

King County Integrated Pesticide Management Status Report

December 2019



King County

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II. Executive Summary

King County's Integrated Pest Management (IPM) program has been active since 1999. King County and its partners have made investments in programs and training for county applicators, private applicators, and the public to reduce pesticide use throughout the county. This has helped reduce most toxic pesticides used by their agencies, facilitated sharing regional best practices with maintenance staff at cities, schools, daycare centers, and hospitals, helped create markets for "green" landscapers and nurseries, and led to engagement with property owners on less toxic yard and garden behaviors. The IPM program also created workshops, websites, campaigns, a safer pesticides app, and business promotions. These efforts included training and information in English, Spanish, and Vietnamese.

The IPM program uses the term pesticides to refer to the group of chemicals known as herbicides, which are used to control noxious and other weeds. The program does not address fungicides, rodenticides, or insecticides (although a few insecticides are evaluated as needed). Using the existing inventory of products that Seattle and King County maintenance staff had in 1999, the Washington Toxics Coalition rated pesticide products using several criteria to create a set of Tier Tables ([original Tri County Tier Table 1-3 versions](#)).

Tier Table 1 are the highest risk, most toxic or hazardous products. Tier Table 2 lists moderately toxic products to be used under limited conditions. Tier Table 3 lists non-chemical products such as biological pesticides. These products may use living organisms such as viruses, bacteria, fungi, and nematodes (types of worms) or the toxins produced by them. This may also include products derived from natural materials such as animals, plants, bacteria, and minerals. The benefit of using biological pesticides is low toxicity to humans and non-target insects. Originally, tier Table 4 would list non-chemical alternatives such as design and maintenance guidelines that reduce weeds, different weeding tools, hand or flame weeding, cover crops, mulching, tilling, etc. Ultimately, a proposed Tier Table 4 to list such techniques was not created; instead, that information was incorporated into an online guide to choosing safer pesticide control: [Grow Smart, Grow Safe](#).

The IPM program continues to reduce or eliminate overall use of the highest risk pesticides on county managed landscapes to address weed management. With the 1999 introduction of IPM, there was an immediate reduction of pesticide use.

More recent usage records from 2014 to 2018 show downward trends in the use of Tier Table 1 liquid forms of pesticide products. In 2018, product usage was approximately 15 percent of the 2014 volumes (79.93 gallons and 513.07 gallons respectively). Comparing the Tier Table 1 liquid product use to Tier Table 1 solid product use shows how applicators alternate and limit using higher amounts of liquid products with lower amounts of solid product. Tier Table 2 liquid and solid product use has remained consistent over that timeframe. See Charts 1 and 2: Total King County Agency Tier Table 1 and 2 Liquid and Solid Product Use 2014-2018 on page 18.

The IPM program has led to practices that are more effective and includes landscape design and judicious use of these chemicals. For example, pesticide applicators avoid relying on a product with a single mode of action that can cause plants to develop a resistance to treatments. The flexibility to combine pesticides with different modes of action and alternate their use with other technologies can prevent resistance and target specific weed issues.

These efforts, and the public information campaigns offered over the last two decades, have fostered a regional norm in reducing pesticide use. A recent comparison of the pesticide practices of Pacific Northwest residents to national respondents shows a distinct significance: 73 percent of Puget Sound residents reported not using chemical products in their gardens as compared to 39 percent of national respondents. Public emails, online comments, and queries opposing glyphosate, i.e. “Round-up”, use also reflect this regional norm and concern about pesticide use.

Public information campaigns address an important regulatory gap for audiences whose use of pesticides and other toxic products has little guidance: property owners and smaller businesses. As less regulated groups, these audiences have little access to government-based pesticides information or programs that are well designed, engaging, accessible in multiple languages, and that offer information such as choosing less toxic products, their safe use, and disposal.

Over the past 20 years, the IPM program has made progress consistent with the [1999 Executive Order](#). The ongoing program includes these practices:

- County agencies adopted the original 1999 IPM policy and guidelines.
- County applicators annually file requests with the IPM Coordinator to use Tier Table 1 and 2 products. These are exception or conditional use requests that include a description of how the product will be used, general areas it will be used (e.g. flower beds or roadways), for what type of weeds, application methods, and other circumstances. The requests are reviewed against use criteria (for example, not to be applied in the rain, near water, etc.) for that product, shared with the applicator, and recorded.
- Product use is tracked on Excel spreadsheets, emails, or hand-written records. Exception and conditional use responses are recorded on separate documents.
- IPM public engagement activities are included in the annual National Pollutant Discharge Elimination System (NPDES) report.
- County applicators adhere to applicable [state and federal rules](#) on pesticide certification and safe use practices.

Overall, IPM practices are being used by operations and maintenance personnel throughout the County. Historical and current data reveal the following:

- In 1999, King County used 8,800 pounds of pesticides in its operations, 88 percent of which were in the “most hazardous” (Tier Table 1) category targeted for phase-out. Overall, the total use of pesticides decreased 50 percent from 1999 to 2000. The use of Tier Table 1 products decreased 62 percent, while use of Tier Table 2 products increased by 34 percent as employees shifted to less-hazardous chemicals.
- From 2014 to 2018, use by county agencies of all Tier Table 1 pesticides products was 1,096.67 gallons and 571.15 pounds.
- From 2014 to 2018, all pesticides used by county agencies of Tier Table 2 products totaled 1,500.68 gallons and 221 pounds.

- Today, the use of the most toxic Tier Table 1 products has been phased out or significantly reduced, and exemption requests to use a product are reviewed annually.
- The trend in Tier Table 2 moderately toxic products shows fairly consistent annual usage (see Chart 2: Total King County Agency Tier Table 1 and 2 Solid Product Use 2014-2018 on page 18).
- Requests for conditional use (to ensure products are used appropriately) are reviewed annually.
- There is an overall reduction in the stored inventory of Tier Table 1 and 2 products.
- There is ongoing regional sharing of best management practices to address weed control issues.

Despite progress made, some IPM actions would benefit from additional resources. There are minimal updates to online information, public workshops or programs, and limited website information on pesticide application or reduction (e.g., the website Pesticide Free Places is no longer in service.) Applicators are not mapping the locations of pesticide applications, nearby public use facilities, date/time/weather, or usage amounts applied in those locations. Additionally, the IPM program and pesticide management has changed considerably since the [1999 Executive Order](#). These changes include:

- Contractors maintaining county facilities have not been included in reporting pesticide use or the IPM processes they are using. The 1999 Executive Order did not specifically include contract language guidance. That issue was considered and recommended in 2001 but was not adopted.
- The King County IPM committee disbanded after 2010. At that time, pesticides engagement programs were ongoing, and applicators were trained in using Tier Tables and IPM practices.
- The [2012 King County Site Management Plan](#) addressed property management practices on county owned sites but did not integrate and replace the 1999 IPM policy and guidelines. Some applicators and managers have been unaware that the Stormwater Services Section of the Water and Land Resources Division (WLRD) of the Department of Natural Resources and Parks (DNRP) issued the updated maintenance and IPM guidelines in 2012 to meet NPDES permit requirements.
- The oversight commitment shifted in 2014 from the lead agency, the [Hazardous Waste Management Program](#), to WLRD's Stormwater Services Section. This change was a reasoned shift that fit the Stormwater Section's responsibility to meet the municipal National Pollutant Discharge Elimination System (NPDES) stormwater permit requirements. Further, the Section does not have a pesticides application role and can fulfill a neutral oversight responsibility.
- Pesticide applicators have additional oversight through their municipal NPDES stormwater permit managers.
- There have been reduced resources for fulfilling the IPM program responsibilities as the program responsibilities shifted from Hazardous Waste Management to the Stormwater Services Section. This was an unanticipated responsibility in 2014 and had not been included in budget or work planning for the Section. The changes in program oversight resulted in a break in communication with the pesticide applicators, less information sharing and access, and irregular reporting.

- Annual usage reports are mainly complete, with some historical records since 2000 difficult to locate due to retirements, staff changes, record-keeping practices, and lead agency transition.
- There has been new research on the impacts of pesticides, their active ingredients, surfactants and inert or proprietary ingredients on human development, habitat health, pollinators, soils, and other factors such as climate change.
- There is renewed participation and information sharing with the Seattle-led IPM committee, and continued participation of county applicators in regional annual refresher trainings.

Subject matter experts and applicators have discussed recommendations to renew King County's commitment to the IPM program and address new challenges. Recommendations meet three broad objectives: (1) strengthened internal efforts, (2) improved external outcomes, and (3) enhanced support to local jurisdictions and communities. These recommendations help advance the Executive's Clean Water, Healthy Habitat water quality goals and integration objectives, meet NPDES permit requirements, and provide opportunities to integrate IPM goals with the County's Equity and Social Justice Strategic Plan (ESJ), Strategic Climate Action Plan, and Best Run Local Government goals.

Recommendations to strengthen King County's IPM program include new work and approaches, and updating, restoring, or expanding existing efforts. These are summarized under Report Requirements H., Table 3 Recommendations. While many improvements may be accomplished through updating the 1999 Executive Order, others have associated funding and staffing considerations.

Proposed internal actions include the following:

- (1) Ensure that King County contract language specifies vendors' chemical use, reporting guidelines, and participation in the County's IPM program. Contractor guidelines proposed in 2001 have yet to be adopted and provide a transparent and accessible means to track and monitor one of the largest users of chemicals.
- (2) Develop an online tool for internal agency mapping and reporting pesticide use by building upon the existing King County Noxious Weeds online application. This would avoid creation of a new, standalone application, streamline record keeping for County applicators, maintain a centralized database, and provide a map of locations to assess and monitor vulnerable residents or areas. This online geospatial tool would provide disparate land managers, applicators, and seasonal staff centralized access to critical information on IPM requirements and help identify ESJ concerns.
- (3) Review, update, and King County's 2012 maintenance and IPM guidelines to align with new NPDES permit requirements and King County's adopted goals related to climate, equity, Best Run Government, and Local Food Initiative. This would improve the awareness, engagement, and use of the updated guidelines by county land managers and pesticide applicators.

Proposed external and community engagement actions include funding a full-time staff position responsible for managing the IPM outreach and social marketing program. The program historically funded multiple FTEs assigned to different aspects of the program (i.e., IPM coordinator, training, public engagement, etc.). The program currently has 0.2 FTE. This new capacity would follow similar recent steps by other major municipalities, including the City of Seattle, to provide a means to re-invest in IPM-related social marketing-based strategies for programs such as Natural Yard Care, Yard Talk, Grow Smart-Grow Safe, and Pesticide Free Places. Again, this renewed programming would allow

opportunities to incorporate climate, ESJ, and Best Run Government objectives. These efforts are currently under consideration as part of King County Stormwater Services strategic plan development and would enhance staff capacity to fully implement those developing goals.

Specific recommendations, along with rationale and issues to consider, are detailed further in Table 3, under requirement H. Recommended Actions.

III. Proviso Text

Ordinance 18835¹, Section 80, Proviso P1

PI PROVIDED THAT:

Of this appropriation, \$200,000 shall not be expended or encumbered until the executive transmits a status report on the county's integrated pest management program, a motion that should acknowledge receipt of the status report and reference the subject matter, the proviso's ordinance, ordinance section and proviso number in both the title and body of the motion and a motion acknowledging receipt of the status report is passed by the council.

In 1999, the executive instituted Executive Order [PUT 8-17 \(AEO\)](#). It required certain county agencies to develop and implement agency-specific integrated pest management programs in accordance with the Tri-County Integrated Pest and Vegetation Management Model Policy and Guidelines. The executive order also required the constitution of a King County integrated pest management steering committee. The executive order directed the phasing out of certain Tier 1 pesticides as identified in tables incorporated by reference into the order but are no longer publicly available. The status report shall include, but not be limited to:

- A. A list of all county agencies that conduct pest and vegetation management activities in the course of their assigned duties and narrative description of their compliance with the executive order;
- B. The status of the King County integrated pest management steering committee;
- C. Description of the county's efforts, including all agencies listed in response to subsection A. of this proviso, to comply with the Appendix A Tri-County Integrated Pest and Vegetation Management Model Policy and Guidelines, including any revisions made to the documents since issuance of the executive order;
- D. Attached as Exhibit A, a copy of the Tables 1-4 attached and incorporated by reference into the executive order, as well as any updates or revisions to those tables;
- E. Description of the progress of each county agency listed in response to subsection A. of this proviso, in reducing or eliminating their use of products listed as Tier 1 of Tables 1-4, as required by the executive order;
- F. A summary of best practices implemented nationally to reduce the use of chemical herbicides and pesticides by total volume or by pesticide tier;
- G. Information on known impacts of pesticide use to honeybees and its impacts to King County's agricultural areas, including information on neonicotinoids and alternatives; and

¹ [2019-2020 Adopted Biennial Budget 18835, Section 80, P1](#)

- H. Recommended actions to strengthen and improve the integrated pest management program, including necessary resources and updates to the integrated pest management guidelines, pesticide tier listings or procedures.

The executive should file the status report and a motion required by this proviso by November 1, 2019, in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff and the lead staff for the planning, rural service and environment, or its successor.

IV. Background

Department Overview: The Water and Land Resources Division (WLRD) has a biennial budget of roughly \$300M that supports the work of nearly 400 staff. WLRD manages stormwater for unincorporated areas, houses three salmon recovery forums, acquires open space, restores habitat, monitors water quality, controls noxious weeds, and provides economic and technical support for forestry and agriculture. As service provider to the Flood Control District, the division reduces flood hazards and restores rivers and floodplains. Additionally, WLRD operates the county’s Environmental Lab and Science sections, which provide environmental monitoring, data analysis, and management and modeling services to partners, jurisdictions, and residents throughout the region. The King County Hazardous Waste Management Program – a collaborative effort with the county and King County municipalities – is also part of WLRD.

Historical Context: Integrated Pest Management (IPM) is defined as the “management of agricultural and horticultural pests that minimizes the use of chemicals and emphasizes natural and low-toxicity methods to identify and reduce the use of toxic pesticides.” This can mean using mechanical or non-toxic practices like mowing or hand weeding, biological strategies using beneficial insects or bacteria, spot spraying for particular issues, or special targeted campaigns using pesticide injection to manage noxious weed infestations in sensitive or ecological areas rather than spraying.

Washington State is a national leader in addressing the economic, safety and health impacts of invasive plants, passing its first [weed law](#) in 1881 and annually reviewing its list of noxious plants. The state requires landowners to manage specific plants based on how widespread the invaders are.

King County’s Noxious Weed Control Program and the county’s Noxious Weed Board work with the [Washington State Noxious Weed Control Board](#) annually to update the list of plants property owners must control. That information is found at [KingCounty.gov/weeds](#). The list guides how county land managers decide their yearly strategies to comply with the Washington State Weed Law. King County’s pesticide applicators must meet those guidelines and balance the impacts of their practices with habitat and human health and safety.

In 1999, County Executives from Snohomish, Pierce and King County identified actions they could take to address endangered Chinook salmon and Bull Trout. One of those actions focused on the impact of pesticide use on those species. Executive Order [PUT 8-17 \(AEO\)](#) required King County Departments, Offices, and Agencies to create an IPM program, led by the former Local Hazardous Waste Management Program (now known as the Hazardous Waste Management Program). This program was to create policy and guidelines to reduce county usage of especially toxic pesticides used for weed management, and to develop criteria to prioritize phasing out the most toxic products. The program uses the term

pesticides to refer to the group of chemicals known as herbicides used to control plants. The program does not address fungicides, rodenticides, or insecticides (although a few insecticides are evaluated as needed).

The City of Seattle worked with Washington Toxics Coalition to conduct a preliminary assessment of the pesticides used by its agencies and prioritized the most toxic to be phased out. King County adopted those tables in order² “to the maximum extent practicable, phase out use of the products listed in Tier 1 of Tables 1-4.” The Tier Table products were those pesticides that county applicators had in stock or commonly used. Based on available information in chemical databases, national and international risk reviews, safety data sheets, and manufacturer materials, products were rated by their risks to salmon. That process created the four original Tier Tables. Tier Tables 1-3 remain in use; with Tier Table 4 recommendations integrated into [Grow Smart, Grow Safe](#) information on tools, practices and design.

The impact of the program was immediate: In 1999³, King County used 8,800 pounds of pesticides in its operations, 88 percent of which were in the “most hazardous” (Tier 1) category targeted for phase-out. Overall, the total use of pesticides decreased 50 percent from 1999 to 2000. The use of Tier 1 products decreased 62 percent, while use of Tier 2 products increased by 34 percent as employees shifted to less-hazardous chemicals. Site managers changed their practices using labor-intensive hand weeding, mulching, and tolerating more weeds, which led to complaints from the public accustomed to manicured sites. In the first year, county departments also used a statewide free pesticide disposal collection service to remove over 2,800 pounds of Diazanone (phased out by 2005), Dursban (Chlorpyrifos), and weed and feed (glyphosate) products from storage.

Since 1999, county pesticide applicators have adopted IPM practices and guidelines, maintained their certification with refresher training, and shared best practices with other land managers at an annual training hosted by the City of Seattle. Thurston County has been a long-time partner on the Tier Tables, and now maintains the tables on the [GrowSmartGrowSafe.org](#) website. Thurston County uses the same toxicity criteria, but with a priority on reducing the use of pesticides that pose a risk to their vulnerable municipal groundwater supplies.

This report focuses on reporting from 2014 to 2018, the time period when the oversight commitment shifted from the [Hazardous Waste Management Program](#) to WLRD’s Stormwater Services Section. Over the life of the program, there have been variations in agency reporting of Tier Table 1 and 2 pesticides annual usage caused by several factors including:

- Inconsistent reporting by departments, transitions in IPM Coordinators, and/or missing records.
- Extra emphasis on certain noxious weeds in some years (e.g., a focus on milfoil, which requires a larger, one-time usage).

² King County Executive Order PUT 8-17 (AEO), November 15, 1999.

³ Integrated Pest Management in King County Government; A Status Report Through the year 2000, King County IPM Steering Committee, July 2001, Appendix F.

- Experimentation in control methods (e.g., one year an applicator may try an alternative control method, such as a Tier Table 2 pesticide, that may not be effective, prompting use of a Tier Table 1 pesticide in the following season).
- Variability in the prevalence of noxious weeds, site conditions that can vary year to year, and the changes in pesticide application accordingly year to year.

In 2019, the City of Seattle increased restrictions on the use of glyphosate products, the active ingredient in Round Up, or weed and feed type products. Consistent with the City’s approach, some county programs and agencies, such as the Noxious Weed Control Program in WLRD and some applications in the Wastewater Treatment Division (WTD) in DNRP, voluntarily reduced use of treated glyphosate as a Tier Table 1 product in their weed management programs.

Efforts are ongoing to reduce glyphosate usage. Some applicators avoid using glyphosate products year to year to avoid creating resistant plants, and use those products when plants reestablish. Seven county agencies: WTD, WLRD, the Parks and Recreation and Solid Waste Divisions in DNRP, the Roads Services Division in the Department of Local Services, the King County International Airport, and Metro Transit used a combined 1,188.76 pounds gallons of glyphosate from 2014-2018. This is the total volume of glyphosate products used to manage an estimated 39,942 acres of lands and facilities and approximately 1,500 miles of roads and 390 miles trails (see Table 1 Summary of County Properties Managed under the IPM Policy). The trends in annual glyphosate usage by agency are shown in Chart 3 Total King County Agency Reported Glyphosate Use in Gallons 2014-2018 on page 20.

When the IPM program began, applicators were encouraged to use glyphosate as the practical, relatively safer chemical alternative. Glyphosate is unique in that it is not mobile in terrestrial applications. Its high affinity to soil means it remains where applied in landscaped areas. A non-selective pesticide, it will control weeds, grass, shrubs and saplings (when applied to a cut stump). Glyphosate may be used in the rain with an EZject lance to target and control invasive trees such as holly, laurel, and butterfly bush. It is used to control vegetation along edges of pavement to prevent pooling of rainwater and the breakdown of road surface from vegetation buildup.

Chart 3 Total King County Reported Agency Reported Glyphosate Use in Gallons 2014-2018 shows that the usage in this period is relatively consistent between 144 gallons in 2017 to 317 gallons in 2015, and reflects the pattern of a low use year followed by a higher use year. This proviso response and the heightened public focus on glyphosate toxicity are an opportunity to review the status of King County pesticide usage and the IPM program.

V. Report Requirements

These sections list the proviso requests for information. Data on pesticide usage is from records maintained by former IPM Coordinators and this report focuses on the reporting period from 2014 to 2018 when the Stormwater Services Section assumed responsibility for IPM program coordination. That data is compiled from the annual usage records submitted by county pesticide applicators for their agencies. A review of Facilities Management Division contractor records shows no herbicides used (some insecticides and fungicides are used to address threats to vegetation health).

A. A list of all county agencies that conduct pest and vegetation management activities in the course of their assigned duties and narrative description of their compliance with the executive order

The IPM effort has focused on reducing impacts to public health and the local environment, specifically in public lands, environmental habitats and exposure to threatened or endangered salmonids. The majority of the most toxic Tier Table 1 products are no longer used by county applicators. The remaining use of pesticides by King County agencies are of moderate to low toxicity pesticides for the control of noxious weeds, with limited amounts of Tier Table 1 products used on an exception basis. Some short-term increases in particular Tier Table 1 product usage are to address specific physical challenges or noxious weed issues such as: 1) weeds in or near water⁴, 2) larger stands of weeds in newly acquired natural lands, 3) newly identified noxious weed outbreaks that threaten public health, the environment, or agriculture, 4) weeds with extensive root systems, and 5) noxious weeds in steep, rocky, or hard to access areas.

Applicators must follow [Washington State Department of Agriculture](#) requirements regarding usage records retention, personal protective equipment use, public notification, recertification, etc.

Table 1 lists the types of properties managed by each agency as described by the King County Assessor’s Office Real Property Section. King County agencies management areas under the IPM program include 39,942 total acres and approximately 1,500 miles of roadways and 390 miles of trails.

Table 1 ⁵Summary of County Properties Managed under the IPM Policy

Agency	Current Use	Acres
King County International Airport	Air Field, Other Developed	590
Facilities Management Division	Building Site, Surface Water Basin	81

⁴ Tier Table levels for pesticides are based on multiple factors including human health, mobility in soil and environmental hazards. Concerns or issues identified in any one area, such as human health, can result in a Tier 1 rating, but that rating does not necessarily indicate a high hazard level in all areas. When the Washington State Department of Ecology evaluates pesticides for use in or near water, it evaluates the potential impacts on fish and other aquatic life. So while many Tier 1 pesticides are not considered safe for use near water based on Tier Table criteria, some Tier 1 pesticides are approved for use in or near water by the Washington State Department of Ecology because they have low toxicity to fish and other aquatic life. In addition, some Tier II pesticides are considered lower risk overall but are toxic to fish so are not approved for use in water by the Washington State Department of Ecology.

⁵ Data from Real Property, email 10-30-2019

Parks and Recreation Division	Building Site, Conservation Futures, Development Rights, Easement, Farmland Development Rights, Flood Control, Forest Land, Gravel Pit, Greenbelt, Open Space, Parks & Trails, Parking Lots, Solid Waste Landfill Site, Surface Water Basin, Wetland	29,998
Real Estate Services	Active Landfill, Building Site, Greenbelt, Maintenance Building, Open Space, Developed and Undeveloped Sites, Solid Waste Landfill Site, Surface Water Basin, Tax Title	2,336
Road Services Division	Building Site, Drainage Easement, Gravel Pit, Greenbelt, Maintenance Yard, Open Space, Developed and Undeveloped Sites, Parking Lot, Road Services, Roadway, Surface Water Basin, Wetland	1,052
Agency	Current Use	Acres
Solid Waste Division	Building Site, Developed and Undeveloped Sites, Roadway, Solid Waste Landfill Site, Transfer Station, Transfer Station	254
Metro Transit	DC Substation, Developed and Undeveloped Sites, Park & Ride, Transit, Transit Base, Transit Center	284
Wastewater Treatment Division	Building Site, Easement, Marine, Shop/Building, Open Space, Developed and Undeveloped Sites, Outfall Station, Parking Lot, Pump Station, Regulator Station, Sewer Tunnel, Interceptor, Storage Facility, Surface Water Basin, Treatment Plant, Water Quality Lab	719
Water & Land Resources Division	Building Site, Conservation Futures, Drainage, Easement, Farmland Development Rights, Flood Control, Forest Land, Gravel Pit, Green River Flood Control District, Greenbelt, Open Space, Developed and Undeveloped Sites, Park Site, Pedestrian Trail/Path, Roadway, Storm Drain, Surface Water Basin	4,627
Total Acres		39,942

Washington State law ([Chapter 16-750 WAC](#) and [Chapter 17.10 RCW](#)) mandates the control of noxious weeds, which necessitates some pesticide applications by King County. [Noxious weeds](#) are non-native plants that, once established, are highly destructive, competitive, and difficult to control. These plants have economic and ecological impacts, and are very difficult to manage once established. Some are toxic or a public health threat to humans and animals; others destroy native and beneficial plant communities. County applicators have to balance the weed treatment with ecological or permit considerations. For example, the Road Services Division (Roads) of the Department of Local Services (DLS) does not perform routine herbicide spraying in ditches, near water, or in the moratorium zones of

Vashon-Maury Island and Snoqualmie Valley. Moratorium zones are areas King County has historically agreed to not spray whenever feasible and use alternative control methods. However, legally mandated noxious weed control can include targeted pesticide application in these areas, including moratorium areas. Pesticide applications may be required to reduce safety hazards for pedestrians, motorists, and bicyclists, for pavement maintenance and longevity, or for public and worker safety.

In complying with the 1999 Executive Order, Tier Table 1 (most toxic or hazardous) pesticides may only be used after the applicator receives a conditional approval letter from the IPM Program Coordinator. King County departments and applicators have been fulfilling these IPM program requirements. To date, facility contractors have not been included in the IPM program and oversight of their practices has been through the Facilities Management Division.

At the start of the year, an applicator submits an exemption form requesting to use a listed product, which is reviewed by the IPM Coordinator for the recommended conditions for the use of that product. Conditional approval may be:

- When a Tier Table 1 product or active ingredient is needed to address an issue to meet a federal or state permit.
- If there are no effective Tier Table 2 or 3 pesticides to control target weeds.
- If the quantity of Tier Table 2 or 3 pesticides necessary to control noxious weed is significantly higher than that for a Tier Table 1 product to achieve the same result (e.g. 30 gallons of a Tier Table 2 or 3 required to control a noxious weed, versus one gallon of a more effective Tier Table 1 product).
- For limited use of a Tier Table 1 pesticide to address plants in physically difficult to treat or reach areas such as rockeries or no mow areas, or as a one-time application to address a noxious weeds infestation.

Table 2 summarizes the Tier Table 1 and 2 products used by county land managers. Examples of how applicators use certain products are described by active ingredient following the table. The active ingredients are used in place of product names in the product tables because reporting product names vary for several reasons:

- In new formulations or marketing, product names may be product X, product X Plus, or Super Max product X and this may include a change in Environmental Protection Agency (EPA) registration number but not always.
- Multiple products can have the same EPA registration number. For example, Element 3, Garlon 3A, and Renovate 3A have the same EPA registration number but are from different manufacturers. They have similar formulations and how they are reported can vary between applicators.
- A product may be acquired or its ownership transferred to another company resulting in a name change, but retain the same EPA registration number.
- Some products have many name variations. Roundup, for example, has approximately 40 name variations, each with a similar EPA registration number. Applicators may report "Roundup

Ready-to-Use” but in reality this may be: Roundup Ready-to-Use 1 – EPA #71995-12; Roundup Ready-to-Use 2 – EPA #71995-13; Roundup Ready-to-Use Extended 1 Plus – EPA #71995-21, etc.

- Some applicators use a generic name for product reporting even if it is not the exact name.
- It is important to record the EPA registration number, but glyphosate products are summarized by total usage in this report.

Table 2 All Pesticides Used by County Agencies (2014-2018)

All Pesticides Used by County Agencies 2014 – 2018				
Pesticide	Tier #	Departments	Total Used	
			Gallons	Pounds
2,4-D, butoxyethyl ester	1	WLRD	0.80	–
2,4-Dichlorophenoxyacetic Acid	1	WLRD	1.15	–
2,4-Dichlorophenoxyacetic Acid / Triclopyr	1	WLRD	4.73	–
2,4-Dichlorophenoxyacetic Acid / BEE / Triclopyr	1	Airport, Solid Waste, WLRD	2.96	–
2,4-D Dimethyl Amine Salt / Mecoprop	1	WLRD	0.27	–
2,4-D, Dimethylamine salt	1	WLRD	3.63	–
Aminocyclopyrachlor / Chlorsulfuron	1	Parks, WLRD	1.71	–
Aminopyralid Triisopropanolamine Salt	1	Parks, Roads, Solid Waste, WLRD	33.94	–
Aminopyralid, Metsulfuron Methyl	1	WLRD	–	0.40
Ammoniated salts of fatty acids	2	WTD	2.50	–
Caprylic Acid / Capric Acid	1	Parks	1.35	–
Clethodim	1	Parks	1.42	–
Dichlobenil	1	Roads	–	25.00
Dimethylamine Salt of 2,4-Dichlorophenoxyacetic Acid	1	WLRD	285.48	–
Ferric HEDTA	2	Parks	3.59	–
Glyphosate - various formulations	2	Airport, Parks, Roads, Solid Waste, Transit, WLRD, WTD	1,188.76	–
Imazamox	2	Parks, WLRD	40.63	–
Isopropylamine salt of Imazapyr	1	Parks, Roads, Solid Waste, WLRD	178.32	–
Isoxaben	2	Airport, WLRD, WTD	1.29	–
Metsulfuron methyl	1	Roads, WLRD	–	44.70
Metsulfuron Methyl / Chlorsulfuron	1	WLRD	–	0.05
Oryzalin	1	Airport, Parks, WTD	9.81	501.00
Pelargonic Acid	2	Parks, WTD	21.15	–
Prodiamine	1	Roads	80.81	–
Sethoxydim Naphtha	2	WTD	0.47	–
Sulfometuron methyl	2	Roads, WTD	0.06	221.00
Tetrahydrofurfuryl Alcohol	2	Parks	8.79	–
Triclopyr-2-butoxyethyl ester	2	Parks, Roads, WTD	233.45	–
Triclopyr Triethylamine Salt	1	Parks, Roads, Solid Waste, WLRD, WTD	490.30	–
		Total Pesticide Used	2,597.37	792.15
			Gallons	Pounds

2,4 D is very effective in controlling certain noxious weeds at a reasonable cost. The larger amount reflects the usage in 2017 when the Noxious Weed Control Program received a grant to address a Eurasian watermilfoil infestation.

Aminopyralid is a very effective selective herbicide that controls broadleaf plants but does not kill grass. It has residual activity that acts as a pre-emergent preventing seeds from germinating. Thurston County lists this product as a lower toxicity, Tier Table 2 pesticide.

Imazapyr is the most effective pesticide for controlling Japanese knotweed. It is also effective at controlling loosestrife, which allows applicators to use one product to control both on a site. Thurston County lists this product as a lower toxicity, Tier Table 2 pesticide.

Prodiamine is solely used on gravel road shoulders along King County Road Tier 1-2 roadways (Roads classification of higher priority roadways) in the roadside shoulder spray program. It is a pre-emergent pesticide used to prevent the growth of grasses and broadleaf weeds. Shoulder maintenance is required to protect the assets, public safety, and reduce maintenance costs of mowing and shoulder weed pulls. Unlike mowing, weed growth prevention helps avoid water ponding on the road surface. Water on the road way reduces the life of the pavement and creates safety issues like hydroplaning and ice. The use of Prodiamine is rotated annually to prevent plants from developing resistance.

Triclopyr is an effective selective noxious weed herbicide. Selective pesticides target specific plants under certain conditions. Triclopyr is reasonably priced, quick acting and lower toxicity and can be used in terrestrial and aquatic environments.

Appendices C and D in Appendix A include a summary of use by agency of these Tier Table 1 and 2 products.

B. The status of the King County integrated pest management steering committee

The IPM committee has not formally met since it disbanded in 2010 when participants were satisfied with the ongoing program performance. The City of Seattle continued to host occasional meetings and annual trainings for applicators and maintenance staff, partially funded through the Hazardous Waste Management Program in WLRD. There is new interest in combining city and county Tier Table review and risk assessment efforts for efficiency, consistency, cost, or alternatively, collaborating with Thurston County's IPM Coordinator on product review.

While there is no formal King County IPM committee, the Stormwater Services Section and the Noxious Weeds Control Program staff in WLRD contribute to the Seattle IPM committee and collaborate with suburban cities and members of the NPDES regulated community in sharing IPM policies and practices. Many of these agencies share regional education and outreach efforts and grant funding. It has been valuable to integrate pest management efforts like these to [reduce toxics to Puget Sound](#) and continue to investigate the role of pesticides in ecosystem challenges.

C. Description of the county's efforts, including all agencies listed in response to subsection A. of this proviso, to comply with the Tri-County Integrated Pest and Vegetation Management Model Policy and Guidelines, including any revisions made to the documents since issuance of the executive order

The 1999 Tri-County Integrated Pest and Vegetation Management Model Policy states:

The [adopting jurisdiction] and all of its departments and functions, including contracted services, shall make decisions regarding the planning, design, and maintenance of grounds, landscapes, road and utility rights-of-way, and water bodies within the [jurisdiction] consistent with the principles of integrated pest management (IPM), whenever appropriate. Additionally, if pesticides are used in the course of implementing an IPM program, toxicity, including possible effects on threatened or endangered species as well as public health, will be considered in the selection and application of products.

The policy set the expectation and goal of reducing the use of the most toxic chemicals on county landscapes and for landscape managers to test and apply other techniques for weed control. At that time, the use of IPM practices was not consistent throughout county agencies.

The City of Seattle and the Washington Toxics Coalition created the original criteria to rate pesticide products into tier tables for the Tri-County effort. Thurston County and San Francisco used the same criteria. The King County Tier Tables continue to be used by King County, Seattle, and Thurston County and have had new products added since 2000 and were last updated in 2014 to reflect name changes or reformulations of an existing pesticide. The original methodology in determining a product's status has not changed.

The Tri-County Integrated Pest and Vegetation Management Model Policy, Appendix A, describes the IPM approach and is the basis of the IPM program. Updates to the [2012 King County Site Management Plan \(SiMPla\)](#) were part of the vegetation management guidelines included as part of King County's NPDES permit requirements. It describes the updated cultural, mechanical, and design alternatives land managers use in place of or to reduce pesticide use. Pesticide applicators share their experience with noxious weeds or plant and pest issues at the annual IPM refresher training hosted by Seattle.

Over the past 20 years, the IPM program has made progress consistent with the 1999 Executive Order. The ongoing King County program includes these practices:

- Adoption of the original 1999 IPM policy and guidelines by county agencies.
- County applicators report anticipated Tier Table 1 and 2 product use annually as an exception or conditional use request to the IPM Coordinator. These requests include a description of how the product will be used, general areas it will be used (e.g. flower beds or roadways), for what type of weeds, application methods, and other circumstances. The requests are reviewed against use criteria recommended for that product, approved for that use and recorded.
- Annual product use is tracked on multiple, non-integrated Excel spreadsheets, email, or hand-written records. These are turned in to the IPM Coordinator at the end of the year or the beginning of the following year, depending on the applicators reporting and record keeping practices. Exception and conditional use responses are recorded on separate, non-integrated word documents.

- Annual King County IPM public engagement activities are reported to meet NPDES requirements.
- County applicators adhere to applicable [state and federal rules](#) on pesticide certification and safe use practices.
- King County pesticide managers share pesticide information and practices with regional partners. Seattle is currently restricting the use of glyphosate products and directs an interdepartmental team to update Seattle’s IPM plan and the list of approved pesticides, using a risk-reduction model. Thurston County maintains and shares an online product list (www.co.thurston.wa.us/health/ehipm/terrestrialreview.html) with centralized criteria resources and recommended practices for applicators.
- King County and its NPDES collaborators maintain the [Natural Yard Care](#) and [Resource Reservoir](#) websites to share outreach resources and event opportunities.

D. Attached as Exhibit A, a copy of the Tables 1-4 and incorporated by reference into the executive order, as well as any updates or revisions to those tables

The original 1999 Tier Table 1-3 versions are at:

<https://hazwastehelp.org/ChemToxPesticides/documents/TierHerb05.pdf>. These tables have been updated as products are banned, phased out, reformulated or named, or as new toxicity information is available. Tier Table 4 was originally intended to be mechanical or design techniques to reduce the need for chemicals. Tier Table 4 table was not created, but instead was included on the Grow, Smart, Grow Safe website as the least toxic alternatives (www.growsmartgrowsafe.org).

Product review includes consideration of the [Washington State 25b Minimum Risk Pesticide list](#). This list includes, for example, citric acid, corn gluten, garlic, mint oil, etc. These products are exempt from federal registration under section 25(b) of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), but must be registered with Washington State Department of Agriculture (WSDA) prior to distribution in Washington State.

Multiple criteria are used to evaluate pesticides and their rating. The list below shows the criteria used to balance the risk to fish, habitat, ecosystems and human health, and new products or product formulations are reviewed against this list. That information helps guide the recommended uses of the products, and whether it is a Tier Table 1 or 2 product. Appendix B (included in Appendix A), Tier Tables 1, 2, 3 lists the criteria that qualify a product as a Tier 1, for example, Carcinogen, Reproductive toxin, etc.

This list shows criteria used to evaluate products as a Tier Table 1 or 2 product. The Tier rating of some products can change as new information becomes available on these databases. For more references on the criteria, refer to [Thurston County’s pesticide tables](#). Click on the header for a general description of the criteria. See Appendix B 1999 Tier Tables 1, 2, 3 (included in Appendix A) for general criteria.

Criteria Used to Evaluate Pesticide Toxicity:

- EPA Restricted Use Pesticides
- Washington PBT List (persistence, bioaccumulative, toxic)

- Neurotoxic chemicals
- Mobility
- Signal Word (Caution, Warning, Danger, Poison)
- Carcinogen
- Endocrine Disrupter
- Fish, Bird and Wildlife Toxicity
- [P Waste](#) Washington State's acutely hazardous, toxic "P" listed chemicals
- Reproductive/Developmental Toxin
- Persistence (half-life)
- Bee and Pollinator Toxicity

E. Description of the progress of each county agency listed in response to subsection A. of this proviso, in reducing or eliminating their use of products listed as Tier 1 of Tables 1-4, as required by the executive order

The use by King County agencies of Tier Table 1 and 2 products for 2014 through 2018 is shown in Charts 1 and 2 below. Some increases in Tier Table 1 or 2 product use are related to one-time noxious weed issues such as lakes⁶ infested with milfoil or Japanese Knotweed along waterways.

At a minimum, county agencies are following the 1999 IPM policy and guidelines. County agency pesticide applicators are required to attend an annual refresher training to maintain their pesticides license. There are annual trainings offered by Noxious Weed Program staff and by the City of Seattle. Applicators are required to follow reporting and use tracking guidelines, yearly exception request submittals to the IPM Coordinator, safe storage and disposal practices, labeling, and public notification practices. Pesticide applicators often rotate the products they use to avoid allowing plants to build a resistance to pesticides and to reduce the use of Tier Table 1 or 2 products. Some applicators use experimental, less chemical based approaches to weed problems, trying different techniques and observing how the plants respond over time.

Charts 1 and 2 show the annual total product used of liquid and solid Tier Table 1 and 2 pesticides by all county agencies from 2014 to 2018. Data used to create these charts are in Appendix C Summary of Tier Table 1 Products Used by Agency 2014-2018 and Appendix D Summary of Tier Table 2 Products Used by

⁶ Tier Table levels for pesticides are based on multiple factors including human health, mobility in soil and environmental hazards. Concerns or issues identified in any one area, such as human health, can result in a Tier 1 rating, but that rating does not necessarily indicate a high hazard level in all areas. When the Washington State Department of Ecology evaluates pesticides for use in or near water, it evaluates the potential impacts on fish and other aquatic life. So while many Tier 1 pesticides are not considered safe for use near water based on Tier Table criteria, some Tier 1 pesticides are approved for use in or near water by the Washington State Department of Ecology because they have low toxicity to fish and other aquatic life. In addition, some Tier II pesticides are considered lower risk overall but are toxic to fish so are not approved for use in water by the Washington State Department of Ecology.

Agency 2014-2018 (included in Appendix A). From 2014 to 2018, the total use of all Tier Table 1 and 2 pesticides products combined was 2,597.35 gallons and 792.15 pounds. Of that total, Tier Table 1 pesticide use was 1,096.67 gallons and 571.15 pounds and Tier Table 2 pesticide use was 1,500.68 gallons and 221 pounds. The higher use of Tier Table 2 pesticides may reflect the substitution of some products in place of more toxic alternative Tier Table 1 choices.

Chart 1 Total King County Agency Tier Table 1 and 2 Liquid Product Use 2014-2018

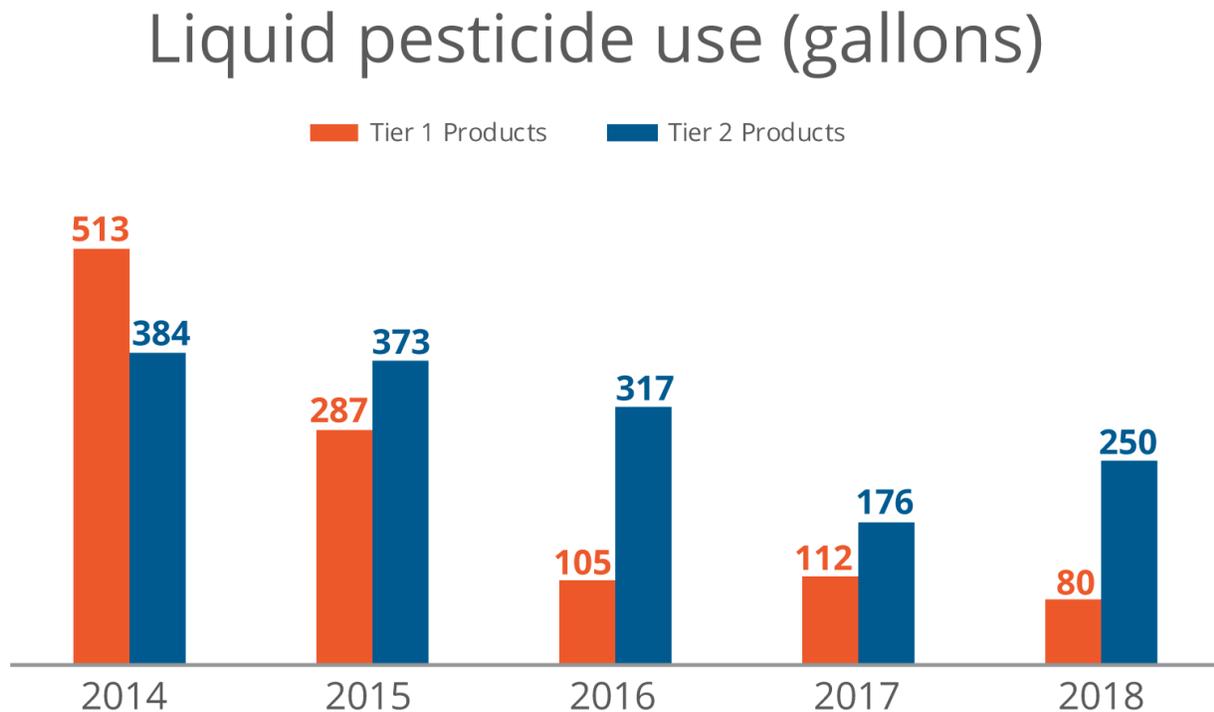
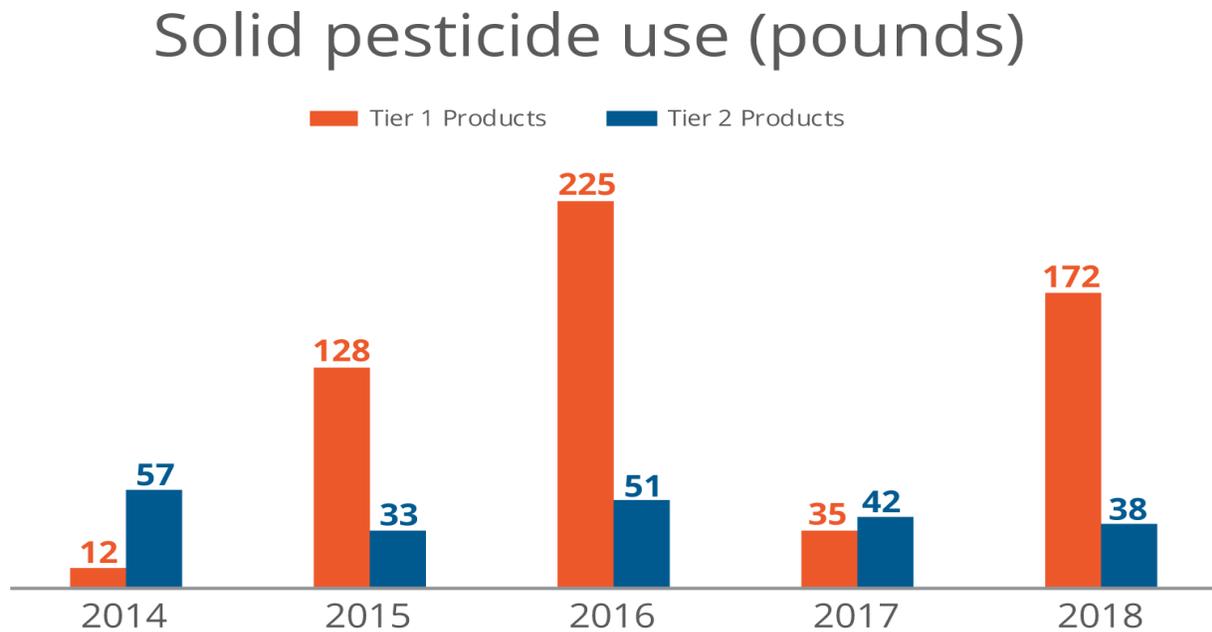


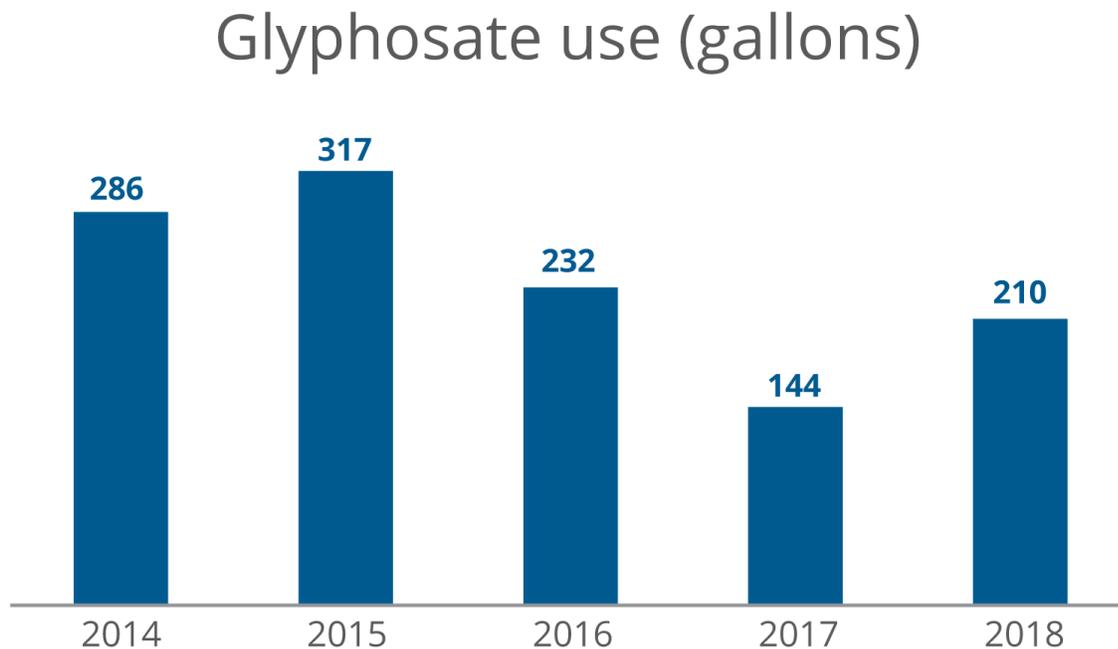
Chart 2 Total King County Agency Tier Table 1 and 2 Solid Product Use 2014-2018



King County agency total annual glyphosate use since 2014 shows that use trends vary. Details of usage by agency is in the Exhibit A, Appendix E tables (included in Appendix A), and show that many agencies often do not apply glyphosate products. Reasons for usage or non-usage vary. Some applicators do not use these products one year, but due to a high concentration of weeds may use them the following year. Conditional use requests for glyphosate do not require specific information on the problem being addressed by an applicator, the volume of product to be used, or specific locations. Final use amounts are reported separately at the end of the season or year.

Glyphosate use in Chart 3 shows consistent glyphosate product usage, in general, from 2014-2018. The total usage between 2014-2018 was 1,188.76 gallons. This may reflect applicators turning to this product in place of more toxic alternative Tier Table 1 products. Usage may increase to address weed management and decrease in following years to prevent weeds from building a resistance to the pesticides.

Chart 3 Total King County Agency Reported Glyphosate Use in Gallons 2014-2018



F. A summary of best practices implemented nationally to reduce the use of chemical herbicides and pesticides by total volume or by pesticide tier

Integrated pest management began [in the U.S. in 1958](#) and is a widely adopted approach to managing pests and weeds using a variety of techniques to minimize economic damage and reduce risks to humans and the environment. Numerous states, agencies, educational institutions, and property managers have adopted these policies and practices. A summary table of example programs, Comparison of IPM programs 2019, is in Appendix F (included in Appendix A).

A review of a selection of IPM programs around the country reveals key program elements related to employee practices and for public information campaigns. A review of best practices shows programs commonly have: a policy, maintenance guidelines, an IPM coordinator and/or advisory committee, approved product lists, periodic product review, annual special use review, and internal record keeping. In general, there are not public information campaigns as well coordinated and designed as pesticide reduction campaigns implemented by King County, the City of Seattle, and its partner agencies. The examples online featured a brochure or web page tips. See Exhibit A Appendix F Comparison of IPM Programs (included in Appendix A) for links and examples.

San Francisco reports the following outcomes: decreased pesticide use by about 70-80 percent since the start of its program; decreased in-City use of glyphosate [by 96 percent since 2010](#). Seattle's IPM

Committee passed a ban on neonicotinoid pesticides on city property and by using ⁷ IPM has had an estimated 80 percent reduction in labor hours associated with pesticide applications since the 1980s and reduced or eliminated pesticide use.

Agencies that make their IPM program information public (San Francisco, Thurston County, Seattle) include reporting and public engagement campaigns to address home and business use of pesticides. Seattle has multiple services and resources for various pesticide users (property owners, landscapers, contractor guidance, home and property owners, and applicators), a list of Pesticide-Free Places, and plans to create an online public pesticides database. San Francisco offers an [online application](#) that shows current trends in pesticide use, with a goal to use pesticide products only as a last resort after other, non-chemical management options have been exhausted and in keeping with certain limitations. Thurston County publishes an annual IPM report recounting pesticide use and noxious weed issues. These agencies offer centralized online compliance toolkits for agency applicators, and similar resources for residents.

G. Information on known impacts of pesticide use to honeybees and its impacts to King County's agricultural areas, including information on neonicotinoids and alternatives

Neonicotinoids are systemic insecticides chemically similar to nicotine. The chemicals are used in agriculture and nurseries, often applied to seeds. Most neonicotinoids are water-soluble and break down slowly in the environment, taken up by plants and used to protect it in early growing phase from sap sucking insects. Chemicals in this family include acetamiprid, clothianidin, imidacloprid, nitenpyram, nithiazine, thiacloprid, and thiamethoxam.

King County applicators do not use neonicotinoid products, according to the annual IPM records, and have not applied this family of insecticides (note: the term pesticides is used in this report to signify “–cide” type products, including insecticide). County pesticide use is mainly limited to herbicides and very limited insecticide use for wasp and mosquito control (the insecticides used for these pests are not neonicotinoids). However, groundskeepers may inadvertently purchase and use plants started from seed, or seed treated with neonicotinoid products. The chemical remains in the plant tissue, pollen and nectar, potentially leading to off target ecosystem impacts.

These chemicals appear to have complicated impacts on the behavior of both domestic and wild bees. Similar to nicotine, they may over stimulate the nervous system of bees making them hyperactive, which causes them to fly shorter distances and for less time, greatly reducing their ability to forage for pollen and food for the hive. The insecticides have multiple effects on bee health (mortality, function, queen and hive health, immunity, etc.), which raises concerns about impacts to other, less studied pollinators.

There has been recent focus on loss of insect biomass, related to climate change, pesticides, habitat loss, and other factors. This is a less understood environmental issue in King County farming and natural areas and has not been the focus of ongoing surveys. King County records regular surveys of the presence of fresh water macroinvertebrates (arthropods) that help identify a stream as healthy, and are

⁷ www.seattle.gov/parks/about-us/policies-and-plans/pesticide-reduction

required under state regulations. Macroinvertebrates are organisms large enough to see and lack a backbone and inhabit streams, ditches, and other flowing waters. These water-based organisms are not tested for the presence of neonicotinoid. A study suggests that neonicotinoids and fertilizers interact to change freshwater invertebrate communities and may lead to changes in ecosystem functioning. A review of existing literature may help our understanding of the potential impact of these chemicals on King County farmlands, bees, pollinators, and ecosystems.

Commercial agriculture may use seeds treated with neonicotinoids. The timing, seed treatment, and planting application can affect the potential release and exposure of pollinators to these chemicals.

Concerns include:

- Exposure of domestic and wild bees to contaminated pollen, dust, and nectar.
- Environmental persistence in agricultural irrigation channels and soil, and build up in aquifers.
- Loss of birds or other populations related to reduced insect populations.
- Off target impacts to pollinators, arthropods.

Neonicotinoids may be present in plants sold in retail and commercial stores and nurseries, and on farms and orchards from pre-treated seeds or the application of neonicotinoids to protect fruit trees. King County's IPM program is not currently offering public information for nurseries, agricultural landowners or residents on neonicotinoids.

H. Recommended actions to strengthen and improve the integrated pest management program, including necessary resources and updates to the integrated pest management guidelines, pesticide tier listings or procedures

Subject matter experts and applicators have discussed recommendations to renew King County's commitment to the IPM program and address new challenges. Recommendations meet three broad objectives: (1) strengthened internal efforts, (2) improved external outcomes, and (3) enhanced support to local jurisdictions and communities. These recommendations help advance the Executive's Clean Water, Healthy Habitat water quality goals and integration objectives, meet NPDES permit requirements, and provide opportunities to integrate IPM goals with the County's ESJ Strategic Plan, Strategic Climate Action Plan, and Best Run Local Government goals.

Recommendations to strengthen King County's IPM program include new work and approaches, and updating, restoring, or expanding existing efforts. While several of these recommendations can be accomplished by updating the 1999 Executive Order, others have associated funding and staffing considerations.

Proposed internal actions include the following:

- (1) Ensure that King County contract language specifies vendors' chemical use and reporting guidelines and participation in the County's IPM program. Contractor guidelines proposed in 2001 have yet to be adopted and provide a transparent and accessible means to track and monitor one of the largest users of chemicals.
- (2) Develop an online tool for internal agency mapping and reporting of pesticide use by building upon the existing King County Noxious Weeds online application. This would avoid creation of a new,

standalone application, streamline record keeping for County applicators, maintain a centralized database, and provide a map of locations to assess and monitor vulnerable residents or areas. This online geospatial tool would provide disparate land managers, applicators, and seasonal staff centralized access to critical information on IPM requirements and help identify ESJ concerns.

(3) Review and update King County’s 2012 maintenance and IPM guidelines to align with new NPDES permit requirements and King County’s adopted goals related to climate change, equity, Best Run Government, and the Local Food Initiative. This would improve the awareness, engagement, and use of the updated guidelines by county land managers and pesticide applicators.

Proposed external and community engagement actions include funding a full-time staff position responsible for managing the IPM outreach and social marketing program. The program historically funded multiple FTEs assigned to different aspects of the program (i.e., IPM coordinator, training, public engagement, etc.). The program currently has 0.2 FTE. This new capacity would follow similar recent steps by other major municipalities, including the City of Seattle, to provide a means to re-invest in IPM-related social marketing-based strategies for programs such as Natural Yard Care, Yard Talk, Grow Smart-Grow Safe, and Pesticide Free Places. Again, this renewed programming would allow opportunities to incorporate climate, ESJ, and Best Run Government objectives. These efforts are currently under consideration as part of King County Stormwater Services strategic plan development and would enhance staff capacity to fully implement those developing goals.

Table 3 Recommendations

Recommendation	Rationale	Comments: relevance or issues to address
Internal Improvements		
1. Update the 1999 Executive Order with current best practices and reflect changing responsibilities, strategy and focus of the program.	<p>There is a lack of clarity about program responsibilities (shift in oversight responsibility, differing Tier Tables, reporting, etc.) and guidelines need updating to reflect new regional priorities.</p> <p>A review of the policy against climate change goals, ESJ, Best Run Government, the Local Food Initiative and other priorities can keep the program relevant and effective.</p>	<p>Address the lack of reporting on IPM practices and product use from county contractors, and keep contractors informed of county best practices. Help build or support contractor’s IPM capacity.</p> <p>By aligning the IPM policy with King County priorities and values, we can incorporate other goals and improve engagement.</p>

<p>2. Consider an online tool for internal agency mapping and reporting pesticide use, taking advantage of and building upon the Noxious Weed Program’s online application information.</p>	<p>This would streamline record keeping for applicators, maintain a centralized database, and provide a map of locations to assess vulnerable residents or areas. This can be used to offer, or as part of, a toolkit for managers and staff.</p>	<p>Recordkeeping is relevant for King County’s tracking of pesticide use, and a geospatial tool would help identify ESJ concerns. An online tool will centralize information and resources for all county agencies.</p>
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Recommendation	Rationale	Comments: relevance or issues to address
3. Review, adopt, and promote the 2012 updated maintenance and IPM guidelines with a new IPM committee.	To integrate updated IPM practices, climate change considerations, and green stormwater design and maintenance.	Improve the awareness, engagement and use of the updated guidelines and best practices by county property managers and pesticide applicators.
4. Implement regular updates to the Pesticide Tier Tables, identifying alternatives, incorporating emerging issues such as climate change, environmental justice, demographic shifts, new understanding of pesticides' impacts to ecosystems, risks to life stages of salmonid populations, insects, soil or groundwater, exposure, toxicity, and risk assessment communication. Collaborate with Seattle or Thurston County on the updates to share criteria and staff, or through a contract service.	The current pesticide criteria are functioning as intended. Ongoing research on pesticides and their impacts offers new understanding of science or issues (e.g. pesticide mechanisms and impacts on honeybees). Regular reviews and reprioritization help keep the Tier Tables current and provide an updated assessment of these products on ecosystem and salmon health.	There are new risk criteria and understanding of ecological and human impacts needed to update the tables. Updating the criteria with WLRD Science Section staff or partners will help with succession for the program.
Community engagement and support to communities and jurisdictions		
5. Consider funding a position responsible for managing the IPM program.	The program formerly had multiple FTEs assigned to different aspects of the program (IPM Coordinator, training, public engagement, etc.), and currently has 0.2 FTE.	Aspirations associated with IPM objectives are not being met through existing resources.

Recommendation	Rationale	Comments: relevance or issues to address
<p>6. Consider an approach to public reporting and internal and external audiences, creating a web application strategy and tools such as the suspended Pesticide-Free Places, creating and posting annual reports, or centralized online information on pesticide practices.</p>	<p>The strategy for Pesticide-Free Places had several objectives:</p> <p>1) to offer residents information on pesticide free and reduced places to take their family,</p> <p>2) as a way for land managers to highlight their efforts to reduce pesticides, and</p> <p>3) to offer training and coaching for land managers to incorporate IPM practices.</p> <p>Annual reports, centralized information, and website updates would provide public information and transparency.</p>	<p>Users still have interest in Pesticide-Free Places and the county receives occasional inquiries about the website or requests for similar information. Land managers self-reported the status of their sites and had an opportunity to promote their efforts.</p> <p>Producing annual reports will add to the time and effort required of the IPM Coordinator and other staff.</p>
<p>7. Consider reinvesting in IPM-related social marketing-based strategies for programs, services and websites such as Natural Yard Care, Yard Talk, Grow Smart-Grow Safe, Pesticide Free Places, Weed and Feed: Four Reasons to Kick the Habit, and the Good Bug guide.</p>	<p>Regional cities, counties and nonprofits collaborate on social marketing projects and local Natural Yard Care based programs. The program could benefit from an improved strategy to incorporate tribal interests and engagement, build on the existing assets, and update popular elements with residents and businesses.</p> <p>This outreach program also helps King County and its partners meet NPDES requirements.</p>	<p>The Natural Yard Care programs have engaged thousands of residents in rethinking how their yard fits into local ecosystems. This program offers multiple “gateway” interests for residents and businesses and remains popular.</p> <p>This would address a gap providing residents information on reducing toxic products, particularly in other languages besides English, and in programs like Natural Yard Care.</p>

Recommendation	Rationale	Comments: relevance or issues to address
8. Identify and fund environmental studies that address the gaps in our understanding of the ecological health impacts of pesticides.	The studies of pesticides’ impact in soil, water, wastewater, fisheries or ecosystems are limited. Without updated information on the status of pesticides in the environment, it is challenging to fully understand and quantify the impact of these chemicals and design effective programs to address issues.	This effort would require research staff, partners, risk assessment, grants and grant managers, which all demand time from existing work plans. Pesticide sampling and studies are expensive. The most recent study in 2004, King County teamed with United States Geological Survey (USGS) for studies of pesticides in urban streams detecting 39 compounds with the most frequently detected herbicides and insecticides sold for homeowner use.

VI. Conclusion and Next Steps

In the twenty years since the 1999 Executive Order that directed county agencies to create an IPM program was implemented, King County has made progress in pesticide reduction, safe disposal, maintenance practices, and staff training. Working with partners, homeowners, nurseries, landscapers, hardware store staff, and garden writers helped create a regional norm and behaviors among Pacific Northwest residents who desire a less toxic environment.

The judicious use of pesticides is critical to addressing invasive plant species that threaten the region’s economy, agriculture, ecosystem and human health. IPM is a proven and highly effective strategy to maintain landscapes using less toxic methods.

King County’s current IPM program does not allow for improvements or updates to the original intent of the 1999 Executive Order. The region is facing multiple, complex environmental challenges, including climate change, that will influence the behaviors of noxious weeds. King County is also experiencing an unprecedented influx of new residents, creating new audiences for IPM information. The tools to update and modernize the program exist, but this effort would be challenging with the current limited staffing capacity and engagement budget.

This is an opportunity for King County to review its commitment to the original goals of the 1999 Executive Order, address gaps, and modernize the IPM program to address new and unanticipated challenges. King County’s IPM program represents 20 years of thoughtful pest management by county applicators and collaboration, and investment by cities, counties, businesses, and partners that has paid off in changing regional norms, values, and actions to reduce chemical use. The recommendations of this report offer choices to update the program, prepare for changing climate, and integrate new information on the impact of these chemicals on the environment, on habitat, and on our communities.

Appendix A 1999 Tri-County Model Policy and Management Guidelines

Tri-County Integrated Pest and Vegetation Management: MODEL POLICY

August 12, 1999

Contents:

- Section 1. Purpose
- Section 2. Policy
- Section 3. Definitions
- Section 4. Procedures and Responsibilities Section
- 5. Changes to this Policy

Section 1. Purpose.

The purpose of this policy is to direct all operations of [adopting jurisdiction within the Tri-County area] that manage pests or vegetation on public lands, rights-of-way and bodies of water to do so in an environmentally sensitive manner while addressing public health, safety, economic, legal and/or aesthetic requirements. The policy is intended to provide a common basis for pest and vegetation management by [adopting jurisdiction] that will protect endangered and threatened species as well as public health and that will reduce the volume and toxicity of pesticides used. The policy applies to internal governmental operations plus contracted services, but not to the residents or businesses of [adopting jurisdiction].

However, it may serve as a model for anyone interested in reducing the environmental impact of pest and vegetation management in the central Puget Sound area.

Section 2. Policy.

The [adopting jurisdiction] and all of its departments and functions, including contracted services, shall make decisions regarding the planning, design, and maintenance of grounds, landscapes, road and utility rights-of-way, and water bodies within the [jurisdiction] consistent with the principles of integrated pest management (IPM), whenever appropriate. Additionally, if pesticides are used in the course of implementing an IPM program, toxicity, including possible effects on threatened or endangered species as well as public health, will be considered in the selection and application of products.

Section 3. Definitions.

Integrated Pest Management ("IPM"): (From 17.15.010 RCW) 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 programmatic pest management objectives. The elements of integrated pest management include:

- a) Preventing pest problems;
- b) Monitoring for the presence of pests and pest damage;
- c) Establishing the density of the pest population, that may be set at zero, that can be tolerated or correlated with a damage level sufficient to warrant treatment of the problem based on health, public safety, economic, or aesthetic thresholds;
- d) Treating pest problems to reduce populations below those levels established by damage thresholds using strategies that may include biological, cultural, mechanical, and chemical control methods and that must consider human health, ecological impact, feasibility, and cost- effectiveness; and
- e) Evaluating the effects and efficacy of pest treatments.

IPM program: A program that is developed to implement the Integrated Pest and Vegetation Management Policy within [adopting jurisdiction]. The program includes, but is not limited to, general approaches to be used by the [jurisdiction] to implement the IPM policy, management plans specific to types of sites or pests, training requirements, record keeping and evaluation practices.

Pest: Any insect, rodent, nematode, snail, weed, fungus or other form of plant or animal life that adversely interferes with the aesthetic, health, safety, environmental or economic goals of the jurisdiction. Pest shall not include viruses or microorganisms on or in a living person or animal, but shall include plant diseases.

Pesticide: A chemical agent registered as a pesticide by the Washington State Department of Agriculture, which can be an herbicide, insecticide, fungicide or other chemical that repels, changes the regular growth rate of, kills or otherwise reduces levels of a targeted pest or pests.

Section 4. Procedures and Responsibilities.

- A. IPM Program.** The [adopting jurisdiction] or an individual department or division within [jurisdiction] that controls pests or manages vegetation shall develop and implement a written integrated pest management program consistent with this policy. The IPM program may contain, but is not limited to, general approaches to be used by [jurisdiction] to implement the IPM policy; planning, design and maintenance standards consistent with the IPM approach for landscapes, rights-of-way, and bodies of water; pest tolerances (injury and action levels); typical pest management strategies for common sites or pests; noxious weed control plans; specific pesticide limitations; training plans; and monitoring, record-keeping and evaluation strategies. The IPM program should use as its basis the most recent edition of the Tri-County Pest and Vegetation Management Guidelines.
- B. Training.** The [implementing jurisdiction] shall provide appropriate training for its employees on this policy and the [jurisdiction's] IPM program.
- C. Program Review and Coordination.** The [adopting jurisdiction] shall establish an internal steering committee to develop the IPM program and to monitor its implementation. The steering committee shall include representatives from each department/division responsible for pest or vegetation management. The committee shall meet periodically to evaluate progress and experiences in implementing the [jurisdiction's] IPM policy, as well as to suggest revisions to the [jurisdiction's] IPM program.
A Tri-County coordinating committee, known as the Tri-County Integrated Pest and Vegetation Management Committee, will be established as part of the Tri-County Endangered Species Act response. This Tri-County committee will be made up of a designated representative from each jurisdiction that has adopted and is implementing the Integrated Pest and Vegetation Management Model Policy. This Tri-County committee will share information across jurisdictions that are implementing the Model Policy. In addition, this committee will serve as the vehicle for proposing substantial changes to the Model Policy, and/or to its supporting Guidelines, in coordination with all participating jurisdictions. The [adopting jurisdiction] shall participate in this Tri-County committee as appropriate.
- D. Public Information.** Information and advice regarding pest and vegetation management given to the public, land owners, private businesses or other jurisdictions shall be consistent with this policy.

Section 5. Changes to this Policy.

IPM promotes learning and adapting based on experience, a process known as adaptive management. Periodic review or emergency situations may result in the need for modifications and additions to this policy and/or the [jurisdiction's] IPM program over time.

- A. Internal review process.** Once the [jurisdiction's] steering committee referenced in Section 4.3 has developed an IPM program, it shall meet periodically (at least annually) to consider input from departments or divisions that have experience implementing the policy and its IPM program. The committee will revise the IPM program and/or specific prescriptions as needed, consistent with this policy. The committee will consider revised editions of the Tri-County Integrated Pest and Vegetation Management Guidelines for incorporation into its IPM program as appropriate.
- B. Tri-County review process.** The Tri-County Integrated Pest and Vegetation Management Committee referenced in Section 4.3 will meet periodically (at least annually) to consider input from individual jurisdictions that have adopted the Model Policy and have experience implementing it. Based on evaluation of the policy's implementation, modifications may be suggested by the committee for consideration by all jurisdictions. Suggested changes to the Model Policy will be circulated to participating jurisdictions for individual consideration.

The Tri-County committee will periodically update the Tri-County Integrated Pest and Vegetation Management Guidelines based on experience of its members, and disseminate revised editions of its Guidelines to all participating jurisdictions for their consideration in IPM program revisions.

- C. Emergency/Short-term process.** There may be situations where the [jurisdiction] or one of its departments/divisions cannot wait for formal review processes to take place. An example is the introduction of a new and destructive pest that needs to be treated within a short time frame. In such a case, the [jurisdiction's] internal steering committee will meet on an emergency basis and develop a specific IPM strategy to deal with the threat, consistent with the intent of this policy and using appropriate internal and Tri-County expertise.

Tri-County Integrated Pest and Vegetation Management: GUIDELINES

August 12, 1999

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Section 1. Purpose.

The purpose of these Guidelines is to offer consistent and constructive advice to jurisdictions that adopt the Tri-County Integrated Pest and Vegetation Management Model Policy. The policy calls for each adopting jurisdiction (or departments/divisions within a jurisdiction) to develop an IPM program containing general implementation steps as well as specific maintenance standards and IPM strategies. These Guidelines offer clarifying information about the IPM approach in general and about specific practices appropriate to waterways and buffer zones, road rights-of-way, developed landscapes, lawns and turf, natural open spaces, noxious weeds, electrical facilities, and pesticide handling. It is the intent of these Guidelines to serve as the basis of each jurisdiction's IPM program.

It is also intended that these Guidelines will be periodically revised based on new research and implementation experience. Revised editions of these Guidelines will be developed and disseminated to participating jurisdictions by the Tri-County Integrated Pest and Vegetation Management Committee.

Revised Guidelines can be implemented through incorporation in a jurisdiction's IPM program without each jurisdiction having to go through the potentially lengthy process of amending its adopted policy.

Section 2. IPM Approach

The definition of Integrated Pest Management in Section 3 of the Model Policy provides a basic description of an IPM approach to pest and vegetation management, from Washington State law (17.15.010 RCW).

Keys to an IPM approach include: 1) its integrated nature, involving planning and design of the landscape, facility or roadway, as well as maintenance practices and specific pest control tactics; 2) its preventive nature, emphasizing a wide variety of maintenance practices to promote appropriate and healthy growth; 3) its emphasis on knowledge about the pest and regular monitoring of pest levels as well as evaluation of

control methods applied; and 4) use of "management" and "control" approaches in preference to elimination or eradication - except in cases of certain noxious weeds and specific situations where the tolerance threshold may be zero. In general, IPM establishes an approach to manage pest problems within tolerable limits.

The IPM approach encourages planning, design and maintenance of landscapes, rights-of-way and facilities that meet their intended purposes while promoting healthy plants (where appropriate) and minimizing pest problems. The IPM approach follows a continuum that begins with careful planning, design and construction decisions followed by appropriate maintenance and management of public lands, facilities and water bodies by employees with up-to-date training.

The IPM approach emphasizes a thorough knowledge of the pest or vegetation problem, pre-determined tolerance thresholds, regular monitoring to determine when those levels are met, and treatment of the pest or vegetation problem with appropriate cultural, mechanical, biological and, where needed, chemical tactics. Tolerance thresholds are set at levels that keep pest numbers or vegetation problems low enough to prevent intolerable damage, annoyance or public safety hazards while remaining economically and environmentally feasible.

IPM encompasses the use of chemical controls specifically in situations where they may be the most environmentally responsible or safest way to deal with a problem, or where other control tactics have proven ineffective at meeting tolerance levels. When chemical controls are necessary, decisions on their use will consider any possible effects on aquatic life (toxicity) and any tendencies for the chemical to move in the environment (mobility). Decisions on chemical use are made in conjunction with other control methods that are effective and practical.

A. Components of an IPM approach include:

1. **Planning & Design.** A landscape, facility or road right-of-way should be planned and designed taking into account parameters that will enhance intended uses of the land and minimize pest problems. Design takes into account such factors as types of uses, soils, grading and slope, water table, drainage, proximity to sensitive areas, selection of vegetation, and vector control issues.
2. **Maintenance for maximum landscape health.** Choices of vegetation as well as maintenance practices serve to keep areas as healthy as possible and thus minimize pest problems. Appropriate selection and retention of plants, irrigation, application of mulch or fertilizer, mowing, and many other practices all serve to maintain healthy landscapes that withstand pest pressures and support natural predators for pests. A well-selected and maintained landscape reduces, often dramatically, the need for pest control.
3. **Knowing the pest.** Identification of pests and knowledge of their life cycles are crucial to proper management. Potential pests should be documented and actual pests carefully identified in order to clearly focus IPM strategies. Field staff needs the opportunity for training in pest identification and the time to conduct regular assessments.
4. **Determining tolerance thresholds.** Tolerance thresholds must be established. They may vary by pest, specific location or type of land use. Weed threshold levels, for example, will be different for rural utility rights-of-way, urban ballfields, golf course greens and road shoulders. Insect or plant disease tolerances will likewise be different depending on uses and/or specific locations. Three distinct levels may be identified as subsets of threshold determination. The initial Injury Threshold is the level at which some injury begins to occur or is noticeable. The Action Threshold is the level at which action must be taken to prevent a pest population at a specific site from reaching the aesthetic, functional or economic Damage Threshold, the level where unacceptable damage begins to occur. In most environments certain levels of pest presence or injury can be accepted. IPM practitioners keep careful track of pests after the injury threshold is crossed so the pests do not get to the point where they can cause enough damage to impact the purpose of the landscape or facility being maintained. When the predetermined action threshold is crossed, interventions are implemented so as to avoid reaching the damage threshold.

5. **There are situations where the threshold level for pests must be set near or at zero.** Laws and regulations set the population threshold level at zero for Class A noxious weed species due to potential for economic injury, public health or environmental impact. Road shoulders immediately adjacent to the pavement are areas where weed tolerance is low due to public safety requirements and potential for significant economic losses should the paved roadway surface be compromised. Safety and infrastructure protection also factor into the determination of very low or zero thresholds for weeds in areas such as electrical substations and propane tank storage yards.
6. **Monitoring for pests.** Regular monitoring to assess pest level, extent, locations and stage in life cycle is important. Assessment relative to established tolerances is necessary. Field staff needs the opportunity for training in pest monitoring techniques and the time to allow for appropriate monitoring.
7. **Developing the IPM plan.** The following elements should be considered when selecting appropriate strategies:
 - a) Preservation of natural systems and long-term health of the area;
 - b) Damage to the general environment;
 - c) Disruption of those natural controls which are present;
 - d) Hazards to human health;
 - e) Toxicity to aquatic life, including all aspects of salmonid life cycle and salmonid foods;
 - f) Mobility and persistence in the environment;
 - g) Impact to non-target organisms;
 - h) Timing relative to vulnerable periods in the pest's life cycle with the least impact on natural enemies;
 - i) Ability to produce long-term reduction in the pest;
 - j) Ability to be carried out effectively;
 - k) Cost effectiveness in short and long term;
 - l) Ability to be measured and evaluated.
8. **Implementing the IPM plan and selected strategies.** Well-trained field staff should fully implement the strategies selected and record the steps followed and management methods used.
9. **Monitoring and evaluation.** Effectiveness of the IPM method(s) employed should be measured, records kept and an evaluation process conducted in order to regularly assess how well it is working to bring about the desired result(s). Field staff needs time allocated for appropriate monitoring and record keeping, as well as opportunities for training and discussion in evaluation processes. Record keeping does not have to be elaborate or time-consuming; it can be as simple as keeping a field notebook or log book to aid later evaluation.
10. **Learning and revision.** Results of application of specific IPM strategies as well as the IPM program as a whole should be reviewed regularly and revisions made as appropriate based on experience.

B. Management methods to be incorporated in an IPM approach include:

1. **Cultural** - management activities that prevent pests from developing due to enhancement of desirable vegetation which out-competes or otherwise resists the pests, including but not limited to irrigation, seeding, fertilizing, mulching, pruning and thinning.
2. **Physical or Mechanical** - management activities performed using physical methods and/or mechanical equipment such as hand removal, baits, traps, barriers, mowers, brushcutters, flame or hot water weeders, blades, hoes, string trimmers, or other physical means to control pests (including undesirable vegetation).
3. **Biological** - management activities performed using insects, animals, birds, diseases or competing vegetation to control pests (including undesirable vegetation). Appropriate permits should be obtained from WSDA, USDA, EPA or applicable agency before release of any predator. Local noxious weed control boards should be notified of any biological control releases for noxious weed control.
4. **Chemical** - management activities performed using chemical agents registered as pesticides by the Washington State Department of Agriculture.

- C. Record keeping is an important element of an IPM program.** The following are examples of records that may be maintained as part of an IPM program:
1. **IPM program:** The jurisdiction's written IPM program kept in accessible location(s).
 2. **IPM strategies:** Site- or pest-specific management plans.
 3. **Pest identification and assessment:** Records of documented pests, including date, specific location, name, reference used for identification and/or corroborating expert (if appropriate), stage of life cycle, extent of pest presence and other pertinent information.
 4. **Maintenance:** Methods performed to minimize pest populations and enhance healthy plant growth.
 5. **Control methods implemented:** Control methods employed per the IPM strategy selected, including dates, location and other pertinent information.
 6. **Pesticide applications:** If chemical methods are employed, pesticide application records as required by the WSDA, including but not limited to licensed applicator's name, application target or site, chemical name, brand name, area of application, concentrations used, amount and rate of application, coverage rate, equipment used, weather conditions including temperature and wind, and date and time intervals of application.
 7. **Monitoring:** Records documenting site or pest-specific observations that may include results of IPM methods used. Monitoring records are key tools for evaluating management strategies to allow assessment and revision as needed. Revisions should be documented.

It should be emphasized that record keeping need not be burdensome. Simple field notebooks or logs can easily cover the majority of records kept, so that follow-up evaluation of what worked or didn't work and what to do differently in the future can be accomplished.

- D. Training permanent and seasonal employees** on the basics of the IPM policy, the jurisdiction's IPM program and specific maintenance standards and IPM strategies will help ensure that they are understood and consistently followed. Implementing the IPM approach from design through daily maintenance will eliminate unnecessary applications of chemicals that could damage salmonid fishes or their habitat. In addition, full implementation of a well-understood IPM approach will create a more efficient and safe environment, saving time and money and increasing worker safety.

The following paragraphs provide guidelines for developing a training plan:

1. All staff associated with the planning, design, construction, and maintenance of parklands, roads, rights-of-way, park and ride lots, electrical substations, golf courses, other landscaped buildings and facilities and other areas where vegetation is managed and where pests may need to be controlled should receive an orientation to the IPM policy, the jurisdiction's specific IPM program and these Guidelines.
 2. Gardeners and laborers responsible for vegetation management should receive training on:
 - a) An overview of Integrated Pest Management including identification and life cycles of typical Northwest pests, weeds and beneficial insects; determining threshold levels for different types of landscapes; and monitoring techniques.
 - b) Noxious weed identification, control and regulations.
 - c) Pesticide laws and safety.
 - d) Specific Best Management Practices as appropriate.
 3. Staff responsible for maintaining and scheduling irrigation systems should receive training on:
 - a) Irrigation system maintenance and how to conduct audits.
 - b) Scheduling based on evapotranspiration and seasonal fluctuations.
 - c) Backflow prevention.
 4. To the extent practicable, IPM training should be shared across jurisdictions within the Tri-County area.
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Section 3. Specific Guidelines.

A. Waterways and Buffer Zones.

The Tri-County jurisdictions recognize the special sensitivity of Puget Sound and the freshwater rivers, streams, lakes, ponds, drainage systems and water quality facilities that fall under their stewardship. Pesticide use guidelines have been developed in an effort to minimize the potential for pesticides to enter waterways and impact these sensitive habitats, including impacts to threatened or endangered species. This subsection establishes guidelines and limitations regarding maintenance methods and materials for waterways and the lands adjacent to them.

It is the intent of these guidelines to complement the special management zones and buffer zones being established as part of the Tri-County ESA response. Management of existing, developed landscapes adjacent to water bodies is considered maintenance, not precluded by the proposed ESA management and buffer zones. Pesticide use (or restrictions thereof) within ESA management and buffer zones should be consistent with the intent of the zones. Critical or sensitive areas ordinances of local jurisdictions should be consulted as well; the most restrictive rules or guidelines should be the ones followed.

1. Definitions.

- a) **Bioswale** is a vegetated drainage ditch or other open water course designed to filter runoff by the direct contact between surface water and the vegetation growing in the channel. A bioswale is an engineered drainage course, part of the surface water management system.
- b) **Buffer zone** referred to in this policy is 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 top of the stream bank. Anticipated seasonal or weather related changes affecting water level will be included in the decision making process when dealing with buffer zones. Measurement of the buffer zone in areas adjacent to tidal waters starts at the mean high tide line.
- c) **Waterway** refers to an open waterbody such as Puget Sound, a river, stream, lake or pond, and includes a biofilter, pollution reduction facility, roadside ditch or bioswale when water is present.

- 2. **Record Keeping.** Records will be kept of all pesticide applications as required by Washington Department of Agriculture and as described in Section 2 (C). Additionally, when pesticide application occurs within a buffer zone, this will be clearly noted on the application record to facilitate tracking. Jurisdictions will conduct an annual review of pesticide applications to buffer zones and waterways to evaluate the potential for further reducing pesticide use in these areas.

- 3. **Buffer Zone General Guidelines.** When pesticides are applied within a buffer zone, great care will be exercised. The following general guidelines apply to all pesticide applications in buffer zones:
 - a) Pesticide selection should consider persistence, mobility, and aquatic toxicity.
 - b) Pesticides should not be applied in buffer zones of waterways with known populations of federal- or state-listed threatened or endangered species during periods when early life stages are present.
 - c) Pesticides should not be applied when weather conditions increase the possibility of runoff or drift (e.g. when wind speed is > 5 mph.).
 - d) Equipment, including nozzle size, pressure regulation, droplet size, and height of spray wand, should be selected to limit drift.

- 4. **Buffer Zone Specific Guidelines.** Pesticide applications in buffer zones should be consistent with the following specific guidelines based on four classifications (A,B,C,D) that describe their current features, as well as define the differing objectives and maintenance rationales of their care. The matrix following the buffer zone classifications provides pesticides use guidelines for each classification depending on whether they are being used for routine maintenance or for restoration and construction projects. Each jurisdiction is encouraged to group individual landscapes or grounds within these Buffer Zone Classification categories.

5. Buffer Zone Classifications

A. Highly Managed Areas

FEATURES	OBJECTIVES
Ornamental landscape	Healthy plants and turf
Public access and activity	Maintain ability to handle high use
High public use	Minimize need for chemical intervention
May have mowed turf, sometimes to edge of waterway	Control invasive plants
May have facilities adjacent to water	Safe access
May have highly modified stream banks	No bare soil areas, except where required for protection of assets
Often limited plantings in buffer	Low tolerance for weeds
Electrical substations	May have high expectation for aesthetics in general
Vegetation managed for safety and protection of assets.	

B. Intermediate Managed Areas

FEATURES	OBJECTIVES
Stream banks have some buffering with predominately native plants	Maintain healthy plant buffers
Some impacts from use and park development apparent	Minimize need for chemical intervention
Managed landscapes may be nearby	Control invasive plants where feasible
Stream bank erosion may be occurring due to use	Minimize impact on buffer
	No bare soil areas
	Tolerance for natural appearance and weeds
	Control noxious weeds

C. Impacted Natural Areas

FEATURES	OBJECTIVES
Very limited impact to these areas.	Maintain healthy plant buffers
Stream banks have buffering with predominately native plants	Minimize need for chemical intervention
Limited impacts from use and park development apparent	* Low tolerance of invasive plants, non-natives
Managed landscapes are not nearby	* Minimize any impacts on buffer
	* No bare soil areas
	Control noxious weeds
	-

D. Intact Natural Areas

FEATURES	OBJECTIVES
Very limited visitor impact	Maintain healthy plant buffer
Native plant communities exist	Low tolerance of invasive plants, non-natives
No nearby developed park areas	Maximize existing healthy ecosystem functions
	Minimize any impacts from activities
	Control noxious weeds

Use of Herbicides within Buffer Zones of Waterways

HERBICIDE USE	ACTIVITY	D INTACT NATURAL AREA	C IMPACTED NATURAL AREAS	B INTERMEDIATE MANAGED AREAS	A HIGHLY MANAGED AREAS
Pre-emergent herbicide use possible	Routine Maintenance	No	No	No	Use only when weeds pose safety hazard.
Pre-emergent herbicide use possible	During Construction, Restoration	No	No	No	Use only when weeds pose safety hazard.
Post-emergent herbicide use possible	Routine Maintenance	Spot spray noxious and invasive weeds if necessary. Cut and treat stems of woody species.	Spot spray noxious and invasive weeds if necessary. Cut and treat stems of woody species.	Spot spray only. Cut and treat stems of woody species.	Spot spray only. Cut and treat stems of woody species.
Post-emergent herbicide use possible	During Construction, Restoration	Spot spray noxious and invasive weeds if necessary. Cut and treat stems of woody species.	Spot spray only. Cut and treat stems of woody species.	Spot spray. Broadcast spray for invasive species only. Cut and treat stems of woody species.	Spot spray and broadcast spray if necessary. Cut and treat stems of woody species.

6. **Pesticide Use within Waterways.** The use of pesticides in or on water shall comply with Washington State Department of Agriculture and Department of Ecology regulations. Jurisdictions should contact the local noxious weed program when managing noxious weeds in aquatic habitats (see Section 3 (F)). The following describes specific practices that may be used within the actual bodies of water. Pesticides should not be applied in waterways with known populations of federal-listed threatened or endangered species during periods when early life stages are present.
- a. **Within Streams.** In the rare need for control of noxious weeds or invasive weeds or non-native plants within a stream itself, mechanical and biological means will be utilized where feasible. When these methods are not feasible, emergent weeds may be controlled with an herbicide approved for aquatic use after obtaining appropriate permits from the Washington State Department of Ecology.

- b. **Within Pond and Lake Areas.** Within a pond or lake, herbicides will be used only for the control of noxious or invasive weeds and non-natives that threaten the health of the habitat. When chemical methods are necessary within a pond or lake, only herbicides approved for aquatic application should be employed and only after obtaining appropriate permits from the Washington State Department of Ecology.
 - c. **Within Biofilters and Pollution Reduction Facilities (PRFs).** Biofilters and PRFs intercept stormwater run-off from land surfaces in order to improve the quality of the drainage discharge to natural waterways. For post emergent applications, PRF buffers should be treated as class B streamside buffers.
 - d. **Within Bioswales.** If the bioswale has an outlet to surface water, its treatment will follow the same restrictions as a class B streamside buffer. If a bioswale does not discharge to surface water, the buffer is not covered under this waterways section of the policy; however, standard IPM guidelines apply.
7. **Special Exception Areas.** Special exceptions to these waterways and buffer zone guidelines address municipal golf courses:

Waterways and Buffer Zones at Municipal Golf Courses. The nature of the current layout of many golf courses places golf greens near to waterways in some limited instances. In these specific areas, buffers are variable in width, and may be smaller than 25 feet. In limited areas, buffers may be reduced to as little as 10 feet due to proximity of golf greens to existing waterways. Special golf course buffer widths should never be less than 10 feet. Locations of these variances should be mapped and recorded. These variance areas are few in number and amount to a very small percentage of overall water frontage. In new construction or renovation and design of golf courses, placement of greens to allow establishment of standard width buffers is recommended. Incorporation of intercepting buffers is also encouraged where feasible. These intercepting buffers can be situated so that any possible runoff flowing towards open water is diverted into planted drainage systems and biofilters.

- a. **Routine Golf Buffer Maintenance Practices.** There should be no application of broadleaf herbicides to turf in buffer areas.

B. Road Rights-of-Way.

Roadside vegetation management within the Tri-County area varies from urban to rural settings. It is the intention of road and street maintenance divisions under this policy to approach vegetation management from an IPM standpoint that encourages protection of water quality and fish habitat. These specific road right-of-way guidelines apply generally to undeveloped roadways without curbs and sidewalks, and do not apply to such developed street areas as landscaped medians, islands and planter strips; the latter areas are covered under the developed landscapes guidelines in Section 3 (C).

Roadside vegetation maintenance activities are subdivided into the four basic control or management methods that cover the scope of integrated pest and vegetation management. These four areas of control are cultural, physical/mechanical, biological, and chemical, as described in Section 2 (B). Specific actions within each area are considered Best Management Practices for road right-of-ways.

- 1. **Benefits.** All four of these integrated options, when used alone or in conjunction with each other, provide positive outcomes to essential functions of the roadway and the safety of the traveling public. Some of these benefits are as follows:

- a) Public safety
- b) Improved drainage
- c) Reduced icing
- d) Reduced fire hazard
- e) Promotion of non-motorized use
- f) Reduction in the spread of noxious weeds and undesirable vegetation
- g) Limited erosion
- h) Increased biofiltration
- i) Improved visibility of signs and structures
- j) Facilitation of the inspection and maintenance of other features and structures
- k) Improved visibility of shoulder for emergencies and obstacles

- l) Increased sight distance
 - m) When used in conjunction with each other, lower herbicide use.
2. **Cultural Control Methods:**
 - a) Hydroseeding products should not enter flowing water, wetlands, ponds, or lakes.
 - b) Woody debris resulting from pruning or thinning should be removed from sensitive areas as required, except in the case of large woody debris specifically required to be left in a stream or other waterway as part of fish habitat enhancement plans.
 3. **Physical/Mechanical Control Methods:**
 - a) Avoid cutting material on the backslope over running water.
 - b) Pick up litter and woody debris from water, ditches and slopes in sensitive areas.
 - c) Recycle wood products when feasible.
 - d) Mow grass and brush at heights that avoid "scalping" of soil.
 - e) Mow native vegetation at heights that promote its growth.
 - f) Carry spill kit appropriate for equipment used.
 4. **Biological Control Methods:**
 - a) Incorporate biological controls, such as use of beneficial predators, into road IPM practices wherever appropriate.
 - b) Obtain appropriate permits.
 5. **Chemical Control Methods:**
 - a) Use only as part of an integrated approach to pest and vegetation management.
 - b) Follow all Washington State Department of Agriculture regulations pertaining to pesticide application (see Section 3 (G)).
 - c) Follow the Waterways guidelines in Section 3 (A) when within 25 feet of any waterway.
 - d) Use only State registered pesticides.
 - e) Follow all label directions.
 - f) Do not spray in windy or wet conditions.
 - g) Do not spray within "Owner Will Maintain" areas.
 - h) Do not spray within eroded areas where vegetation would be beneficial.
 - i) Carry spill kit appropriate for equipment and pesticide used.
 6. **"Owner Will Maintain" program.** When appropriate, participating jurisdictions should offer property owners the option of maintaining the right-of-way adjacent to their property in lieu of regular maintenance activities by the public jurisdiction. The "Owner Will Maintain" program typically applies to owners who wish to maintain their road-side properties to meet applicable standards without the use of herbicides. The "Owner Will Maintain" program should be advertised annually with adequate notice for property owners to participate in the program prior to application of herbicides or other pesticides by the public jurisdiction. Conditions of the agreement as it pertains to adequate control will be at the discretion of the local jurisdiction.

C. Developed Landscapes.

Many parks, public grounds, yards surrounding public buildings and other facilities, and groomed roadside medians, islands and planter strips along urban streets are developed landscapes to varying degrees. These landscapes require careful design and maintenance in order to maximize their desired uses while minimizing pest problems. The following specific guidelines apply to these developed areas:

1. **Planning and Design.** A successful landscape requires comprehensive analysis and planning in a variety of areas when anticipating new site or redevelopment projects. Consider the following when planning or designing a landscape:
 - a) Evaluate physical site characteristics (e.g., soil characteristics, slope issues, and proximity to sensitive areas, etc.).
 - b) Consider how the site will be used and how it will affect neighboring properties.

- c) Identify existing plants for retention or salvage, as appropriate.
 - d) Develop a program theme with stakeholders.
 - e) Identify maintenance impacts.
 - f) Debrief completed project with team.
2. **Drainage.** Healthy plants are easiest to maintain when site and soil conditions are proper for the plants. Drainage patterns, slope, sun exposure, soil type, nutrients present, plant species present, and patterns of use all play a role in determining how plants will grow in a particular location.

Most plants do not grow well in saturated soil. Plants need two types of drainage, surface and sub-surface. First, planting areas need a surface shape that has no low spots where water can puddle and a slight slope so that some water from heavy rains can run off.

Second, plants need a soil profile that is well drained, where water can percolate through to below the root-zone. Properly designed drainage systems can help provide the correct environment for growing healthy plants.

The following are design guidelines to assist in a site drainage plan design:

- a) Ensure the project manager and maintenance supervisors have provided adequate staffing and funding for ongoing maintenance of any drainage plan.
 - b) Minimize alteration of natural drainage patterns around existing vegetation that is to be preserved.
 - c) Conform to natural drainage patterns.
 - d) Provide opportunities for surface runoff of water to replenish the groundwater table.
 - e) Minimize soil erosion by dispersing water flow across the ground surface.
 - f) Reduce water velocity and increase soil permeability with plantings and mulch.
 - g) On steep slopes or areas that are prone to landslides, avoid using plants that require supplemental irrigation.
 - h) Implement erosion control devices as a form of preventative maintenance, e.g., application of compost or other organic soil amendments, slope protective material, protective berms, silt fences.
 - i) Avoid installation of permanent irrigation systems in landslide hazard areas.
3. **Plant Selection.** The successful landscape or grounds maintenance of an area is dependent on the initial plant selection in the design phase. Plant selection should be guided by four criteria:
- **a) Aesthetic and thematic schemes.** Use of indigenous native plantings should be considered first, especially in large areas. The full range of horticultural species and cultivars may be appropriate for high use, high visibility landscapes.
 - **b) Match environmental conditions of the site with the cultural requirements of the plant.** It is essential that the cultural and environmental requirements of the plants be matched with the site conditions. Healthy landscapes are easiest to maintain when site and soil conditions are proper for growing the plants chosen. Drainage, slope, sun, soil texture and structure, nutrient levels in the soil, plant species and cultivars present, and patterns of use all play a role in determining how plants will grow in a particular location.
 - **c) Maintenance impacts.**
 - Pruning. To avoid routine pruning, select plant cultivars based on their size and shape when mature. When specific site issues override pruning concerns and when associated resource impacts are identified, plants requiring frequent pruning may be considered. Plants such as roses and sheared hedges may be appropriate for specialty gardens and selected focal points.
 - Weed management. Plant selection and placement should embrace IPM principles. Vigorous groundcovers, mulches, shade canopies and plant spacing are factors that can reduce the need for weed control. Noxious weed laws and quarantines should be followed. In existing plantings, IPM principles should be applied to weeds and other pests.

- Plant pest management. In new plantings, use species and cultivars that are resistant to insect infestations and plant disease. Only in limited situations (e.g., replacement of ornamental historical plantings) should exceptions occur. It is important to follow IPM principles.
- **d) Environmental Issues.** Environmental issues to be considered in plant selection include:
 - Provide native wildlife habitat whenever possible, such as when adjacent landscapes currently provide habitat.
 - Select plants with water needs appropriate to the site. Limit high-water- use plants to specialty plantings or where the natural water table will support the plants without supplemental irrigation. Group plants with similar water needs together.
 - Avoid plants that will require significant pest management. Select native plants or disease resistant cultivars and avoid insect-prone species.
 - Avoid plant species with invasive growth or seeding habits. See Section 3 (F) for more guidelines on noxious weeds.
 - Prevent surface soil erosion by covering soil with plants or mulch.
 - Select plants with similar horticultural needs for groupings.
 - Avoid the use of commercial wildflower seed mixes. These tend to contain weed seeds and introduce exotic invasive plants and noxious weeds. If a seed mix is used, use only weed-free mixes from reputable local sources.
- **e) Plant Health.** Healthy plants are better at reducing pest infestations and out-competing weeds, and they need less water. The following are guidelines for environmentally responsible maintenance of plant health:
 - a) Plant in the fall, when feasible, to take advantage of fall and winter rains and to reduce the need for supplemental irrigation.
 - b) Prior to planting, assess and monitor soil conditions. Soil tests are the most effective method of determining soil conditions. Monitor regularly and modify practices accordingly. If necessary, amend the soil appropriately; include organic material such as compost.
 - c) When replanting beds or turf areas, mature compost (about 20 percent by volume) should be incorporated to a depth of 8 to 12 inches or, preferably, the full rooting depth of the plants to be installed.
 - d) Base fertilizer applications on soil test and plant requirements. Fertilizer sources should be chosen to minimize leaching and toxicity. Natural organic and synthetic slow-release fertilizers should be considered before soluble fertilizer sources. Avoid applying phosphorus unless a soil test indicates that it is necessary.
 - e) Avoid over-watering plants to conserve water, improve plant health and minimize leaching into surface and ground water. Over-watering is a primary cause of plant disease and demise.
 - f) Determine the seasonal evapotranspiration (ET) rate for the site and use it to estimate the amount of irrigation water needed to replace that lost as ET. During Puget Sound summers the average ET is about one inch of water per week (somewhat less than one inch in May, June, and September, and somewhat more than one inch in July and August).
 - g) Use weed-free compost, gravel and mulch materials.
- **f) Mulch.** Use of organic material as a soil topping improves soil conditions in the following ways:
 - a) helps reduce evaporation,
 - b) improves water infiltration,
 - c) reduces run-off and erosion,

- d) enriches soil fertility and texture,
- e) immobilizes or degrades pollutants,
- f) inhibits the growth of competing, nutrient-absorbing weeds. The following are guidelines for using mulch in plantings:
- g) Do not apply mulches where they may migrate or leach nutrients or tannins into waterways.
- h) Maintaining a 2-inch minimum layer of mulch in planted areas is recommended.
- i) A mulchless zone around the base of tree trunks is recommended to discourage root-rotting fungi.
- j) Wood chips should be used whenever appropriate. On-site chipping simplifies the maintenance process by providing chips that are effective, free, readily available, and have a natural look. In addition, using wood chips generated on-site for mulch reduces the need to haul green-wastes, thereby saving energy. It should be noted that, where wood chips are used for mulch, nitrogen might need to be added (5 pounds/1000 square feet).
- k) Other acceptable materials include compost, shredded bark, Steerco, Groco, or Nutra Mulch.
- l) When purchasing mulch materials, specify that they should be "weed- and disease-free."
- m) Unless disease problems are present, allow leaf litter to accumulate upon the soil within planted areas that are not intended to have a manicured appearance.
- n) Prevent weed infestations by covering mulch, soil and compost piles with plastic tarps, as needed.
- **g) Automatic Irrigation Systems.** Efficient use of irrigation water conserves water and reduces runoff. Irrigation of landscapes is one of the most publicly visible landscaping activities, reinforcing the need for effective water management by public entities. Agencies should seek the advice of their local water purveyor for conservation planning.

The following guidelines will assist in conserving water for landscape maintenance:

- a) Identify site irrigation needs based on use, plant needs, soil permeability, and topography.
- b) Use water efficiently.
 - * To achieve maximum efficiency, perform system maintenance and repairs. Check and repair all problems at system turn-on in the spring.
 - * Inspect backflow preventers annually, consistent with state law.
 - * Conduct a complete system audit during design and when major changes occur to the system.
 - * Once an effective schedule is established, it should be monitored bi-weekly to avoid "brown outs."
 - * Avoid irrigating in the heat of the day.
- c. Conserve water.
 - * Reclaimed water is desirable where it is available to promote the conservation of limited potable water
 - * Cut back on irrigation as weather indicates. Use historic evapotranspiration data for your area.
 - * Reduce irrigation incrementally in late summer.

- * Many planting areas can be irrigated less as the plants mature and become established. Plantings designed with native or drought tolerant species should gradually be weaned from all irrigation on a 3 to 5 year schedule.
- d. Create a permanent irrigation record system that documents where, when and how much water was used to "fine tune" a system, rather than recreate it each year.

D. Lawns and Turf.

Lawns and turf areas are an important subset of developed landscapes that demand specific attention regarding IPM implementation. Lawns are used for a variety of purposes. Lawn maintenance can significantly affect the environment in a negative way if not carried out with attention to proper environmental practices. The intended use of a lawn or turf area will determine many of the maintenance specifics. Healthy lawns can resist disease, pests and drought damage and can out-compete most weeds without reliance on chemicals. Properly maintained lawns also require less supplemental irrigation.

The following guidelines will assist in maintaining lawns and turf areas in an environmentally responsible manner:

1. Assess the condition of the lawn or turf. Look for turf density, turf species present, percent weed cover, and color. Healthy lawns in the Puget Sound region are a medium green color.
2. Determine previous maintenance schedule and assess effectiveness. Consider whether acceptable results can be achieved at lower maintenance levels or significant improvements can be realized through minor program adjustments. The following areas should be addressed:
 - a) soil testing and results
 - b) mowing and edging
 - c) irrigating
 - d) fertilizing
 - e) hand weeding
 - f) pesticide application
 - g) aerating
 - h) de-thatching
 - i) overseeding
 - j) drainage
3. Develop maintenance standards and threshold levels for categories of use and types of turf. For example, low use, low visibility turf areas have higher weed and pest thresholds than heavily used and high visibility lawns do. Develop maintenance schedules that reflect the assessment for each of the elements of 2 above. Use the following maintenance practices for high use turf areas:
 - a) In general, mow high, mow often, and leave the clippings. Mow at correct mowing height for the grass species in the turf. Mow at least weekly in spring.
 - b) Fertilize lightly in the early fall and late spring with a natural organic or slow-release fertilizer.
 - c) Water deeply to moisten the root zone, but water infrequently. Lawns newly planted in spring, however, need frequent watering.
 - d) Avoid using quick-release fertilizers and weed-and-feed formulations. Avoid or minimize the use of pesticides.
 - e) Follow buffer recommendations contained in the Waterways section (3.A) where lawns abut streams, lakes or other waterways.
 - f) Annually aerate lawns in the spring or fall to improve root development; high-use turf should ideally be aerated two to three times a year.
 - g) Consider purchasing electric mulching mowers, when new machines are needed.

Some lawns are non-irrigated or minimally irrigated and brown out in the summer. Where it is possible, irrigate deeply once each summer month; this will help keep the crowns of the

desired grasses alive. Continue mowing throughout the summer months to reduce the quantity of weed seeds produced. Turf that is heavily used should be irrigated, if possible, to avoid serious degradation. Improving cultural practices such as fertilizing, overseeding, and aerating can make a lawn more drought resistant.

E. Natural/Open Spaces.

Natural or open space lands should be managed under the following general guidelines:

1. Conserve wildlife habitat and foster native species. This may include restoring degraded natural areas to increase their habitat and educational values.
2. Maintain, enhance and restore vegetation for its ecological and wildlife habitat value and visual benefits.
3. Emphasize the use of drought tolerant plants and native vegetation in site development and restoration to minimize the need for irrigation and reduce damage caused by non- native species.
4. Use proper plant selection with regard to natural site moisture conditions.
5. Work with other agencies to maintain the necessary quality and quantity of water in streams and lakes to provide for plant communities, suitable fish and wildlife habitat and recreational use.
6. Develop and apply environmentally sensitive maintenance techniques and best management practices as responsible stewards and caretakers of the system.

F. Noxious Weeds.

Noxious weeds, as defined by Chapter 17.10 RCW, are non-native plants that are highly destructive, competitive or difficult to control. They have been introduced accidentally or as ornamentals, can impact or destroy native plant and animal habitat, reduce crop yields, poison humans and livestock, clog waterways, reduce recreational opportunities and lower land values. A state noxious weed list is adopted annually in WAC Chapter 16-750. State law requires both private and public landowners to eradicate certain plants, prevent seed production and prevent the spread of state listed noxious weeds. Failure to comply with the state weed control law can result in an enforcement action or civil infraction.

Noxious weeds are designated in several classes. Class A weeds have a limited distribution in Washington. Control and eventual eradication of these species is required in all of Washington State. Class B weeds are currently limited to portions of Washington. Class B weed lists will differ from county to county based on the weeds' distribution and each county weed board's policy.

Control of certain Class B weeds may be required. Class C weeds are common throughout Washington. Counties can select priority weeds off the Class C list for mandatory control. Contact your county weed board for a full noxious weed list for your county.

The state noxious weed list is updated annually. The county weed control boards also adopt a weed list annually. The King County 1999 Noxious Weed List is available on the web at <http://splash.metrokc.gov/wlr/LANDS/weeds.htm>.

Contact the county noxious weed control program for educational and technical assistance on identifying, controlling, and preventing noxious weed infestations:

- King County: 206-296-0290
- Pierce County: 253-798-7263
- Snohomish County: 425-338-2400

Follow Integrated Pest Management techniques when dealing with noxious weeds:

- a) Prevent noxious weed problems; learn how to identify noxious weeds, learn strategies for controlling or eliminating them.
- b) Monitor for the presence of noxious weeds and weed damage.

- c) Treat noxious weed problems to reduce populations using strategies that may include biological, cultural, mechanical, and chemical control methods - always consider human health, ecological impact, feasibility, and cost-effectiveness.
- d) Minimize the use of chemical pesticides by using alternative control methods and by using chemical controls correctly.
- e) Evaluate the effects and efficacy of noxious weed control treatments. The methods of control include pulling, repeated mowing, digging to eliminate all roots and rhizomes, cutting and bagging to remove seeds, use of landscape fabric, replanting with appropriate species, and in some cases herbicide applications. It is usually necessary to constantly check the site for newly emerging seedlings and plants missed in previous control efforts.

Additional guidelines regarding noxious weeds include:

- a) Learn to recognize and eliminate noxious and invasive weeds before they establish.
- b) Choose non-invasive species for landscapes and gardens.
- c) Prevent noxious weed infestations by checking vehicles, clothing and equipment for weeds and seeds.
- d) Remove or control weeds safely and appropriately. The most important step is to control seed production by cutting down and bagging noxious plants.
- e) Protect yourself when working with noxious weeds; some, such as hogweed and leafy spurge, contain toxins that can damage skin on contact.
- f) Replant with appropriate species to prevent weeds from returning.
- g) Dispose of noxious weeds and weed seeds properly. Consult with the county program (contacts above) for specific recommendations. Do not compost any noxious weed debris that may contain seeds or plant parts that might take root.
- h) In cases where noxious weeds may impact habitat (aquatic or terrestrial), control measures may need to be taken to restore the habitat functions.

Some of the more common noxious weeds found in this region are:

- a) Giant hogweed - predominantly an urban weed and an escaped garden ornamental, its sap can cause skin blistering and scarring. Washington State law requires that giant hogweed be eradicated.
- b) Tansy ragwort - likely to infest pastures and roadsides, it has toxins that can be fatal to cows and horses and can be found in milk and honey.
- c) Spotted and diffuse knapweeds - threaten wildlife habitat, pastures, and grasslands by displacing beneficial species.
- d) Purple loosestrife - grows in wetlands and along lakes, rivers and streams; it chokes out wildlife habitat and clogs drainage ditches and irrigation canals. Purple loosestrife now invades wetlands in numerous states at an estimated cost of \$45 million a year for control and loss of forage crops, crowding out native plants and endangering the wildlife that depend on the native plants.
- e) Hydrilla - the most problematic aquatic plant in the U.S., it forms extensive surface mats that destroy freshwater fish habitat and recreation areas. Washington State law requires that hydrilla be eradicated.
- f) Parrotfeather - chokes out prime salmon habitat and reduces availability of refuge, exposing salmon to predators.

G. Electrical Facilities.

1. Substation Gravels.

Electrical substations, switchyards, and other installations housing electrical equipment typically have a 6-12" gravel surface as an insulative barrier above a subsurface electrical grounding mat. The gravel protects workers from voltage differences and high electrical currents that can occur during electrical fault episodes. Weeds growing in electrical substation gravel compromise the gravel's ability to insulate workers from the ground mat, which increases the risk of electrical hazards.

The following guidelines will assist in maintaining electrical substations in an environmentally responsible manner that is protective of worker safety:

- a) Utility electrical engineers should evaluate the potential electrical effect of vegetation inside substations depending on the type of substation or electrical installation. Develop maintenance standards which define the level of weed management necessary for safety. For example, receiving substations, cable terminuses and switchyards which pose the greatest electrical hazards may have a zero tolerance for vegetation and need to be maintained weed-free. Other installations which pose lesser risk, such as 4 kV stations and enclosed industrial transformers, may require less rigorous weed control, e.g. to avoid trip hazards or impeding work inside a confined area.
- b) Use Integrated Pest Management strategies to control weed growth over the short-term, including:
 - burning weeds with flame or steam,
 - mechanical removal,
 - selective use of pre- and post-emergent herbicides.
- c) When feasible, use long-term solutions such as:
 - Replacing gravel more frequently.
- Designing new substations, or renovating existing installations, with electrical ground mat/insulating systems which prevent weed growth or preclude need for rigorous weed control.

2. Electrical Transmission Rights-of-Way

As a matter of public safety and system reliability, electric utility rights-of-way (R.O.W.) have a continuing need to preclude the establishment and subsequent growth of vegetation into and close to overhead electric lines. The situations on the electric utility rights-of-way that necessitate vegetation management are: 1) tall-growing trees below the overhead electric lines that will grow upwards into the conductors (electric lines); 2) tall-growing "danger trees" encroaching from the R.O.W.'s edge that may fall into the conductors; 3) vegetation blocking access to the transmission system; 4) noxious weeds; and 5) aesthetic improvement of R.O.W.s

The following guidelines utilize an IPM approach to R.O.W. maintenance which provides a safe and environmentally sound program:

- a) Emphasize proper selection and placement of trees on the R.O.W.
- b) Improve streamside management techniques (erosion control, riparian habitat enhancement, improve fish passage).
- c) Encourage low-growing native species.
- d) Use beneficial insects to control noxious weeds.
- e) Use manual or mechanical vegetation removal methods.
- f) Selectively use herbicide for cut stump treatment, applied only to tall growing tree species to reduce resurgent tree growth problem.

H. Pesticide Handling.

When a decision is made to use a pesticide as part of a specific IPM strategy, precautions should be followed for storage, mixing, loading, application, cleaning and disposal, to ensure public health and safety as well as environmental protection.

1. Storage: Storage areas should be carefully surveyed. Spills are very likely where containers are handled. Good storage practices include:
 - a) Provide secondary containment. Store pesticides in an area that will keep any spilled material in a bermed or enclosed area with a concrete floor and no drain until clean-up can occur. High-sided plastic containers offer at least interim protection, depending on the product being stored.
 - b) Store pesticides in their original containers.
 - c) Keep pesticides out of the reach of children, pets, and livestock.
 - d) Store liquids on the bottom shelf.

- e) Do not store bagged material below liquids.
 - f) Separate insecticides, herbicides, etc.
 - g) Inspect containers periodically for leaks and spills.
 - h) Determine whether stored products can withstand freezing and store appropriately.
 - i) Rotate stock; use the oldest first.
 - j) Provide adequate ventilation.
 - k) Store Personal Protective Equipment in a separate location.
2. Mixing and loading: Pesticides can be spilled during mixing and loading. If spilled on the ground, they can eventually contaminate groundwater. If spilled on a paved area, they can eventually wash into floor or storm drains. This should be avoided.
- a) Read the label thoroughly before mixing and follow all directions carefully. Handle pesticide concentrates carefully to avoid accidental spills and personal harm.
 - b) Because the applicator is handling concentrated product, this is the most dangerous phase of pesticide use. Be sure to wear all Personal Protective Equipment (PPE) required by the label.
 - c) Measure accurately. It is illegal to mix pesticides at rates higher than those listed on the label.
 - d) Calculate the area to be treated and the amount of material needed carefully. Calibrate equipment accurately. Mix only the amount needed.
 - e) Avoid contaminating water supplies by avoiding back-siphoning while adding water to tanks.
 - f) Triple rinse containers immediately upon emptying. Pour rinsate into application tank to use in subsequent treatments. Make sure containers are appropriately marked or labeled.
3. Application: When mixing and applying pesticides, all label precautions must be followed. It is a violation of federal and state laws to disregard label directions.
- a) Spot treat only the area or pest where the problem occurs, following the selected IPM strategy. Avoid broadcast application.
 - b) Follow label directions for PPE and for weather and other conditions appropriate for treatment. Do not spray or otherwise treat if it is too windy (> 5 mph) or too wet. The pesticide should reach only the intended target.
 - c) If pesticide is spilled on skin or clothing, remove clothing and wash skin thoroughly.
 - d) Leave no-spray buffer strips near surface waters. See Section 3 (A) for specific guidelines.
 - e) Be prepared for spills. Have clean-up materials available for immediate use.
 - f) Keep people and animals off of sprayed areas as noted in the label directions.
 - g) Post appropriate signage at applied areas, following WSDA regulations.
4. Cleaning: Cleaning of pesticide application tools presents another significant opportunity for spills or other contamination incidents. Caution should be exercised.
- a) Clean equipment after each use unless it will be used for the same chemical the next time.
 - b) Rinse equipment thoroughly - triple rinsing is the standard. Rinsate should be saved for use in the next application. If rinsate is used in further applications, it must be applied according to label directions and the selected IPM strategy.
5. Disposal: Containers, equipment and unused, surplus or waste pesticide product must be disposed of in ways protective of public safety and the environment.
- a) Properly dispose of empty containers. Triple-rinsed plastic containers should be recycled through the Plastic Pesticide Container Collection Program run by Washington Pest Consultants Association (509-457-3850). Thoroughly emptied bags

and triple-rinsed liquid containers that cannot be recycled can usually be disposed of at a solid waste facility; follow label directions and advice of the appropriate solid waste characterization or screening program (King County: 206-296-4633; Pierce County: 253-798-6047; Snohomish County:).

- b) Rotate stock of chemicals so the oldest is used first; thus reducing the need to dispose of outdated chemicals.
- c) Some pesticides are ineffective if stored at freezing temperatures; read the labels and store appropriately to avoid having to dispose of frozen products.
- d) Surplus pesticide which is still usable and which would meet the conditions of a jurisdiction's IPM program (i.e., not banned or restricted, and not surplus because it is found to be too hazardous, toxic, mobile or other detrimental reason) may be referred to the Industrial Materials Exchange ("IMEX" at 206- 296-4899) to find an appropriate user.
- e) Unusable, waste pesticide must be disposed legally, usually as a hazardous waste. Follow all applicable laws and regulations, using a licensed hauler and permitted treatment, storage and disposal facility if required. The Washington State Department of Agriculture offers a Pesticide Waste Disposal Program where a public jurisdiction's unusable pesticides might be able to be disposed at no cost. Regional events are held around the state as funding allows. There is no charge to participate in these disposal events. Contact WSDA at 360-902-2056 for more information or to pre-register for an event.

Appendix B 1999 Tier Tables 1, 2, 3

Tier Tables 1, 2 and 3

http://www.pesticideinfo.org/Search_Products.jsp											
More Info = Hyperlink to Internet											
Registered Product Name	Tier #		EPA Reg #	EPA reg# Product Status	Acute Hazard Warning Label	PAN Bad Actor	EPA Restricted Use Status	Toxicity LD50 Fish	Toxicity LD50 Bees	Other	Mfg. Name
Tier 1											
Targeted Products to Phase Out											
Arsenal 75 sg herbicide	1	More Info	241-387	Active	Caution	Yes	No	ST	Mild	Moderate Acute Toxic, Potential Groundwater Contaminant	BASF Corporation
Arsenal Technical	1	More Info	241-286	Active	Danger	Yes	No	ST	Mild	Moderate Acute Toxic, Potential Groundwater Contaminant	BASF Corporation
Banvel / Dicamba 4#	1	More Info	66330-287	Active	Danger	Yes	No	nat	ess non	Potential Groundwater Contaminant, Possible Carcinogen, Developmental-Reproductive Toxin, Suspected Endo Disruptor	Arysta lifescience
Banvel +Atrazine	1	More Info	66330-286	Active	Caution	Yes	Yes	ST	Mild	Slight Acute Toxic, Groundwater Contaminant, Carcinogen, Developmental-Reproductive Toxin, Suspected Endo Disruptor	Arysta lifescience
BAS 452	1	More Info	7969-133	Active	Danger	Yes	No	nat	ess non	Potential Groundwater Contaminant, Possible Carcinogen, Developmental-Reproductive Toxin, Suspected Endo Disruptor	BASF Corporation
Bifen	1	More Info	53883-118	Active	Caution	Yes	No	AT	High	Moderate Acute Toxic, Possible Carcinogen, Developmental-Reproductive Toxin, Suspected Endo Disruptor	Control solutions, Inc.
Hardball	1	More Info	5905-549	Active	Danger	Yes	Yes	nat	ess non	Moderate Acute Toxic, Potential Groundwater Contaminant, Possible Carcinogen, Suspected Endo Disruptor	Helena chemical co
Krenite S	1	More Info	42750-247	Active	Caution	Yes	No	nat	ess non	Cholinesterase Inhibitor	Du Pont

Speed Zone Broadleaf (aka 1381 ec resential)	1	More Info	2217-864	Active	Caution	Yes	No	MT		Mild	Moderate Acute Toxicity, Potential Groundwater Contaminant, Possible Carcinogen, Developmental- Reproductive Toxin, Suspected Endo Disruptor	Pbi/gordon corp
Talstar	1	More Info	279-3168	Active	Caution	Yes	No	AT		High	Moderate Acute Toxicity, Possible Carcinogen, Developmental- Reproductive Toxin, Suspected Endo Disruptor	Fmc corp.
Conditional Use												
Arsenal herbicide	1	More Info	241-273	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	BASF Corporation
Arsenal herbicide	1	More Info	241-346	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	BASF Corporation
Arsenal Concentrate	1	More Info	241-299	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	BASF Corporation
Arsenal mup	1	More Info	241-336	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	BASF Corporation
Arsenal Powerline	1	More Info	241-431	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	BASF Corporation
Capstone / Milestone VM Plus / Radar	1	More Info	62719-572	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Dow Agrosiences
Casoron 4g	1	More Info	400-168	Active	Caution	Not Listed	No	MT		ess non	Slight Acute Toxic, Potential Groundwater Contaminant, Possible Carcinogen	Chemtura corporation
Chaparral	1	More Info	62719-597	Active	Warning	Not Listed	No	nat		Mild	Slight Acute Toxic, Potential Groundwater Contaminant	Dow Agrosiences
Chaser Turf	1	More Info	34704-928	Active	Caution	Not Listed	No	MT		Mild	Potential Groundwater Contaminant, Possible Carcinogen, Suspected Endo Disruptor	Loveland products, Inc.
Chaser 2 amine	1	More Info	34704-930	Active	Danger	Yes	Yes	ST		No Data	Potential Groundwater Contaminant, Possible Carcinogen, Suspected Endo Disruptor	Loveland products, Inc.
Cimarron X-tra	1	More Info	432-1562	Active	Caution	Yes	No	nat		Mild	Slight Acute Toxic, Potential Groundwater Contaminant, Developmental- Reproductive Toxin	Du Pont
Crossbow	1	More info	62719-260	Active	Caution	Not Listed	No	MT		Mild	Potential Groundwater Contaminant, Possible Carcinogen, Suspected Endo Disruptor	Dow Agrosiences, LLC
Element 3A / Garlon 3A / Renovate 3	1	More Info	62719-37	Active	Danger	Yes	No	nat		No Data	Potential Groundwater Contaminant	Dow Agrosiences, LLC
EZject (Copperhead) Imazapyr	1	More Info	83220-2	Active	Caution	Not Listed	No	nat		No Data	Potential Groundwater Contaminant	Ez-ject, Inc.
Escort XP	1	More Info	432-1549	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	Du Pont

Evade 4FL	1	More Info	34704-915	Active	Caution	Not Listed	No	ST		Mild	Possible Carcinogen, Suspected Endo Disruptor	Loveland products, Inc.
Habitat	1	More Info	241-426	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	BASF Corporation
Metcel VMF	1	More Info	85588-6	Active	Caution	Not Listed	No	nat		Mild	Potential Groundwater Contaminant	Agsurf corporation
Milestone	1	More Info	62719-519	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Dow Agrosiences
Milestone VM	1	More Info	62719-537	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Dow Agrosiences
Milestone VM Plus / Capstone / Radar	1	More Info	62719-572	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Dow Agrosiences
Opensight	1	More Info	62719-617	Active	Warning	Not Listed	No	nat		Mild	Potential Groundwater Contaminant	Dow Agrosiences
Oust Extra	1	More Info	432-1557	Active	Caution	Not Listed	No	MT		Mild	Potential Groundwater Contaminant	Du Pont
Payload / Sureguard	1	More Info	59639-120	Active	Caution	Not Listed	No	nat		ess non		Valent u.s.a. corporation
Perspective	1	More Info	432-1569	Active	Caution	Not Listed	No	MT		No Data		Bayer environmental science
Polaris	1	More Info	228-534	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Nufarm americas Inc.
Polaris AC	1	More Info	228-570	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Nufarm americas Inc.
Polaris AQ	1	More Info	241-426	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Nufarm americas Inc.
Radar / Capstone / Milestone VM Plus	1	More Info	62719-572	Active	Caution	Not Listed	No	nat		ess non	Potential Groundwater Contaminant	Dow Agrosiences
Renovate 3 / Element 3A / Garlon 3A	1	More Info	62719-37	Active	Danger	Yes	No	nat		ess non	Potential Groundwater Contaminant	Dow Agrosiences
Stinger	1	More Info	62719-73	Active	Caution	Not Listed	No	MT		Mild	Potential Groundwater Contaminant	Dow Agrosiences
Suppress	1	More Info	51517-9	Active	Warning	Not Listed	No	ST		No Data		Westbridge Agricultural Products
Sureguard / Payload	1	More Info	59639-120	Active	Caution	Not Listed	No	nat		ess non		Valent u.s.a. corporation
Surflan AS	1	More Info	70506-44	Active	Caution	Yes	No	MT		ess non	Potential Groundwater Contaminant, Carcinogen, Suspected Endo Disruptor	United phosphorus, Inc.
Surflan XL 2g	1	More Info	70506-45	Active	Caution	Yes	No	AT		Mild	Potential Groundwater Contaminant, Carcinogen, Suspected Endo Disruptor	United phosphorus, Inc.
Tahoe 3A	1	More Info	228-520	Active	Danger	Yes	No	nat		No Data	Potential Groundwater Contaminant	Nufarm americas Inc.
Telar XP	1	More Info	432-1561	Active	Caution	Yes	No	nat		Mild	Potential Groundwater Contaminant, Developmental- Reproductive Toxin,	Du Pont
Turflon II Amine	1	More Info	228-316	Active	Danger	Yes	No	nat		ess non	Potential Groundwater Contaminant, Possible Carcinogen, Developmental- Reproductive Toxin, Suspected Endo Disruptor	Nufarm americas Inc.

Vaquero	1	More Info	2935-559	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant, Product contains chemical(s) known to the State of California to cause cancer and birth defects or other reproductive harm.	
WeeDestroy AM-40	1	More Info	228-145	Active	Danger	Yes	No	nat		ess non	Potential Groundwater Contaminant, Possible Carcinogen, Suspected Endo Disruptor	Nufarm americas Inc.
WeedMaster / KambaMaster	1	More Info	71368-34	Active	Danger	Yes	No	ST		Mild	Slight Acute Toxicity, Potential Groundwater Contaminant, Possible Carcinogen, Developmental-Reproductive Toxin	Nufarm americas Inc.
Tier 2												
*Consider as Tier 1 during next Tier Table update												
Element 4 / Garlon 4	2	More Info	62719-40	Active	Caution	Not Listed	No	MT		Mild	Potential Groundwater Contaminant	Dow Agrosiences
Gallery 75DF	2	More Info	62719-145	Active	Caution	Not Listed	No	MT		ess non	Slight Acute Toxic, Potential Water Contaminant, Possible Carcinogen	Dow Agrosiences
Garlon 4 Ultra	2	More Info	62719-527	Active	Warning	Not Listed	No	MT		Mild		Dow agrosiences
Oust XP	2	More Info	432-1552	Active	Caution	Not Listed	No	ST		ess non	Potential Groundwater Contaminant	Du Pont
Poast	2	More Info	7969-58	Active	Warning	Not Listed	No	ST		Mod		BASF Corporation
Primo Maxx	2	More Info	100-937	Active	Caution	Not Listed	No	ST		Mild	Potential Groundwater Contaminant	Syngenta crop protection
Scythe	2	More Info	10163-325	Active	Warning	Not Listed	No	ST		Mild		Gowan Company
Approved Use												
Accord Concentrate / AquaPro /Durango / Glypro / Rodeo	2	More Info	62719-324	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Dow Agrosiences
Accord XL / Ranger Pro	2	More Info	524-517	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Aquamaster / Roundup Custom	2	More Info	524-343	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Aquaneat	2	More Info	228-365	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Nufarm
Clearcast	2	More Info	241-437	Active	Caution	Not Listed	No	nat		Mild		BASF Corporation
Esplanade200sc	2	More Info	432-1516	Active	Caution	Not Listed	No	nat		No Data		Bayer environmental
EZject (Diamondback) - (aka Glyphosate Capsules)	2	More Info	83220-1	Active	Caution	Not Listed	No	ST		ess non	Glyphosate	Ez-ject, Inc.
Fiesta (aka Neu1173h concentrate)	2	More Info	67702-26	Active	Caution	Not Listed	No	nat		No Data		W. neudorff gmbh kg
Glyphosate residual rtu	2	More Info	241-425	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	BASF Corporation
Quik-Fire	2	More Info	67702-8-17545	Active	Warning	Not Listed	No	nat		Mild		W. neudorff gmbh kg
Ranger Pro / Accord XL	2	More Info	524-517	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Razor	2	More Info	228-366	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Nufarm
Roundup	2	More Info	524-445	Active	Warning	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup 1 Ready-to-Use	2	More Info	71995-23	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Concentrate	2	More Info	71995-26	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Concentrate Plus	2	More Info	71995-29	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Conc. Poison Ivy & Tough Brush	2	More Info	71995-20	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto

Roundup Custom / Aquamaster	2	More Info	524-343	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup d-pak	2	More Info	524-494	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup dry concentrate	2	More Info	71995-22	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Fence & Yard Edger 1	2	More Info	71995-11	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Grass and Weed Killer	2	More Info	71995-10	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup L & G Concentrate	2	More Info	524-370	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup L & G Ready-to-Use	2	More Info	71995-8	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Max / ProMax	2	More Info	524-579	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Original 2k	2	More Info	524-539	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Original II	2	More Info	524-454	Active	Warning	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Power Max (Rd1617)	2	More Info	524-549	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Pro Concentrate	2	More Info	524-529	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup ProDry	2	More Info	524-505	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Quik Stik	2	More Info	71995-9	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Rainfast Concentrate	2	More Info	71995-17	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Rainfast Super Concentrate	2	More Info	71995-18	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ready-to-Use 1	2	More Info	71995-12	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ready-to-Use 2	2	More Info	71995-13	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ready-to-Use Extended 1+	2	More Info	71995-21	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ready-to-Use Plus	2	More Info	71995-36	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Super Concentrate	2	More Info	71995-25	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ultra	2	More Info	524-475	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ultra Dry	2	More Info	524-504	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup Ultra Max	2	More Info	524-512	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup VM	2	More Info	524-544	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Roundup WSD	2	More Info	524-502	Active	Caution	Not Listed	No	ST		Mild	Glyphosate	Monsanto
Tier 3												
Vectolex cg ... bT Insecticide	3	More Info	73049-20	Active	Caution	Not Listed	No	nat		n.d.		Valent biosciences corp

Appendix C Summary of Tier Table 1 Products Used by Agency 2014-2018

Summary of Tier Table 1 Products Used by Agency 2014-2018

* >100 ug/bee is essentially non-toxic

Active Ingredients	Product Name	EPA Registration #	LD50 – Bee Toxicity	Dept/Div.	2018	2017	2016	2015	2014	Total (gallons)	Total (pounds)
2,4-D, butoxyethyl ester			1.5 ug/bee							0.80	-
	Chaser Turf	34704-928		WLRD	3.30	99.00	-	-	-		
2,4-Dichlorophenoxyacetic Acid			1.5 ug/bee							1.15	-
	Hardball	5905-549		WLRD	-	-	101.00	46.00	-		
2,4-Dichlorophenoxyacetic Acid / Triclopyr			1.5 ug/bee							4.73	-
	Chaser 2 Amine	34704-930		WLRD	180.70	147.00	277.30	-	-		
2,4-Dichlorophenoxyacetic Acid / BEE / Triclopyr			1.5 ug/bee							2.96	-
	Crossbow	62719-260		Airport	8.00	-	-	-	-		
				Solid Waste	-	144.00	-	192.00	-		
				WLRD	3.50	31.00	-	-	-		
2,4-D Dimethyl Amine Salt / Mecoprop			>100 ug/bee							0.27	-
	Weed-B-Gon	239-2664		WLRD	-	35.00	-	-	-		
2,4-D, Dimethylamine salt			>64 ug/bee							3.63	-
	Turflon II Amine	228-316		WLRD	-	-	-	331.00	134.00		
Aminocyclopyrachlor / Chlorsulfuron			>25 ug/bee							1.71	-
	Perspective	432-1569		Parks	172.80	-	-	-	-		
				WLRD	1.50	45.00	-	-	-		
Aminopyralid Triisopropanolamine Salt			>100 ug/bee							33.94	-
	Milestone	62719-519		Parks	12.77	0.49	172.30	39.85	91.75		
				Roads	-	-	-	26.00	-		
				Solid Waste	-	324.00	-	32.00	-		
				WLRD	130.10	-	50.03	44.00	23.00		
	Milestone VM/VP	62719-537		Roads	645.00	112.00	1,265.60	-	1,346.00		
				WLRD	-	30.00	-	-	-		

Aminopyralid, Metsulfuron Methyl			>25 ug/bee							-	0.40
	Opensight	62719-597		WLRD	0	0	0	0.40 lbs	0		
Caprylic Acid / Capric Acid			No Data							1.35	-
	Suppress	51517-9		Parks	173.00	-	-	-	-		
Clethodim			>64 ug/bee							1.42	-
	Vaquero	2935-559		Parks	182.00	-	-	-	-		
Dichlobenil			>100 ug/bee							-	25.00
	Casoron	400-168		Roads	0	25.00 lbs	0	0	0		
Dimethylamine Salt of 2,4-Dichlorophenoxyacetic Acid			>100 ug/bee							285.48	-
	WeeDestroy AM-40	228-145		WLRD	6.20	214.30	-	-	36,321.00		
Isopropylamine salt of Imazapyr			>100 ug/bee							178.32	-
	Arsenal	241-346		Roads	300.00	128.00	400.00	67.00	147.00		
	EZJect (Copperhead) Imazapyr	83220-2		Parks	104.99	122.51	57.50	34.82	147.60		
				WLRD	29.00	30.90	11.00	27.00	-		
	Habitat / Polaris AQ	241-426		WLRD	-	-	-	4.00	2,705.00		
	Polaris	228-534		Parks	610.36	579.25	1,235.04	3,600.85	5,766.50		
				Solid Waste	48.00	96.00	32.00	64.00	64.00		
				WLRD	367.90	214.30	818.88	4,829.00	182.00		
Metsulfuron methyl			>25 ug/bee							-	44.70
	Escort XP / Metcel VMF	352-439		Roads	6.10 lbs	9.63 lbs	10.00 lbs	7.10 lbs	11.80 lbs		
				WLRD	0	0	0	.07 lbs	0		
Metsulfuron Methyl / Chlorsulfuron			>25 ug/bee							-	0.05
	Cimarron X-tra	352-669		WLRD	0	0	0	0.05 lbs	0		
Oryzalin			>100 ug/bee								
	Surflan AS	62719-113		Airport	-	-	172.00	132.00	40.00	9.81	501.00

	Surflan	70506-44		Parks	-	-	-	-	912.00			
	Surflan XL	70506-45-38167		Parks	123.00 lbs	0	0	0	0			
				WTD	43.00 lbs	0	215.00 lbs	120.00 lbs	0			
Prodiamine												
	Evade 4FL	34704-915	>100 ug/bee	Roads	-	4,352.00	-	5,991.20	-		80.81	-
Triclopyr Triethylamine Salt												
	Capstone / Milestone VM Plus	62719-572	>100 ug/bee	WLRD	0.04	-	-	-	-		490.30	-
	Element 3A / Garlon 3A / Renovate 3	62719-37		Parks	15.00	1,204.92	5,237.36	16,105.35	10,881.40			
				Roads	1,628.00	1,088.00	2,198.30	3,397.30	2,345.00			
				Solid Waste	64.00	64.00	72.00	276.00	510.00			
				WLRD	1,596.20	1,612.50	1,270.09	1,509.00	3,899.20			
				WTD	263.00	182.00	25.03	37.25	158.00			
	Transline	62719-259		WLRD	1.80	-	-	-	-			
	Vastlan	62719-687		Parks	3,399.07	3,320.85	-	-	-			
				WLRD	285.20	112.00	-	-	-			
											1,096.68	571.15
				Total (gallons)	79.93	111.63	104.65	287.39	513.07		1,096.68	
				Total (lbs)	172.10	34.63	225.00	127.62	11.80			571.15

Appendix D Summary of Tier Table 2 Products Used by Agency 2014-2018

Summary of Tier Table 2 Products Used by Agency 2014-2018

* >100 ug/bee is essentially non-toxic

Active Ingredients	Product Name	EPA Registration #	LD ₅₀ – Bee Toxicity	Dept/Div.	2018	2017	2016	2015	2014	Total (gallons)	Total (pounds)
Ammoniated salts of fatty acids			>25 ug/bee							2.50	-
	Quik-Fire	67702-8		WTD	-	-	-	-	320.00		
Ferric HEDTA			>83 ug/bee							3.59	-
	Fiesta	67702-26		Parks	-	-	-	140.00	320.00		
Glyphosate - various formulations			>100 ug/bee							1,188.76	-
	Aquamaster	524-343		WLRD	53.50	168.00	94.31	223.00	1,393.10		
				WTD	205.00	-	-	571.00	-		
				Parks	5,148.20	1,992.00	2,603.31	5,995.00	333.00		
	Aquaneat	228-365		Roads	-	19.20	113.20	99.90	2,831.00		
				WLRD	184.60	76.00	67.85	2,856.00	2,026.70		
				Parks	578.04	711.14	-	-	-		
	Diamondback EZJect	83220-1		WLRD	-	2.65	9.00	0.40	0.40		
				Parks	0.63	65.00	-	-	31.88		
	Ranger Pro	524-517		Roads	7,927.00	8,576.00	11,923.80	10,032.00	13,283.00		
				WLRD	-	-	-	-	99.75		
				Parks	-	-	-	-	91.00		
	Razor Pro	228-366		Roads	-	-	-	33.30	-		
	Rodeo	327-193		WTD	373.00	412.00	1,056.00	-	-		
	Rodeo	62719-324		WTD	168.00	-	-	-	1,033.00		
	Roundup Quick Pro	524-535		Airport	4.00	-	-	-	-		
	Roundup Original	524-445		WLRD	7.10	0.04	-	-	-		
	Roundup Custom	524-343		WLRD	-	-	76.00	-	-		
	Roundup Custom	525-343		WLRD	130.50	202.60	48.00	92.50	6.00		
				Parks	-	-	-	13.75	-		
	Roundup Pro	524-475		Airport	-	-	-	109.50	-		

				WLRD	-	39.00	97.31	5.00	-		
	Roundup ProDry	524-505		Airport	-	-	210.00	-	60.00		
	Roundup Pro Concentrate	524-529		Transit	640.00	768.00	3,584.00	7,620.00	2,560.00		
	Roundup OriginalMax	524-539		WLRD	-	-	-	-	359.00		
	Roundup PowerMax	524-549		WTD	-	-	-	780.00	-		
				Parks	-	-	-	-	15.00		
	Roundup ProMax	524-575		Transit	-	-	1,664.00	-	-		
				WLRD	-	-	-	-	30.00		
	Roundup ProMax	524-479		WLRD	-	-	-	308.00	-		
				WTD	40.00	386.00	97.00	1,770.75	-		
	Roundup ProMax	524-579		Solid Waste	64.00	64.00	72.00	276.00	128.00		
				Parks	82.00	-	27.10	457.60	1,229.87		
				Transit	-	-	-	96.00	-		
				WLRD	-	-	-	-	30.00		
				WTD	228.00	715.00	1,072.25	6.00	1,084.50		
	Roundup Pro Concentrate	524-529 / 534-529		Parks	8,481.36	4,076.62	6,556.40	9,194.30	9,878.90		
	Roundup ProMax	534-579		WTD	1,930.00	-	-	-	162.00		
				WLRD	607.75	112.00	263.50	-	-		
	Roundup Weed & Grass Killer	71995-33		WLRD	13.60	4.00	48.35	-	-		
				Parks	-	-	16.00	-	-		
Imazamox			>100 ug/bee							40.63	-
	Clearcast	241-437		Parks	2,394.08	2,149.45	-	-	-		
				WLRD	330.70	207.00	89.10	25.00	5.00		
Isoxaben			>100 ug/bee							1.29	-
	Gallery 75DF	62719-145		Airport	-	-	10.50	-	3.12		
				WLRD	59.30	6.00	-	-	-		
				WTD	10.00	5.00	-	44.00	27.45		
Pelargonic Acid			>25 ug/bee							21.15	-
	Scythe	10163-325		Parks	30.72	-	-	586.50	1,885.00		
				WLRD			170.00	-	-		

Gallery		62719-529	WTD	-	-	-	-	34.50		
Sethoxydim Naphtha			>11 ug/bee						0.47	-
	Poast	7969-58	WTD	-	48.00	-	-	12.00		
Sulfometuron methyl			>100 ug/bee						0.06	221
	Oust	352-401	WTD	-	-	0.13	0.13	8.00		
	Oust XP	352-601	Roads	33.00 lbs	12.00 lbs	51.00 lbs	15.00 lbs	57.00 lbs		
			WTD	5.00 lbs	0	0	0	0		
	Oust XP	432-1552	Roads	0	30.00 lbs	0	0	0		
	Sulfomet XP	352-601	Roads	0	0	0	18.00 lbs	0		
Tetrahydrofurfuryl Alcohol			>47 ug/bee						8.79	-
	PrimoMaxx	100-937	Parks	-	-	100.00	650.00	375.00		
Triclopyr-2-butoxyethyl ester			>100 ug/bee						233.45	-
	Element 4 / Garlon 4	62719-40	Roads	-	486.40	-	3,764.00	-		
			Parks	-	440.96	425.91	-	8.00		
			WLRD	-	-	-	-	507.20		
			WTD	33.00	48.00	73.00	2,005.76	229.50		
	Garlon 4 Ultra	62719-527	Roads	2,298.00	751.00	9,976.10	-	8,793.00		
	Turflon	62719-566	WTD	-	-	3.50	-	3.00		
	Turflon Ester	17545-8	Roads	-	-	-	32.00	-		
			WTD	-	-	-	3.00	-		
									1,500.69	221.00
Total (gallons)				250.17	176.02	316.78	373.36	384.35	1,500.69	
Total (pounds)				38	42	51	33	57		221.00

Appendix E Summary of Glyphosate Products Used by Agency 2014-2018

Summary of Glyphosate Products Used by Agency 2014-2018

Active Ingredients	Product Name	EPA Registration #	Dept/Div.	2018	2017	2016	2015	2014	Total (gallons)
Glyphosate - various formulations									1,188.76
	Aquamaster	524-343	WLRD	53.50	168.00	94.31	223.00	1,393.10	
			WTD	205.00	-	-	571.00	-	
			Parks	5,148.20	1,992.00	2,603.31	5,995.00	333.00	
	Aquaneat	228-365	Roads	-	19.20	113.20	99.90	2,831.00	
			WLRD	184.60	76.00	67.85	2,856.00	2,026.70	
			Parks	578.04	711.14	-	-	-	
	Diamondback EZJect	83220-1	WLRD	-	2.65	9.00	0.40	0.40	
			Parks	0.63	65.00	-	-	31.88	
	Ranger Pro	524-517	Roads	7,927.00	8,576.00	11,923.80	10,032.00	13,283.00	
			WLRD	-	-	-	-	99.75	
			Parks	-	-	-	-	91.00	
	Razor Pro	228-366	Roads	-	-	-	33.30	-	
	Rodeo	327-193	WTD	373.00	412.00	1,056.00	-	-	
	Rodeo	62719-324	WTD	168.00	-	-	-	1,033.00	
	Roundup Quick Pro	524-535	Airport	4.00	-	-	-	-	
	Roundup Original	524-445	WLRD	7.10	0.04	-	-	-	
	Roundup Custom	524-343	WLRD	-	-	76.00	-	-	
	Roundup Custom	525-343	WLRD	130.50	202.60	48.00	92.50	6.00	
			Parks	-	-	-	13.75	-	

	Roundup Pro	524-475	Airport	-	-	-	109.50	-
			WLRD	-	39.00	97.31	5.00	-
	Roundup ProDry	524-505	Airport	-	-	210.00	-	60.00
	Roundup Pro Concentrate	524-529	Transit	640.00	768.00	3,584.00	7,620.00	2,560.00
	Roundup OriginalMax	524-539	WLRD	-	-	-	-	359.00
	Roundup PowerMax	524-549	WTD	-	-	-	780.00	-
			Parks	-	-	-	-	15.00
	Roundup ProMax	524-575	Transit	-	-	1,664.00	-	-
			WLRD	-	-	-	-	30.00
	Roundup ProMax	524-479	WLRD	-	-	-	308.00	-
			WTD	40.00	386.00	97.00	1,770.75	-
	Roundup ProMax	524-579	Solid Waste	64.00	64.00	72.00	276.00	128.00
			Parks	82.00	-	27.10	457.60	1,229.87
			Transit	-	-	-	96.00	-
			WLRD	-	-	-	-	30.00
			WTD	228.00	715.00	1,072.25	6.00	1,084.50
	Roundup Pro Concentrate	524-529 / 534-529	Parks	8,481.36	4,076.62	6,556.40	9,194.30	9,878.90
	Roundup ProMax	534-579	WTD	1,930.00	-	-	-	162.00
			WLRD	607.75	112.00	263.50	-	-
	Roundup Weed & Grass Killer	71995-33	WLRD	13.60	4.00	48.35	-	-
			Parks	-	-	16.00	-	-
			Total (gallons)	209.89	143.67	232.03	316.72	286.45
								1,188.76

Appendix F Comparison of IPM Programs

Comparison of IPM programs 2019											
Agency	Governing approach	Pesticide lists	Exemption request system	Record keeping and data requirements	Public reporting	Access to information about the program	Online data reporting tool	Review process for new products or safer alternatives	Lease and contract language	Public engagement programs	Management policy and practices
King County 1. https://www.kingcounty.gov/services/environment/pest-control/integrated-pest-management.aspx ; 2. https://kingcounty.gov/services/environment/pest-control.aspx ; 3. https://www.kingcounty.gov/services/environment/animals-and-plants/noxious-weeds/weed-control-practices/ipm.aspx ; 4. https://www.kingcounty.gov/depts/finance-business-operations/procurement/for-government/environmental-purchasing/Purchasing_Guide/Pest_Management.aspx	Executive Order: https://www.kingcounty.gov/about/policies/executive/utilitiesaeo/put817aao.aspx	Updated version of Tier 1 and 2 product lists (Tier 3 had EPA listed non chemical alternatives included in Grow Smart, Grow Safe, Tier 4 had	Yes, annual request to use or continue to use Tier 1 products for specific issues.	Hand written records, spreadsheet and PDFs.	No	No Multiple program websites, not coordinated or centralized (e.g. Noxious Weeds, IPM program, Procurement, archived Local Hazardous Waste Program pages).	Partial: Noxious Weeds application could be modified to all applicator use and reporting.	Informally, using slightly updated criteria. Safer alternatives and techniques are shared at an annual recertification conference.	Yes, but out of date and not coordinated with IPM program: https://www.kingcounty.gov/depts/finance-business-operations/procurement/for-government/environmental-purchasing/Purchasing_Guide/Pest_Management.aspx	Currently: minimal Natural Yard Care events. Historically had: Grow Smart Grow Safe, pest or product specific information as needed (Crane flies, clopyralid in compost, ducks and diazanon, etc.), Pesticide Free Places, Natural Yard Care Neighborhoods, Childcare givers training, EnviroStars landscapers and training, etc.	Updated version, 2012
San Francisco https://sfenvironment.org/pest-management-for-city-departments#trends .	Ordinance requiring pest management on properties owned or leased by city.	Yes, based on review by P. Dickey (per B DeCaro/SPU), the city has 3 levels of pesticide tables: least, more and most restricted.	Applicators may request a product exemption for a special use pesticide for specific issues.	Yes, in addition to state requirements.	Public meetings of the SF IPM Technical Advisory Committee, online reporting, trends report, and email newsletter.	Centralized, online program information. Content and resources for public and staff. Information for specific audiences include public, policy makers, businesses and city departments	Yes, password protected. No visual or GIS based reporting of pesticide applications.	Yes, SF IPM Technical Advisory Committee	Yes	Yes, through non profit and EPA: www.sfestuary.org/reducing-pesticide-use/	https://sfenvironment.org/pest-management-for-city-departments#trends .
Portland, Oregon https://www.portlandoregon.gov/parks/article/116237	1988 City Council resolution, Oregon State Statute (ORS 262.1), Chapter 943	list of "Approved Management Strategies" and list of Approved Pesticides specific to each work unit	Policy 3: Pesticides Approved for Use by Portland Parks and Recreation Personnel	Policy 6: Pesticide Application Record Keeping	Posting manual, notification of use at a site	IPM Manual only	No	Policy 3: Pesticides Approved for Use by Portland Parks and Recreation Personnel. 15: The PP&R IPM program coordinator shall maintain work unit/site based lists of pesticides approved for use by PP&R personnel on park property. The lists shall be reviewed by the coordinator no less	Policy 14: PESTICIDE APPLICATIONS BY NON-PARKS AND RECREATION EMPLOYEES	Clean Rivers Tips: https://www.portlandoregon.gov/bes/73888	https://www.portlandoregon.gov/parks/article/116237
Portland Metro, Oregon Integrated pest management plan at https://www.oregonmetro.gov/sites/default/files/2017/07/17/integrated-pest-management-plan-06262017.pdf	Metro Policy , Metro Code 2.20.030	Approved chemical list, App B, p. 31	APPENDIX D PESTICIDE USE REQUEST FORM	SECTION 8: PESTICIDE APPLICATION RECORD KEEPING	Posting manual, notification of use at a site	IPM Manual only	No	Integrated Pest Management Advisory Committee (IPM Committee). Every pesticide to be reviewed at least every three years and updates to the list made on a rolling basis.	Direction in: SECTION 9: PESTICIDE APPLICATION BY NON-METRO EMPLOYEES AND CONTRACTORS	Healthy Yard and garden (and use of Grow Smart, Grow Safe) https://www.oregonmetro.gov/tools-living/yard-and-garden/garden-pledge	Integrated pest management plan at https://www.oregonmetro.gov/sites/default/files/2017/07/17/integrated-pest-management-plan-06262017.pdf

Comparison of IPM programs 2019

Agency	Governing approach	Pesticide lists	Exemption request system	Record keeping and data requirements	Public reporting	Access to information about the program	Online data reporting tool	Review process for new products or safer alternatives	Lease and contract language	Public engagement programs	Management policy and practices
Thurston County, Washington https://www.co.thurston.wa.us/health/ehipm/index.html	https://www.co.thurston.wa.us/health/ehipm/pdf/IPMPolicy_REV121614.pdf	For developers, homeowners/land managers, Internal county programs: https://www.co.thurston.wa.us/health/ehipm/ipm_cntyimp.html	https://www.co.thurston.wa.us/health/ehipm/pdf/IPMApproval.pdf	Yes, for annual reporting	Annual public reports with details	Online annual reports and resources	No	IPM Coordinator reviews products against the original Tier Table protocol and include updated criteria such as impact to pollinators, mobility (Thurston Co is actively protecting the aquifer water quality).	Contractors supply a copy of their application notices via county managers to create annual IPM reports.	Grow Smart, Grow Safe - first developed by King County Local Hazardous Waste Program: https://growsmartgrow.safe.org/	https://www.co.thurston.wa.us/tc-weeds/docs/thurston-county-integrated-pest-and-vegetation-management-policy.pdf
Seattle, Washington http://www.seattle.gov/Documents/Departments/ParksAndRecreation/PoliciesPlanning/Seattle_IPM_FAQ_2019(0).pdf	To be updated: Pesticide-Free Parks http://www.seattle.gov/parks/about-us/policies-and-plans/integrated-pest-management	Same Tier Table criteria as King County, Thurston County and San Francisco	Yes	Yes	Will have future pesticides database accessible to public.	Not at this time.	To be designed.	Interdepartmental team review: http://www.seattle.gov/Documents/Departments/ParksAndRecreation/PoliciesPlanning/Seattle_IPM_FAQ_2019(0).pdf	Guidance at http://www.seattle.gov/utilities/business-and-key-accounts/landscapes/design-and-construction	Garden Hotline, workshops, landscaper training, annual recertification symposium, Natural Lawn Care, Pesticide-Free Parks http://www.seattle.gov/parks/about-us/policies-and-plans/integrated-pest-management	Pesticide-Free Parks http://www.seattle.gov/parks/about-us/policies-and-plans/integrated-pest-management
Santa Clara County, California https://library.municode.com/ca/santa_clara_county/codes/code_of_ordinances?nodeId=TITBRE_DIVB28INPEMAPEUS	IPM & Pesticide Use Ordinance No NS517.70 Division B-28 https://library.municode.com/ca/santa_clara_county/codes/code_of_ordinances?nodeId=TITBRE_DIVB28INPEMAPEUS	Sec. B28-6. - Restriction on the use of pesticides. Toxicity Category I or II pesticide products, per State of California	Sec. B28-5. - Pesticide use. One-year exemptions. The County IPM Coordinator may grant a specific exemption, with limited conditions for use, for a one-year period upon a written request.	The departmental IPM coordinator keeps records, submits quarterly to the IPM Coordinator.	Public records, not report	Policy	No	The approved list shall be reviewed and updated at least annually. The IPM Coordinator may amend this list as needed at any time as long as the products are consistent with the established criteria.	Sec. B28-10. - County contracts and easements.	No	Title B - Regulations Division B28 - INTEGRATED PEST MANAGEMENT AND PESTICIDE USE
NY State Dep't of Environmental Conservation https://www.dec.ny.gov/25.html	Pesticide Statutes, Regulations, and Policies https://www.dec.ny.gov/regulations/8527.html	Every pesticide product which is used, distributed, sold, or offered for sale in NY State must be registered by the NYSDEC. https://www.dec.ny.gov/chemical/8528.html	Unknown	APPLICATOR/TECHNICIAN PESTICIDE ANNUAL REPORT http://www.dec.ny.gov/docs/materials_minerals_pdf/for_m26.pdf	No	No	No	Every pesticide product which is used, distributed, sold, or offered for sale in NY State must be registered by the NYSDEC. https://www.dec.ny.gov/chemical/8528.html		1. Neighbor notification: https://www.dec.ny.gov/chemical/8529.html 2. Water Quality tips for Professional Applicators: https://www.dec.ny.gov/docs/materials_minerals_pdf/pestwater.pdf 3. Sustainable landscaping: http://www.dec.ny.gov	
National Park Service https://www.nps.gov/orgs/1103/ipm.htm	IPM approach because it is directed to do so by the Federal Insecticide Fungicide and Rodenticide Act, https://www.law.cornell.edu/uscode/text/7/136r , and NPS policy.	Internal	Yes https://www.nps.gov/orgs/1027/ipm.htm	Internal	No	No	NPS Pesticide Use Proposal System (PUPS) (NPS Only)	Yes	No	Noxious weed volunteer programs	https://www.nps.gov/orgs/1027/ipm.htm

Appendix G IPM in King County Status Report 2000

Integrated Pest Management in King County Government

**A Status Report Through the year 2000 on the
Implementation of the King County IPM Executive Order**



**Prepared by the King County IPM Steering Committee
July 2001**

Appendix H [Executive Order PUT 8-17 \(AEO\)](#)

An Executive Order Requiring Certain King County Departments, Offices, and Agencies to Conduct Pest and Vegetation Management Activities in Accordance with the Tri-County IPM Model Policy and Supporting Guidelines

Document Code No.: PUT 8-17 (AEO)

Department/Issuing Agency: King County Executive Office

Effective Date: November 15, 1999

Approved: /s/ Ron Sims

Type of Action: New

[Signed document](#) (PDF, 173 KB)

EXECUTIVE ORDER

An Executive Order requiring certain King County Departments, Offices, and Agencies to conduct pest and vegetation management activities in accordance with the Tri-County IPM Model Policy and supporting Guidelines, and in accordance with subsequent revisions thereto; designating the Local Hazardous Waste Management Program in King County as the lead agency and resource for Integrated Pest Management by such Departments, Offices, and Agencies; and requiring that such Departments, Offices, and Agencies phase out the use of certain specified materials by June 30, 2000.

WHEREAS, pursuant to the federal Endangered Species Act ("ESA") and effective May 24, 1999, the Puget Sound Chinook Salmon Evolutionarily Significant Unit was listed as "threatened" by the National Marine Fisheries Service, and in the very near future the Puget Sound Bull Trout Evolutionarily Significant Unit will be listed as "threatened" by the United States Fish and Wildlife Service ("USFWS"); and

WHEREAS, the USFWS has promulgated a standing regulation that prohibits all "take" of a threatened species as of the date such a listing becomes effective, and the ESA provides civil and criminal penalties for violations of the ESA and regulations promulgated thereunder; and

WHEREAS, King County Executive Departments, Offices, and Agencies ("King County Agencies") should endeavor to comply with the ESA by minimizing the possibility of causing prohibited "take" of listed species such as the Puget Sound chinook salmon and the bull trout, and King County Agencies should set an example for businesses, other government entities, and citizens in King County to encourage actions that will promote the conservation of such listed species; and

WHEREAS, Integrated Pest Management ("IPM") uses a wide variety of strategies to prevent and address pest problems and to minimize the use of chemical pesticides, and representatives from local jurisdictions in King, Pierce, and Snohomish counties developed a model Tri-County IPM Policy and supporting Guidelines with the aim of reducing the potential impact of pesticide use on listed species such as the Puget Sound chinook salmon and the bull trout, and implementation of the model Tri-County IPM Policy and supporting Guidelines by King County Agencies will result in better long-term management of vegetation and pest problems in King County, and is likely to contribute to improvement in public health and the environment in King County, including but not limited to the habitat, food, and sensitive life stages of threatened chinook salmon and bull trout; and

WHEREAS, at the request of the City of Seattle, the Washington Toxics Coalition conducted a Preliminary Assessment of Pesticides Used by the City of Seattle and compiled prioritized tables of products to be phased out of use by the City of Seattle, and at King County's request subsequently compiled similar tables of products to be phased out of use by King County; and

WHEREAS, pursuant to King County Charter §320.20, the county executive shall have all the executive powers of the county which are not expressly vested in other specific elective officers by the charter, and shall supervise all administrative offices and executive departments established by the charter or created by the county council; and

WHEREAS, pursuant to King County Code §2.16.020(E)(8), the county executive may assign duties and functions to departments to ensure that the county complies with applicable state and federal laws, regulations and requirements, so long as such duties and functions are not assigned to another department by the county charter or the county council; and

WHEREAS, matters concerning the internal management of county agencies do not constitute "rules" subject to the requirements of K.C.C. 2.98.010 et seq.;

NOW, THEREFORE, I, Ron Sims, King County Executive, hereby do order that the following King County Agencies implement the following internal priorities and procedures regarding IPM in order to comply with the ESA and regulations promulgated thereunder, and to improve public health and the environment in King County:

1. All King County Agencies that conduct pest and vegetation management activities in the course of their assigned duties shall develop Agency-specific IPM programs and conduct other related activities in accordance with the Tri-County IPM Model Policy and supporting Guidelines, dated August 12, 1999, which are attached to this Executive Order and incorporated herein by reference, and in accordance with any subsequent revisions of those or King County-specific documents as may be approved by the Local Hazardous Waste Management Program ("Hazardous Waste Program").
2. The Hazardous Waste Program shall be the lead agency within King County to coordinate, and offer technical assistance for, IPM implementation by King County Agencies that conduct pest and vegetation management activities in the course of their assigned duties. The Hazardous Waste Program shall assist all such King County Agencies to develop Agency-specific IPM programs.
3. King County Agencies shall coordinate implementation of Agency-specific IPM programs via a King County IPM Steering Committee, as described in the Tri-County IPM Model Policy. All King County Agencies that conduct pest and vegetation management activities in the course of their assigned duties shall participate in the King County IPM Steering Committee.
4. By June 30, 2000, all King County Agencies that conduct pest and vegetation management activities in the course of their assigned duties shall, to the maximum extent practicable, phase out use of the products listed in Tier 1 of Tables 1-4 attached to this Executive Order and incorporated herein by reference. The King County IPM Steering Committee and the Hazardous Waste Program shall assist such King County Agencies to phase out use of Tier 1 products in accordance with the Preliminary Assessment of Pesticides Used by the City of Seattle, attached to this Executive Order and incorporated herein by reference, as well as in accordance with the Tri-County Model IPM Policy and the supporting Guidelines.

DATED this 5th day of November, 1999.

/s/ Ron Sims, King County Executive

ATTEST:

/s/ Robert Bruce, Acting Manager
King County Records and Elections Division