesotrione	A postemergence and preemergence herbicide for control of annual broadleaf weeds in field corn, production seed field corn, field corn grown for silage, yellow popcorn, and other listed crops (including grass grown for seed).	Grass seed fields for use only in grass seed agricultural lease areas.	Do not apply directly to water or to areas where surface water is present, or to intertidal areas below the mean highwater mark. This product may contaminate water through drift or spray or wind. This product has a high potential for runoff for several weeks after application. A level, well maintained buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential for contamination of water from runoff.
Casoron G4	Herbicide	OHP, Inc	Dichlobenil (2,6-dichlorobenzonitrile)	Pre-emergent control of annual and perennial weeds.	Non-crop areas: around buildings and structures, around fences, recreational areas, under containerized nursery stock.	Do not apply to water or areas where surface water is present. Do not contaminate water when disposing of equipment washwater. The use of this chemical where soils are permeable may result in groundwater contamination. Do not apply when windy. Do not overwater the treated area. Do not use in enclosed structures. Apply as soil surface treatment from November 15 to February 15. Do not enter or allow persons or pets to enter the treated area until granules are thoroughly watered in and treated soil has dried.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Clearcast	Herbicide	SePRO Corporation	Ammonium salt of imazamox 2-[4,5-dihydro-4-methyl-4-(1-methyethyl)-5-oxo-1*H*-imidazol-2-yl]-5-9methoxymethyl)-3-pyridinecarboxylic acid	Control of submerged, floating and emergent vegetation in and around aquatic and non-cropland sites including estuarine, ponds, lakes, wetlands, ditches, streams, rivers, creeks.	In and around aquatic and non-cropland sites including estuarine, ponds, lakes, wetlands, ditches, streams, rivers, creeks.	See label.
Clearsurf 90	Adjuvant	Chem Nut Inc.	Proprietary blend of alkylpolyoxethylene, glycol derivatives, humectant and formulation aids	A general purpose non-ionic surfactant, used to enhance spreading and coverage of sprays.	Grass seed production (Ag. Lease)	
Clearys 3336F	Fungicide	Cleary	thiophanate-methyl	Broad spectrum fungicide	Approved for turfgrass, landscape and interiorscape, annual and perennial flowers, bedding plants, foliage plants, ground covers, and deciduous and evergreen shrubs.	Keep children and pets out of treated areas until sprays have dried
Trio	Adjuvant	CNI	Proprietary blend of methylated seed oil and organosilicone surfactant	A crop protection adjuvant designed to improve permeation of tank mix partners	Grass seed production (Ag. Lease)	
Competitor	Adjuvant	Wilbur-Ellis	Ethyl Oleate, Sorbitan Alkylpolyethoxylate Ester, Dialkyl	Modified vegetable oil containing a non-ionic emulsifier	Not specified	No data available for ecotoxicology or environmental fate.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
			Polyoxyethylene Glycol	system with aquatic label.		
Dicamba HD	Herbicide	Albaugh	Diglycolamine salt of 3,6-dicloro-o-anisic acid	Herbicide for weed control in asparagus, conservation reserve programs, corn, cotton, fallow croplands, forestry sites, general farmstead (non-cropland) sorgum, grass grown for seed, hay, proso millet, pasture, rangeland, rights-of-way, small grains, soybean, sugarcane, and turf.	Grass seed fields for use only in grass seed agricultural lease areas.	Do not apply directly to water, or to areas where surface water is present or to intertidal areas below mean high water mark. Use of this chemical where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. Do not mix within 50 feet of wells, sink holes, perennial or intermittent streams and rivers, and natural or impounded lakes or reservoirs. Do not apply under conditions which favor runoff.
Eagle 20EW	Fungicide	Dow AgroSciences	Myclobutanil	Broad-spectrum fungicide	Approved for residential and non-residential turf and landscapes including roses	Keep unprotected persons out of treatments areas until sprays have dried.
Element 3A	Herbicide	Dow AgroSciences	triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt	Control of woody plants and broadleaf weeds. Labeled for aquatic use in production forests and industrial non-	Forests and non-crop areas: rights of way, roadsides, fencerows, non-irrigation ditch banks, wildlife openings.	Do not contaminate water when cleaning equipment or disposing of equipment wastewater. Treatment of aquatic weeds can result in oxygen depletion. The use of this chemical in areas where soils are

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
				crop sites. Requires non-ionic surfactant.		permeable may result in groundwater contamination.
Envoy Plus	Herbicide	Valent	Clethodim	selective postemergence herbicide for control of annual and perennial grass weeds	Fallow land, non-bearing food crops, non-crop or non-planted areas (rights of way, roads, dividers, medians, storage yards, fence lines, parkways, beneath greenhouse benches and around golf courses) and ornamentals.	Do not apply to water or to areas where surface water is present. Do not apply where runoff is likely to occur. Do not contaminate water when disposing of equipment washwater or rinsate. Do not apply if rain is expected within one hour of application. Do not apply a broadleaf herbicide within one day.
Express	Herbicide	DuPont	Tribenuron methyl	For use on cereals, ExpressSun Sunflowers, Grass grown for seed, Fallow and as a pre-plant or post-harvest burndown herbicide	Grass seed fields for use only in grass seed agricultural lease areas.	Injury or loss of desirable trees or vegetation may result. Do not apply one or near desirable trees or other plants or on areas where their roots may extend. Do not use on lawns, walks, driveways, tennis courts, or similar areas. Do not discharge excess material into a single area in the field. Other restrictions, See label.
Fusilade -DX	Herbicide	Syngenta	Fluazifop	Selective postemergence herbicide for control of annual and perennial grass weeds	Fallow land, listed noncrop areas, and on listed nonbearing crops (see product label for full lists). Has been evaluated and found to be the best grass selective herbicide for areas with Fender's blue butterflies.	Toxic to fish and aquatic invertebrates. Do not use in areas where runoff to waterbodies is expected. Apply to actively growing grasses. Do not apply to grasses that are under stress from lack of moisture, temperature, low soil fertility, mechanical, or chemical

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
						injury.
Gallex	Bactericide	AgBioChem	2,4 xylenol; meta-cresol	A ready-to-use flowable emulsion for control of crown gall, burr and olive knot bacterial diseases on certain fruit and nut trees, vines, ornamentals. Apply to non-edible organs only.	Not listed	Gallex will injure tender foliage, stems and root tissues of most plants. Do not apply directly to water or to areas where surface water is present, or to intertidal areas below the mean high-water mark. Do not contaminate water when disposing of equipment, washwater or rinsate.
Garlon 3A	Herbicide	Dow AgroSciences	triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt	Control of woody plants and broadleaf weeds. Labeled for aquatic use in production forests and industrial non-crop sites. Requires non-ionic surfactant.	Forests and non-crop areas: rights of way, roadsides, fencerows, non-irrigation ditch banks, wildlife openings.	Do not contaminate water when cleaning equipment. Treatment of aquatic weeds can result in oxygen completion. Use of this chemical in areas where soils are permeable may result in groundwater contamination.
Garlon 4 Ultra	Herbicide	Dow AgroSciences	triclopyr: 3, 5,6-trichloro-2-pyridinyloxyacetic acid, butoxyester	For the control of woody plants and herbaceous broadleaf weeds.	Non-crop areas: storage sites, rights of way, roadsides, fence rows, non-irrigation ditch banks, forests, wildlife openings.	Toxic to fish. Do not apply directly to water or to areas where surface water is present. Use of this chemical in areas where soils are permeable may result in groundwater contamination.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
GlyStar Plus	Herbicide	Albaugh, Inc	Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	Non-selective (broad spectrum) post-emergent systemic herbicide for control of annual and perennial weeds, woody brush and trees.	Non-crop areas: ditch banks, dry ditches, fencerows, golf courses, landscape areas, municipal sites, natural areas, ornamentals, parks, parking areas, plant nurseries, public areas, recreational areas, rights of way, roadsides, sports complexes, storage areas, turfgrass areas, utility sites, warehouse areas, wildlife management areas.	Do not apply directly to water or to areas where surface water is present. Do not contaminate water when cleaning equipment.
Goal 2XL	Herbicide	Corteva Agriscience	Oxyflourfen	Pre- and post-emergent control of broadleaf weeds and grasses	Grass seed production (Ag. Lease)	
Habitat	Herbicide	BASF Corporation	Isopropylamine salt of Imazapyr (2-[4,5-dihydro-4methyl-4-(1-methylethyl)-5-obo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)	Control of undesirable emergent and floating vegetation in and around standing and slowing water.	In and around standing or flowing water, including estuarine and marine sites. Applications may be made to control undesirable wetland, riparian and terrestrial vegetation growing in or around surface water when applications may result in inadvertent applications to surface water.	See label.
Hi-Light Blue Dye	Adjuvant	Becker Underwood	Trade secret	temporary colorant for marking spray applications	Not specified	No data available for ecotoxicology or environmental fate, however the material is not expected to have any deleterious effect.
Kinetic	Adjuvant	Helena Chemical Company	Proprietary blend of polyalkyleneoxide modified polydimethylsiloxane and nonionic surfactants	Nonionic wetter/spreader/penetrant/adjuvant for postemergent nonselective sprays.	Use with products registered for agricultural, aquatic, forestry, industrial, non-cropland, ornamental, rights of way, turf, municipal and other uses with pesticides/fertilizers and micronutrients.	No data available on the label for ecotoxicology or environmental fate.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
				Approved for aquatic use.		
Krenite S	Herbicide	DuPont	Ammonium salt of fosamine, [ethyl hydrogen (aminocarbonyl) phosphonate]	Foliar brush control. Requires non-ionic surfactant.	Non-crop sites including rights of way and storage areas. Between planting beds, intermittent drainage, intermittently flooded low lying sites, seasonally dry floodplains and transitional areas between upland and lowland sites when no water is present. Marshes, swamps and bogs after water has receded.	Do not apply directly to water or to areas where surface water is present. Do not contaminate water when cleaning equipment.
Liquid Blue Spray Indicator	Adjuvant	Helena Chemical Company	Unknown	temporary colorant for marking spray applications	Not specified	No data available for ecotoxicology or environmental fate.
Lock Out	Molluscicide	Wilbur-Ellis Company	Metaldehyde	Controlled Release Pellet to control slugs and snails in grass grown for seed	Grass seed fields; for use only in grass seed agricultural lease areas.	• This product is solely for use on agricultural crops grown for commercial or research purposes, and is State and/or Federal invasive mollusk eradication efforts. • This product may not be applied to residential sites)i.e.in yards, gardens, around homes and apartments and other sites such as exterior areas around schools and daycare facilities,

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
						and athletic fields, playgrounds, parks, recreation areas, etc. • When broadcast applications are allowed, apply using standard broadcast spreaders, • For Grass seed, grass grown for forage and hay, taro, and wheat. Apply by broadcast application.
Metricor DF	Herbicide	United Phosphorus Inc.	Metribuzin	For control of bentgrass in grasses grown for seed.	Grass seed fields; for use only in grass seed agricultural lease areas.	No not apply directly to water or to areas where surface waters are present.
Milestone	Herbicide	Dow AgroSciences	Aminopyralid: 2-pyridine carboxylic acid, 4-amino-3,6-dichloro-2-pyridinecarboxylic acid	For control of annual and perennial broadleaf weeds including invasive and noxious weeds, certain annual grasses, and certain woody plants and vines. Requires non-ionic surfactant.	Non-crop areas: fencerows, non-irrigation ditch banks, parking lots, roadsides, storage areas, dry storm water retention areas, unimproved rough turf grasses. Natural areas: parks, prairie management, trailheads, trails, recreation areas, wildlife habitat and management areas.	Do not contaminate water when cleaning equipment. Treatment of aquatic weeds can result in oxygen depletion. Use of this chemical in areas where soils are permeable may result in groundwater contamination. Treated grasses, hay, seed, manure, and straw may not be used off site for 18 months.
Moss Melt Concentrate	Herbicide	Green Spear, Inc.	d-limonene (citrus oil)	Moss and algae killer	Lawns, Turf, around border plants and structures.	Do not apply directly to water or run off to areas where surface water is present. Do not contaminate water when cleaning equipment.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Herbicide						
M-Pede	Insecticide	Dow AgroSciences	Potassium salts of fatty acids (insecticidal soap)	Control of soft-bodied insects, mites, and powdery mildew	Shade and ornamental trees, turf, and flowering plants growing outdoors	Product may be hazardous to aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high-water mark.
NEEM Concentrate	Fungicide	Green Light Company	clarified hydrophobic extract of neem oil	Kills eggs, larvae, and adult insects. Prevents and controls blackspot on roses, anthracnose, rust, and powdery mildew. Kills insects and their eggs.	Formulated for interiorscape use.	Environmental Hazards: Do not apply directly to water. Do not contaminate water when disposing of equipment washwaters or rinsate. Bee Hazard: This product is toxic to bees exposed to direct treatment. Do not apply this product while bees are actively visiting the treatment area. Physical and Chemical Hazards: Do not use or store near heat or open flame.
NEEM Concentrate	Insecticide	Green Light Company	clarified hydrophobic extract of neem oil	Kills eggs, larvae, and adult insects. Prevents and controls blackspot on roses, anthracnose, rust, and powdery mildew. Kills insects and their eggs.	Formulated for interiorscape use.	Environmental Hazards: Do not apply directly to water. Do not contaminate water when disposing of equipment washwaters or rinsate. Bee Hazard: This product is toxic to bees exposed to direct treatment. Do not apply this product while bees are actively visiting the treatment area. Physical and Chemical Hazards: Do not use or store near heat or open flame.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Nogall	Bactericide	Bio-Care Technology	Agrobacterium radiobacter	For biological control of Crown Gall	Owen Rose Garden	Do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the high-water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters.
No-Pest Strip2	Insecticide	Spectrum Group	Dichlorovos	For control of insects in unoccupied strucutres	Only approved for use to directly treat native seed in bags or containers as required for Seeds of Success Program	WARNING: May be fatal if swallowed. Do not get in mouth. Harmful if inhaled. Causes moderate eye irritation. Avoid breathing vapors. Avoid contact with eyes or clothing. After prolonged storage, a small amount of liquid may form on strip. Do not get liquid in eyes. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse. Do not use in homes except for garages, attics, crawl spaces, and sheds occupied by people for less than 4 hours per day. Not to be taken internally by humans or animals.
Nortron SCV	Herbicide	Bayer	Ethofumesate: (2-ethoxy-2,3-dihydro-3,3-dimethyl- 5-benzofuranyl methanesulfonate)	For Selective Control of Weeds in Certain Grass Seed Crops and Commercial Sod Production in California, Idaho, Nevada	Grass seed production (Ag. Lease)	This pesticide is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high-water mark. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Nu Film P	Adjuvant	Miller Chemical & Fertilizer Corporation	Pinene (polyterpenes) Polymers, a-(p-Dodecylphenyl)-Omega-hydroxypoly (oxyethylene)	Non-ionic spreader-sticker designed to improve the contact, wetting, and adhesion of pesticides.	Upland sites with Fenders blue butterflies	Not for aquatic use. Do not apply directly to water or to areas where surface water is present. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.
Palisade EC	Growth Regulator	Sygenta Corporation	Trinexapac-ethyl	For growth management of grasses grown for seed, wheat, triticale, barley, oats, and rye	Grass seed fields; for use only in grass seed agricultural lease areas.	For terrestrial uses: Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high-water mark.
Pic Ant Killing Systems	Insecticide	Pic Corporation	Sodium tetraborate decahydrate (borax), Ortho Boric Acid	Control of ant nests/ ant activity	For indoor use and in and around structures	Large volumes may be phytotoxic and toxic to aquatic life. No data available on the label for ecotoxicology or environmental fate.
Poast	Herbicide	BASF Corporation	Sethoxydim: 2-[(ethoxyimino)-butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one	Selective postemergence herbicide for control of annual and perennial grass weeds. Requires non-ionic surfactant.	Non-crop areas: rights of way, roadsides, along fences, along hedgerows, public buildings, recreation areas, storage yards, uncultivated agricultural areas and general indoor or outdoor sites.	Toxic to aquatic organisms. For terrestrial uses. Do not apply directly to water or to areas where surface water is present. Do no contaminate water when disposing of equipment washwaters or rinsate.
Preference	Adjuvant	AgriSolutions	Alkylphenol ethoxylate, sodium salts of fatty acids, isopropyl alcohol	non-ionic surfactant	Not specified	No data available for ecotoxicology or environmental fate.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
Prozap Zinc Phosphide Pellets	Rodenticide	Hacco, Inc.	Zinc Phosphide	For Year-Round Below-Ground Control of Voles and Mice in Grasses Grown for Seed	Grass seed production (Ag. Lease)	Users are advised that the Migratory Bird Treaty Act makes it unlawful to kill any migratory bird except as permitted by regulation. **Any bird deaths caused by application of this pesticide are a violation of both state and federal law.** In North America, all birds are considered migratory except for upland game birds (e.g. grouse, ptarmigans, prairie chickens, quail, ring-necked pheasant and wild turkey) and introduced bird species (e.g. European starling, house sparrow, and rock dove). Refer to label booklet for Endangered Species Considerations.
Quilt Xcel	Fungicide	Sygenta	Propiconazole, Azoxystrobin	Provides preventive and curative disease control, plant stress management and yield-boosting benefits that bring a positive return on investment on corn, soybean and cereal crops	Grass seed production (Ag. Lease)	
Rodeo	Herbicide	Dow AgroSciences	Glyphosate, N-(phosphonomethyl)glycine, in the form of	Non-crop areas, forests, parks, natural areas, ditches, canals.	Non-crop areas, forests, parks, natural areas, ditches, canals.	Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds

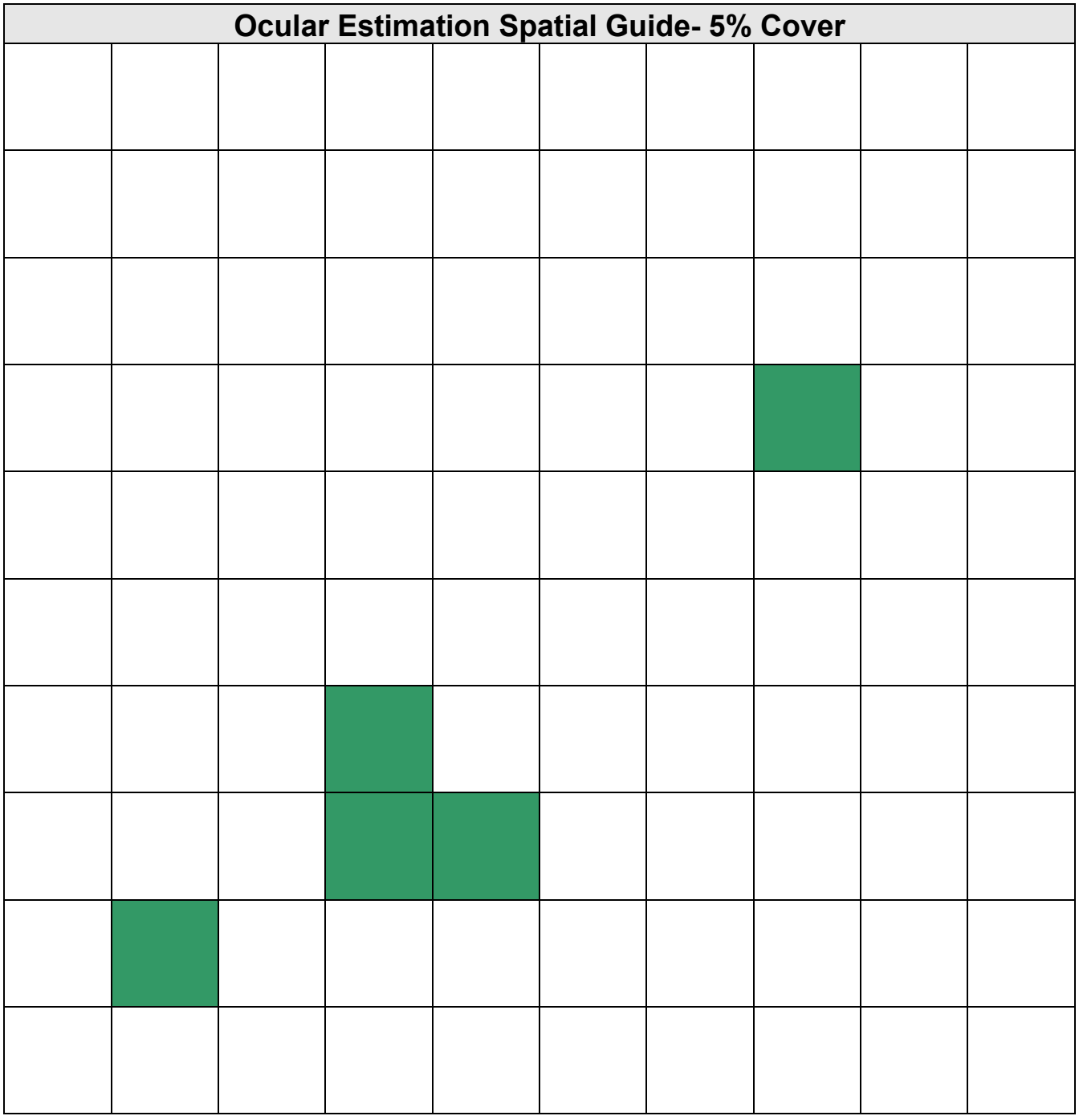
Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
			its isopropylamine salt			can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.
Roundup Custom	Herbicide	Monsanto Company	Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	Complete broad-spectrum post-emergence herbicide.	Aquatic, crop, non-agricultural crop, industrial, turf, ornamental, forestry, roadside, and utility rights-of-way.	Do not contaminate water when cleaning equipment or disposing of equipment wastewater. Treatment of aquatic weeds can result in oxygen depletion
Scythe	Herbicide	Gowan Company	Pelargonic acid	Burndown of a broad spectrum of weeds on contact	Non-crop areas: Turfgrass, flowers, bedding and landscape plants, trees and shrubs, greenhouses, fallow land, storage areas, schools, paved areas, rights of way, parking lots, recreation areas, athletic fields, golf courses, walks, structures, buildings, walkways, dry aquatic sites, drainage systems and around aquatic sites.	Do not apply directly to water or areas where surface water is present. Do not contaminate water when disposing of equipment washwaters or rinsate.
Select Max	Herbicide	Valent	Clethodim ((E)-2-[1-[[(3-chloro-2-propenyl)oxy]imino]propyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-2cyclohenen-1-one)	Selective postemergence herbicide for control of annual and perennial grass weeds. Requires non-ionic surfactant.	Fallow land, native prairie	Do not apply directly to water or to areas where surface water is present. Do not contaminate water when disposing of equipment washwater or rinsate.
Sluggo	Molluscicide	Certis USA LLC	Iron phosphate	Control of slugs and snails	For outdoor, terrestrial use	For terrestrial use. Do not apply directly to water, or to areas wher5e surface water is present or to intertidal areas below the mean high-water mark. No data available

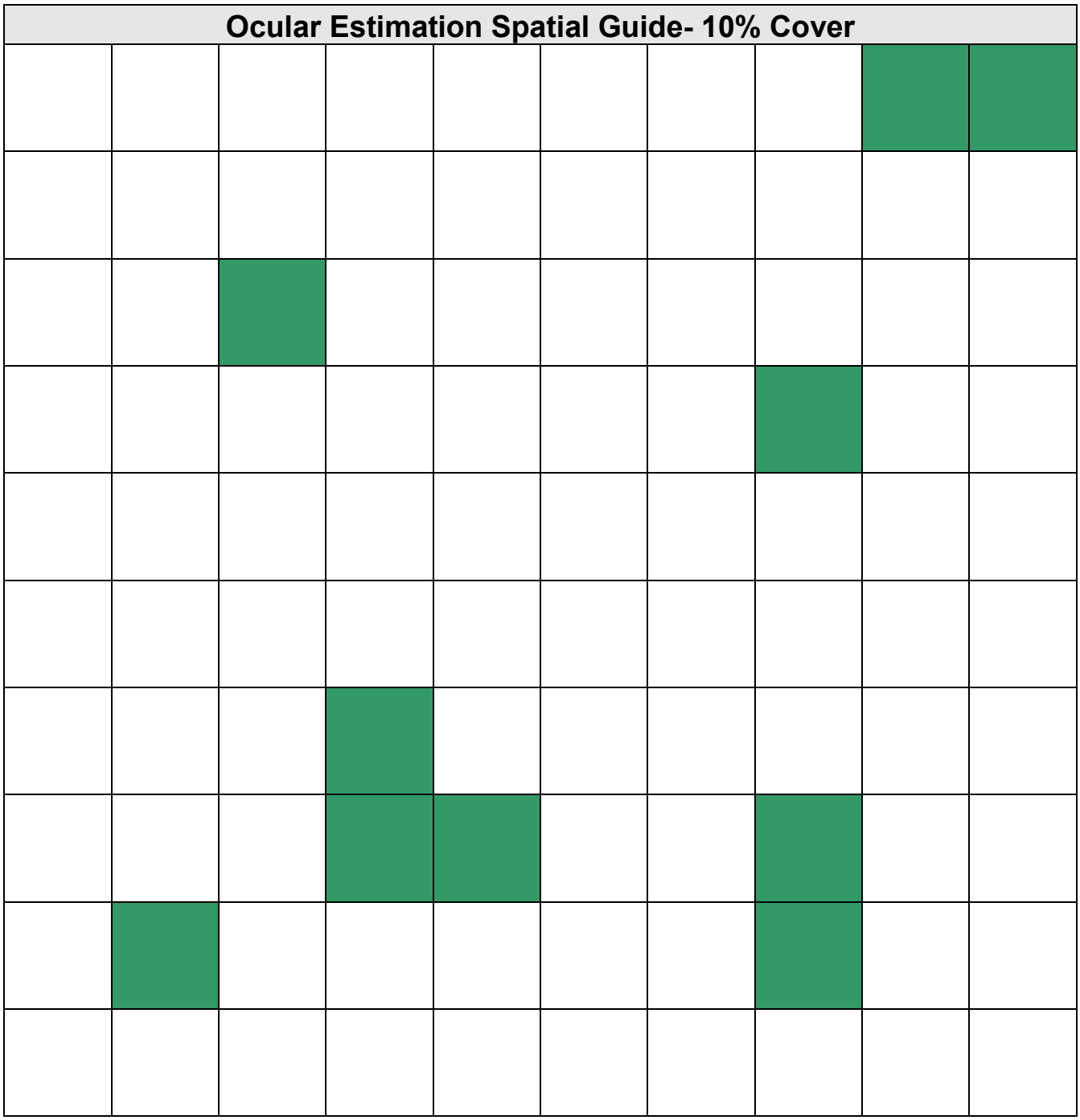
Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
						on the label for ecotoxicology or environmental fate.
SpectracidePRO Wasp & Hornet Killer	Insecticide	Spectrum Group	Prallethrin, Lambda Cyhalothrin	Control of wasps, hornets, and yellow jackets	For outdoor use	No data available on the label for ecotoxicology or environmental fate.
Spotlight	Herbicide	Dow AgroSciences	fluroxypyr	Selective broadleaf weed control in turf.	For control of annual and perennial broadleaf weeds in established turf.	Do not allow people (other than applicator) or pets on treatment area during application. Do not enter into treated areas until sprays have dried.
SPRAYON Blast'em Wasp & Hornet Killer	Insecticide	Sprayon	Tetramethrin, Permethrin, Piperonyl Butoxide, Technical	Control of wasps, hornets, and yellow jackets	For outdoor use	No data available on the label for ecotoxicology or environmental fate.
Subdue Maxx	Fungicide	Sygenta	mefenoxam	Broad-spectrum fungicide	Approved for use on ornamentals and turf	Do not enter or allow others to enter until sprays have dried.
Systhane	Fungicide	Dow AgroSciences	myclobutanil	Broad-spectrum systemic fungicide	Approved for use on ornamentals	Keep unprotected persons out of treated area until sprays have dried.
Terro Ant Bait Stations	Insecticide	Senoret Chemical Co	Sodium tetraborate decahydrate (borax)	Control of ant nests/ ant activity	For indoor use and in and around structures	Large volumes may be phytotoxic and toxic to aquatic life. No data available on the label for ecotoxicology or environmental fate.

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites		Use Restriction(s) and Environmental Hazards >SEE LABEL<	
Transline			Herbicide	CORTEVA agriscience	clopyralid: 3,6-dichloro-2-pyridinecarboxylic acid, monoethanolamine salt	Control of broadleaf annual and perennial weeds and woody brush species	Natural areas (open space) for example, campgrounds, parks, prairie management, trails and trailheads, recreation areas, wildlife openings and wildlife habitat and management areas;	Do not contaminate water when cleaning equipment. Use of this chemical in areas where soils are permeable may result in groundwater contamination. Treated grasses, hay, seed, manure, and straw may not be used off site for 18 months.
Triclopyr 3A	Herbicide	Albaugh, LLC	triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, triethylamine salt	Control of woody plants and broadleaf weeds. Requires non-ionic surfactant. Labeled for aquatic use in production forests and industrial non-crop sites.	In forests and industrial non-crop areas: rights of way, roadsides, fence rows, non-irrigation ditch banks, wildlife openings and in and around standing water sites as described.		Do not contaminate water when cleaning equipment. Treatment of aquatic weeds can result in oxygen completion. Use of this chemical in areas where soils are permeable may result in groundwater contamination.	
Vantage	Herbicide	Top Pro Specialties	Sethoxydim: [-2-[1-[[(3-chloro-2-propenyl)oxy]imino] propyl]5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one	Selective postemergence herbicide for control of annual and perennial grass weeds in turf, ornamentals,			For Terrestrial use, do not apply directly to water or to areas where surface water is present. Do not contaminate water when disposing of equipment washwaters.	

Product	Type	Manufacturer	Active Constituent(s)	Typical Use(s) and General Information	Applicable Use Sites	Use Restriction(s) and Environmental Hazards >SEE LABEL<
				nonfood, and listed non-crop sites.		
Vastlan	Herbicide	Dow AgroSciences	Triclopyr choline: 2-[(3,5,6-trichloro-2-pyridinyl)oxy] acetic acid, choline salt	Control of woody plant species and annual and perennial broadleaf weeds in the described use sites. Requires non-ionic surfactant. Labeled for aquatic use.	Landscape and Ornamental Areas;Non-crop areas: utility rights of way, fencerows, non-irrigation ditch banks, parking lots, roadsides, storage areas, storm water retention areas, unimproved rough turf grasses, vacant lots and other non-crop residential areas. Natural areas (open space): parks, prairie management, trails and trailheads, recreation areas, wildlife habitat.	Do not contaminate water when cleaning equipment or disposing of equipment wastewater. Treatment of aquatic weeds can result in oxygen depletion. The use of this chemical in areas where soils are permeable may result in groundwater contamination.
Zidua	Herbicide	BASF	pyroxasulfone	Residual preemergent weed control in perennial cools season grasses planted for grass seed.	Grass seed fields for use only in grass seed agricultural lease areas.	Do not apply in course soils. Do not aply more than 1.85 oz/ acre in a single yearly application. Do not apply in combination with any other pyroxasulfone-containing products. Pregrazing and preharvest intervals. Do not apply during periods of cold weather that limit crop growth.

18. Appendix O: Ocular Estimation Charts

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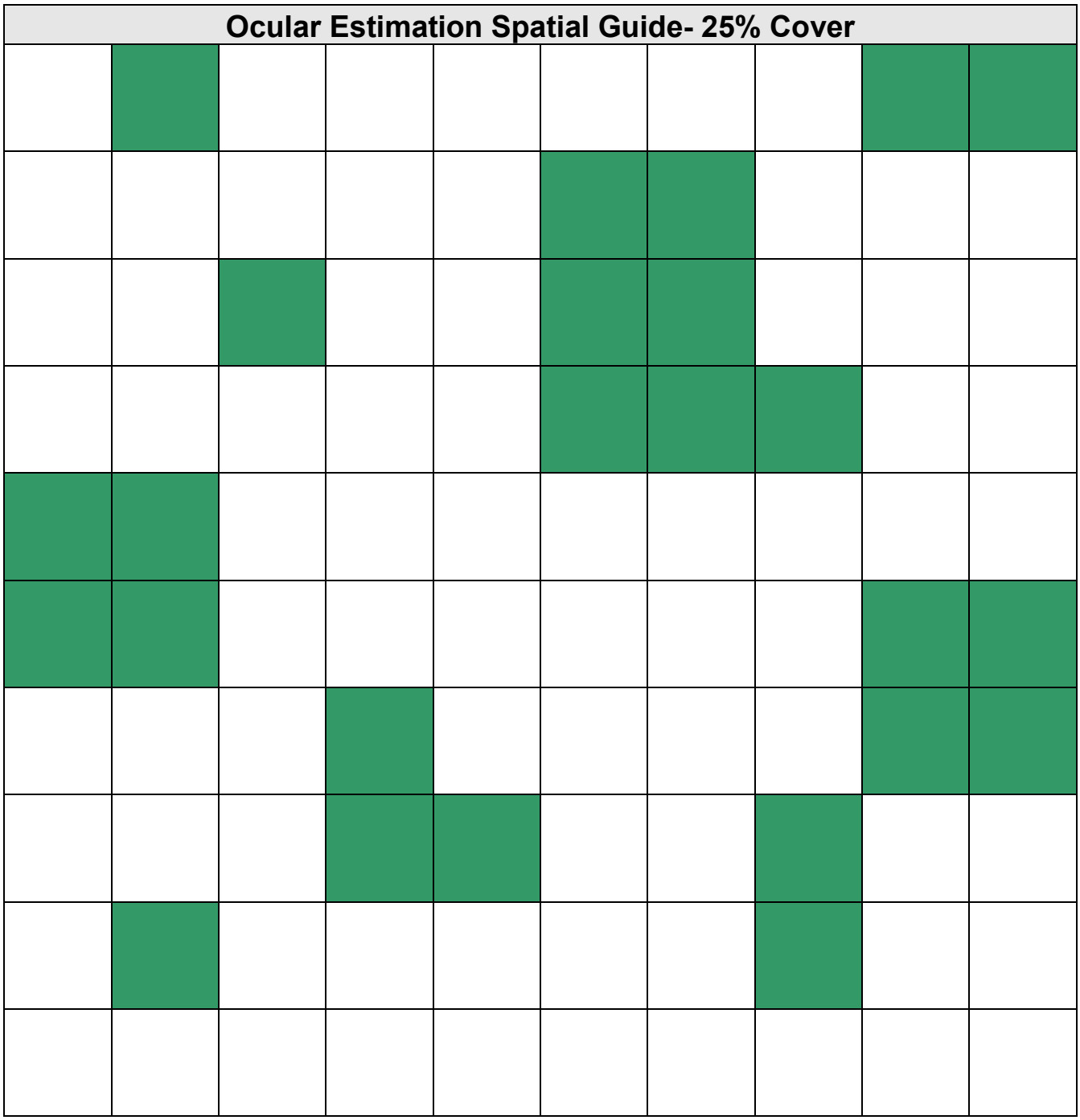
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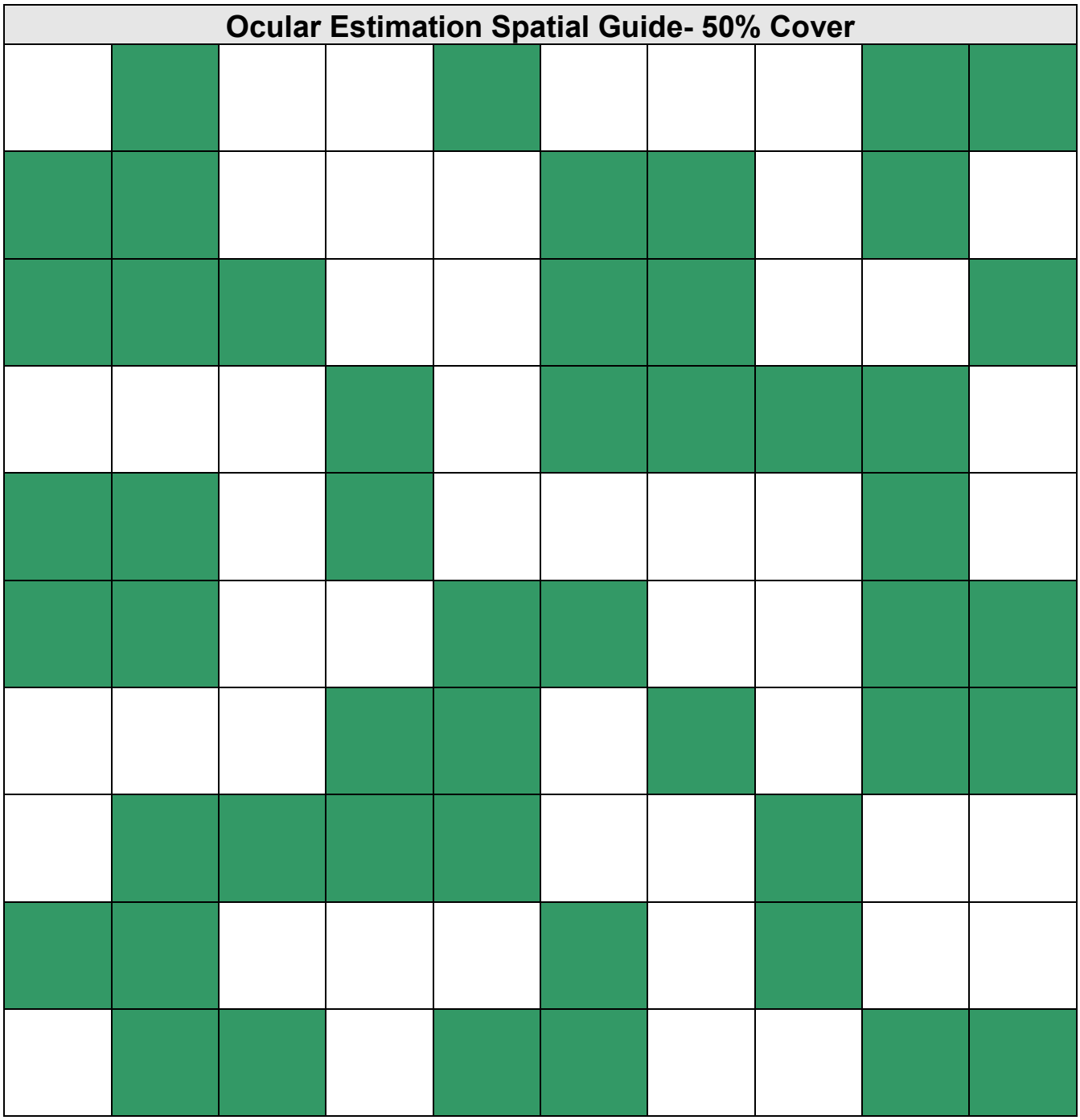
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