Olympic Region, Area 4
Integrated Roadside Vegetation Management Plan
2014

Washington State Department of Transportation
Maintenance Operations Division
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Summary

This plan explains the Washington State Department of Transportation’s (WSDOT) policy and practice for maintenance of roadside vegetation for Maintenance Area 4 within the agency’s Olympic Region. This area manages vegetation within approximately 250 miles of state highway corridor in Grays Harbor and western portions of Mason and Thurston Counties. The major corridor in the area is State Route 8/US 12, which is the major connection between the Puget Sound basin and the Washington Coast. Other corridors include 85 miles of US 101, State Routes 12, 105, 107, 108, 109, and 115. A map of the area is included as Figure 1 on the following page.

The primary objectives in maintenance of roadside vegetation within the area are in relation to safety of the highway users and control of legally designated noxious weeds where they occur on the right of way. Other considerations include the efficient and effective use of state resources, protection and preservation of the natural environment, preserving and enhancing the natural scenic quality of the roadside, and being a good neighbor to the many adjoining property owners. In all cases, roadside vegetation maintenance activities are planned and conducted in a way that discourages or eliminates unwanted vegetation and promotes desirable vegetation. This is the basic premise of Integrated Vegetation Management (IVM) and the foundation of the program.

This document and associated information management tools serve as the primary reference for maintenance of roadside vegetation in the area. Included is detailed information on locations for reoccurring routine maintenance practices, reoccurring weed infestations, sensitive areas, and other areas with special management considerations. Also included are guidelines and prescriptions for best management practices in dealing with roadside vegetation problems and opportunities. In effect, this plan supports WSDOT’s compliance with state law (RCW 17.15) by implementing the principles of Integrated Pest Management for the management of roadside vegetation. It also supports WSDOT’s long-range goals for the management of roadsides to:

- Create naturally stable, sustainable plant communities
- Improve effectiveness and efficiency in the control of weeds and unwanted trees and brush
- Reduce maintenance cost and herbicide use over time

This plan is organized around the major categories of roadside vegetation maintenance work. The major categories include: Pavement Edge Maintenance, Routine Mowing/Trimming, Noxious Weed Control, Nuisance Weed Control, Tree and Brush Control, and Special Maintenance Areas.

The management of roadside vegetation is a dynamic process and it is intended that this plan be continuously adapted over time based on input from a variety of sources. An integral component of this process is a database for recording IVM treatments for specific vegetation controls and locations, and to record information on follow up evaluation of these treatments. Annual area meetings will be held to discuss what is learned each year and refine the plan over time.

WSDOT is also requesting that local public and private entities with an interest in weed control and roadside vegetation management provide input on the plan and cooperate in efforts where appropriate. Copies of the complete plan are available online: [http://www.wsdot.wa.gov/Maintenance/Roadside/mgmt_plans.htm](http://www.wsdot.wa.gov/Maintenance/Roadside/mgmt_plans.htm), hard copies can also be provided upon request. Please contact Randy Moody or Ray Willard at the numbers listed below for questions or comments:

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Olympic Region, Area 4 Map

Figure 1
Roadside Management Considerations

The primary objectives for maintenance of roadside vegetation are to provide for safe highway operation and to comply with legal regulations for control of noxious weeds and protection of the environment. Overall WSDOT maintenance policy and procedures are defined in Chapter 6 of the WSDOT Maintenance Manual (M51-01, August 2014) http://www.wsdot.wa.gov/Publications/Manuals/M51-01.htm

Visual Quality
It is also important to maintain appropriate visual standards in the appearance of the roadside. All maintenance activities should be conducted in a way that minimizes visual impacts such as widespread “brown-out” from herbicides or shattered limbs from side trimming. Roadsides should look as natural as possible throughout the year. Appropriate visual quality for roadsides throughout the state is defined in the WSDOT Roadside Classification Plan (November 2011) http://www.wsdot.wa.gov/Publications/Manuals/fulltext/M25-31/RCP.pdf

Operational Zones
WSDOT roadsides are divided into several zones for the purposes of assigning management objectives, maintenance needs, and thresholds for triggering vegetation maintenance actions. Noxious weed species designated for control by state and county law are controlled throughout all zones. Not all management zones occur along all state highways. In some cases the narrow width of the right-of-way or adjoining land-use, limits the operational zones to Zone 1 and/or a narrow Zone 2 only. Roadside vegetation management zones are illustrated in Figure 2 below and defined as follows:

Zone 1 – The Pavement Edge Zone is maintained in a manner and width necessary to address highway operational functions and safety, pavement preservation, guardrail maintenance, and stormwater management. Zone 1 may include a vegetation-free band adjacent to the pavement edge, particularly when guardrail is present, or may consist of desirable vegetation up to the pavement edge depending on site specific needs. Vegetation-free Zone 1 is maintained using non-selective soil residual herbicides. Routine annual mowing is required in most cases where vegetation is established up to the edge of pavement; periodic grading may also be required to prevent excess edge build up.

Zone 2 – The Operational Zone extends from Zone 1 to a width necessary to provide for safe errant vehicular recovery, site distance at corners, intersections and for regulatory signs, and to provide for other operational, safety, and environmental protection functions. Zone 2 is typically maintained through periodic mowing and trimming and through selective removal of undesirable trees and brush as needed.

Zone 3 – In areas with sufficient right-of-way width, a Buffer or Transition Zone extends from Zone 2 to the right-of-way line to provide a buffer or transitional area between the highway facility and adjacent land uses. This area is maintained selectively, and to the greatest degree possible as a self-sustaining plant community, to minimize erosion as well as the growth of weeds and undesirable trees and brush.

Roadside Maintenance Activities
All roadside maintenance activities are to be planned and conducted in a way that discourages or eliminates unwanted vegetation and promotes desirable vegetation. This is the basic premise of Integrated Vegetation Management. In every case it is essential that the results of maintenance activities are evaluated and adjusted as necessary to maximize efficiency and effectiveness, and to establish desirable plant communities that are as self-sustaining as possible. However, in some cases maintenance activities are planned and conducted on a regularly scheduled repeating basis, such as maintenance of a vegetation-free Zone 1 and/or routine mowing cycles where appropriate.
**Routine Maintenance Activities** – When vegetation maintenance activities are intended to keep the area of roadside being treated in an annually controlled condition, they are considered routine. This is more critical for areas of vegetated roadside near the travel lanes, edge of pavement, and around guardrails. This plan provides prescriptions and gives locations for routine maintenance activities including maintenance of Zone 1 and annual mowing.

**Integrated Vegetation Management Activities** – Although all activities are to be planned and conducted in accordance with the principles of IVM, many vegetation maintenance activities are intended to target a specific type or types of unwanted plants. By carefully planning and carrying out these target specific activities it is possible over time to establish desirable vegetation, which will prevent the re-infestation of unwanted plants. The process for determining and carrying out IVM actions is illustrated in Figure 3 below. This plan provides information, locations, and gives prescriptions for selective control of weeds and other unwanted vegetation and the promotion and establishment of desirable vegetation. Further information and guidance on the application of IVM is available in the document Integrated Vegetation Management for Roadsides (WSDOT, July 1997). A copy of this document can be obtained by contacting the state roadside maintenance program manager.

**Special Maintenance Areas** – In some locations there are unique situations that require special consideration in determining appropriate vegetation maintenance actions. Examples of these are: environmentally sensitive areas, areas with special neighbor concerns, areas where a higher level of maintenance is expected such as gateway interchanges or formally landscaped areas, or along highways that cross tribal or federal lands. This plan provides information and guidance on the locations and unique requirements or restrictions on maintenance activities in all of these situations throughout the area.

**Herbicide Use** – WSDOT has conducted independent research on herbicide risk from toxicity and environmental fate, based specifically on agency application methods and use rates. Findings from this research have been used to establish an approved palette of herbicides and application limits for state highways. A complete summary of herbicides approved for use on WSDOT rights of way is included in Appendix B.

For all planned herbicide applications made on US Forest Service land WSDOT will submit a Pesticide Use Proposal Form (see Appendix D) to the Forest Service R6 Pesticide Use Coordinator at the start of each season, or at least one week prior to any scheduled application. At the end of each season the WSDOT HQ Maintenance Office will submit a report outlining herbicide use performed for highway sections in each National Forest.
Typical Roadside Vegetation Management Zones

Figure 2

Pavement Edge Zone
Low Growing or Routinely Mowed Vegetation and/or Vegetation-Free Strip
Maintained using mechanical and/or chemical methods for sight distance, stormwater drainage and filtration, noxious weed control, pavement preservation and roadside hardware maintenance.

Operational Zone
No Vegetation with Stem Diameter Greater than 4"
Maintained using IVM techniques for sign visibility, sight distance, errant vehicle recovery and weed control.

Buffer Zone
Native or Naturally Occurring Vegetation
Where adequate right of way exists, maintained using IVM techniques to encourage desirable, self-sustaining plant communities.
The IVM Decision-Making Process

Figure 3
Area IVM Goals – 2014

The purpose of this section is to identify the highest priority roadside vegetation management needs in Olympic Region, Area 4 and to describe in general the approach the area will take in addressing these needs in the coming years. Information here is presented in relation to the three major groups for roadside vegetation maintenance performance: Control of Vegetative Obstructions, Noxious Weed Control, and Nuisance Weed Control. This section is intended to supplement the information in the following section, Olympic Region, Area 4 – Roadside Vegetation Management Plan which details the guidelines and methods for accomplishing the work of roadside vegetation management along the highways within this maintenance area.

Control of Vegetative Obstructions
The work of this group of maintenance activities relates to the safety and operation of the highway and these items are considered first priority in terms of the overall roadside maintenance needs. Vegetation management goals in this category fall into two groups – Pavement Edge Maintenance/Zone 1, and Tree and Brush Control/Zone 2.

Pavement Edge Maintenance/Zone 1
- For most highways in the area a 2 to 3 ft. band of bare ground is maintained through the annual spring application of non-selective, pre and post-emergent herbicides.
- For the sections of US 101 and SR 109 that pass through the Quinault Reservation a 2 to 3 ft. band is treated annually in the spring along the edge of pavement using only non-selective, Quinault Nation approved, herbicide labeled for aquatic application. Due to vegetative re-growth following these applications shoulders are also mowed one pass in mid to late summer.
- For the section of US 101 passing through the City of Hoquiam’s drinking water recharge area between MP 94.45 and 100.33, WSDOT does not apply herbicide and shoulders are maintained by the City through mowing once per year. Build up along the pavement edge throughout this section is typically requires grading and removal once every 3 to 4 years.
- For the section of US 101 passing through the Olympic National Forest between MP 118.08 and 121.8 no herbicide applications are made to the shoulder and mowing passes are conducted at least two times a year as needed. Guardrail runs and bridge ends are maintained by mowing with hand tools.
- For the section of SR 115 between MP 0.00 to 0.22, which runs through a school zone, this area will not receive a Zone 1 application. Zone 2 in this area will receive spot spray treatment and only during months where school is not in session.
- Steel plow is run on all routes, in areas without guardrail to remove minor amounts of shoulder buildup.
- Shoulder buildup through unincorporated towns, such as Grayland on SR 105 and Moclips on SR 109, will be graded and debris removed.

Tree and Brush Control/Zone 2
- Continue to prune for encroaching and overhanging branches as needed on all routes throughout the area.
- At risk trees identified, evaluated and removed from Zones 2 & 3

WESTSIDE
- Mowing around intersections on SR 105, MP 37 to 30.45
- Mowing & brush cutting SR 109, MP 15.6 to MP 21.39 before the 4th of July
- Brush cutting SR 109 SB, MP 27.62 to 27.8 (Ocean view point)
- Mowing US 101, MP 120 to 125
- Brush cutting willows on SR 105, MP 45.2 to MP 42 and MP 28 to MP 29

EASTSIDE
- Brush cutting and tree trimming SR 8, All
- Brush cutting US 12, MP 13 - 15 B / 17 - 18 E / 18.6 - 19.8 B / 35.5 – 37.5 / 45
- Tree trimming US 101, MP 67.5 - 76.4 / 360.3 - 360.8 S
- Brush cutting and tree trimming SR 107 MP 0.2  1.8 / 5 - 5.6
- Tree trimming SR 108, MP 6.6 - 11.3

Noxious Weed Control
Noxious weeds are those species legally designated by state and county regulations for required control by all property owners. Because laws are enforced with fines and/or control work and billing of property owners by county administration, work under this group is considered second priority after critical safety related locations have been addressed. Control of designated noxious weed species is typically carried out on all highways throughout the area on an as needed basis. However, some locations merit more focused attention and effort to apply multi-year IVM treatments or coordinate with adjacent landowners. The general area-wide approach and areas of focused attention for 2014 include:

WESTSIDE
- Gorse, SR 105, MP 32.65 - 25.7
- Gorse SR 109, MP 24.25 and MP 29.44
- Himalayan Knotweed SR 12, MP 9.4
- Himalayan Knotweed SR 105, MP 26.47
- Himalayan Knotweed SR 109, MP 40
- Japanese Knotweed SR 12, MP 2 - 8 various locations
- Japanese Knotweed SR 101, MP 78 - 80.2 (Cosi Hill) / 89.2 - 100 / 122 / 127.8 / 144
- Japanese Knotweed SR 105, MP 25.7 to 47.4 various locations
- Japanese Knotweed SR 109, MP 3.3 to 40 various locations
- Japanese Knotweed SR 109 Spur, MP 0-1.8
- Mouse ear Hawkweed SR 109, MP 29.8 - 30.1
- Orange Hawkweed SR 12, MP 5.1 - 5.6
- Orange Hawkweed SR 101, MP 104.2 - 104.5 / 136.45 - 136.7
- Orange Hawkweed SR 105, MP 36.2 - 36.4
- Spotted Knapweed SR 101, MP 114.1 - 114.2
- Spotted Knapweed SR 105, MP 45.90
- Yellow Hawkweed SR 109, MP 12 - 12.2

EASTSIDE
- Japanese Knotweed SR 8 MP 1.1 (Cloquallum Bridge)
- Japanese Knotweed US 12 MP 20.3 EB 3rd St On Ramp
- Japanese Knotweed SR 101 MP 76 SB (Across from Clarks)
- Japanese Knotweed SR 107 MP 6 - 3 SB
- Orange Hawkweed SR 8 MP 13.8 (median)
- Shiny Geranium US 101 MP 361 – 361.6 NB
- Skeleton Weed US 12 MP 42.6 to 42.9 EB (Just west of Roseburg St.)
- Spotted Knapweed SR 8 MP 5.5 - 6.5 (median) / 10.8 - 12
- Spotted Knapweed US 12, MP 22.5 / 16.2 W
- Spotted Knapweed SR 108, MP 3.3
- Spurge Laurel US 12, MP 43.5
• Spurge Laurel US 101, MP 360 - 362 B
• Toadflax SR 8, MP 0.9 W
• Wild Chervil US 12, MP 18.8 W (Pepsi Plant) / 41.0 W

Nuisance Vegetation Control
Nuisance vegetation control includes control/management of weed species that are recommended but not mandated by state and/or county law. It also includes work such as mowing of grass and weeds in areas where a more neatly maintained appearance is desired such as in gateway interchanges or highways in urbanized areas. Because nuisance vegetation control is lower priority after safety related and legally mandated activities, the location and work actions listed below may be postponed depending on availability of resources. For 2014, the overall approaches to control of nuisance vegetation and locations where focused efforts will be applied if time and resources allow include:

WESTSIDE
• Alder and Scotch Broom SR 12 Aberdeen Bluff
• Scotch Broom and Blackberries SR 12 Devonshire Interchange
• Scotch Broom and Alder SR 101 MP 77 and SR 107 Junction

EASTSIDE
• Scotch Broom and Blackberry SR 12, 3rd st. & Elma Interchange
• Scotch Broom SR 8, MP 1.5 - 5.5 B / 10.5 - 12.5 W / 17.8 - 18.3 B
• Canadian Thistle SR 8, MP 6 - 6.1 E / MP 11.5 - 14 B
• Canadian Thistle US 12, MP 15.5 - 15.8 E
• Teasel SR 8, MP 39.3 E
1. ROUTINE MAINTENANCE ACTIVITIES

Roadside maintenance activities are considered routine when a regularly occurring cycle of treatment is required to keep vegetative growth from interfering with highway operational and maintenance objectives. Typical routine maintenance activities are maintenance of a vegetation-free band at the edge of pavement where required, and certain types of mowing and trimming operations.

1.1. Bare Ground Shoulder Maintenance (Zone 1)

In some locations/situations it is most efficient and effective to maintain a vegetation free band of shoulder rock along the edge of pavement. In most cases this is achieved through the annual application of herbicides. Annual herbicide applications are required where a vegetation-free condition is specified.

1.1.1. Guidelines

- A vegetation-free Zone 1 is maintained on the majority of shoulders throughout the area, except in designated locations as noted in this plan.
- In designated areas where grass is established up to the edge of pavement, a vegetation-free Zone 1 will still be maintained under guardrail in these areas. There are two exceptions where Zone 1 is not maintained under guardrail including US 101 through the City Hoquiam Drinking Water Protection Area and US 101 with the Olympic National Forest. In these locations vegetation under guardrail will be maintained as needed with hand tools.
- The width of Zone 1, where it is maintained, is 2 to 3 ft. width.

1.1.2. Methods

- A mixture of soil residual pre-emergent and non-selective post-emergent herbicides will be applied annually in the spring.
- For sections of US 101 and SR 109 across the Quinault Reservation, an aquatic formulation of non-selective, post-emergent herbicides will be used with an aquatic surfactant.
- Treatment prescriptions are listed in Appendix A, Zone 1 Maintenance – Bare Ground Treatment

1.1.3. Locations

- Delineation for vegetation-free Zone 1 maintenance can be found using a web base map viewer application at: IVM Map Viewer

Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

1.2. Mowing/Trimming (Zones 1 and 2)

Regular mowing cycles are required in most locations where a vegetation-free Zone 1 is not maintained and grass is established up to the edge of pavement. Even in some locations where a vegetation-free Zone 1 is maintained, seasonal grass growth near the road edge is tall enough to interfere with traffic operations and safety. In addition, some locations, particularly on secondary highways with narrow rights of way, regular periodic side trimming is required to prevent growth of shrubs/brush or side branches on trees from interfering with traffic operations and safety.

1.2.1. Guidelines

- Routine annual mowing is conducted on all shoulders where a vegetation-free Zone 1 is not maintained.
• Annual mowing or trimming is also conducted as needed for locations on all highways to preserve site distance at curves, intersections and any other highway entry points.
• In all other areas mowing is only used occasionally as part of IVM treatments for weed and brush control as described below in Section 2.

1.2.2. Methods
• In areas where vegetation-free Zone 1 is not maintained, annual mowing will consist of a single pass, 4’ to 6’ in width, depending on the equipment used.
• See Appendix A, Routine Maintenance Prescriptions, Zone 2 Maintenance

1.2.3. Locations
• Locations routinely mowed for site distance and sign visibility exist throughout the area and locations will be determined as needed in the field.

1.3. Hazard Tree Monitoring and Removal (Zone 3)
In areas where there is adequate right of way width to accommodate Zone 3 the main objective is to establish vegetation that requires as little maintenance as possible. Activities conducted are targeted selectively at removal of unwanted vegetation and establishment of desirable vegetation. However, large trees with health or structural problems can pose a significant threat to the highway, therefore both monitoring for the presence of potential hazard trees and removal when necessary are considered routine and ongoing roadside maintenance activities.

1.3.1. Guidelines
• Hazard tree removal is considered a routine maintenance activity because maintenance is constantly on the lookout for any trees that pose an imminent threat to the highway or traffic. Whenever hazard trees are identified they are routinely removed as soon as possible.
• Hazard trees may be dead, diseased, leaning, or structurally unsound. Best horticultural judgment will be used in evaluating trees that appear diseased or structurally unsound or are believed to pose a long-term threat to determine the best course of action.
• Another consideration in removal of trees is the contribution to shading in areas prone to frost and ice formation on the highway surface. When such areas are identified, the surrounding canopy may be thinned through selective removal of large trees on the right of way.
• In some cases trees threatening the highway may be growing on neighboring property. In these cases WSDOT has the legal right to remove the trees after informing and consulting with the neighboring property owner.

1.3.2. Methods
• Hazard trees are removed in such a manner to minimize damage and impact to the highway structure and other healthy trees and under-story vegetation.
2. INTEGRATED VEGETATION MANAGEMENT ACTIVITIES

All roadside vegetation maintenance activities technically fall under IVM. IVM is a coordinated decision making process that uses the most appropriate vegetation management methods and strategy, along with a monitoring and evaluation system, to achieve long-term roadside maintenance goals and objectives in an environmentally and economically sound manner. Even routine activities should be evaluated for effectiveness and refined whenever possible to reduce annual maintenance requirements. However, for the following activities the ultimate goal is to eliminate and prevent the future growth of unwanted plants, and to promote and enhance desirable vegetation. Activities are planned and carried out using the decision making process diagrammed in Figure 3 on page 7. The goal in utilizing the IVM approach is the establishment of stable, low maintenance native or naturalized plant communities on the roadside that are compatible with:

- Highway maintenance and safety objectives
- Preservation of environmental quality
- Weed control requirements
- The concern’s of WSDOT’s customers and neighbors

Long term, the use of the IVM approach can reduce the intensity and cost of maintenance as well as minimizing the need to use herbicides.

2.1. Integrated Vegetation Management Planning and Tracking Database

2.1.1. Guidelines

- An Integrated Vegetation Management Records database is available for use. This database is accessed through the same WSDOT network application as the Pesticide Application Records database.
- Any activities focused on treatment of a specific location and species infestation, or focused on treatment of any types of unwanted vegetation throughout the area will be documented with an initial IVM record outlining the long-term treatment plan. These same records will be updated over time whenever planned treatments are carried out, or when observations are made as to the success or failure of past treatments.
- Treatment records may be printed out and inserted into Appendix D.

2.2. Noxious Weed Control

WSDOT defines noxious weeds as any species listed for mandatory control under state law (WAC 16-750) or by the local county codes. Other weed species that may be listed as noxious weeds on the state and county lists but not legally mandated for control are defined as nuisance weeds and managed as described under section 2.3 in this plan.

2.2.1. Guidelines

- Noxious weed control is a high priority for WSDOT because of state law requiring control of designated species. Transportation rights of way are high priority locations for control of noxious weed species within the state because they cross and link so many adjacent properties and land uses and may act as conduits for the spread of weeds.
- Whenever possible, designated noxious weed species and infestations locations will be documented and treated following plans as defined by IVM record forms in the database.
Washington State Law classifies noxious weeds in three classes: A, B, and C. All Class A species are required control wherever they occur statewide. The law allows for individual county weed boards to designate individual Class B and C weeds for control within the counties depending on how widespread and potentially harmful they are at the local level.

For Olympic Region, Area 4 the following designated weeds are known to exist on state highway rights of way in Grays Harbor and western portions of Mason and Thurston Counties:

**Class A**
Class A noxious weeds are non-native species with a limited distribution in the state. No Class A weeds are known to exist on WSDOT rights of way in this area.

<table>
<thead>
<tr>
<th>Common Name/Botanical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiny geranium/Geranium lucidum</td>
</tr>
</tbody>
</table>

**Class B**
Class B weeds are more widespread than Class A, with control mandated by law only if infestations are generally limited and the species are designated within the individual counties by the County Noxious Weed Control Boards. The following species are known to be present on highway rights of way in the area and are designated for control:

<table>
<thead>
<tr>
<th>Common Name/Botanical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ragwort tansy/Senecio jacobaea</td>
</tr>
<tr>
<td>Knapweed sp./Centaurea sp.</td>
</tr>
<tr>
<td>Purple loosestrife/Lythrum salicaria</td>
</tr>
<tr>
<td>Wild chervil/Anthriscus sylvestris</td>
</tr>
<tr>
<td>Orange hawkweed/Hieracium aurantiacum</td>
</tr>
<tr>
<td>Gorse/Ulex europaeus</td>
</tr>
<tr>
<td>Japanese knotweed/Polyginum cuspidatum</td>
</tr>
<tr>
<td>Himalayan knotweed/Polyginum polystachyum</td>
</tr>
</tbody>
</table>

**Class C**
Class C noxious weeds are widely established throughout Washington or may impact the agricultural industry. At this time no Class C weeds are required for control in any of the counties where rights of ways are maintained by Olympic Region, Area 4.

<table>
<thead>
<tr>
<th>Common Name/Botanical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spurge laurel/Daphne laureola</td>
</tr>
</tbody>
</table>

2.2.2. Methods
- Because noxious weed species are often difficult to control, herbicides treatments are often the primary, initial means of control.
- If infestations are limited to a few plants, hand pulling is also effective when the entire root system is also removed. Maintenance employees are encouraged to be aware of and look for new noxious weed occurrences, and to stop and pull these plants whenever possible.
- In conjunction with weed control treatments, a variety of other measures may be taken to promote natural vegetative competition through seeding, planting, and soil enhancement. The IVM Record
and database are essential to the execution and success of these control measures.

- For recommended treatments specific to noxious weed species, see Appendix A, IVM Prescriptions, Noxious Weed Control

2.2.3. Locations

- Priority locations for control of designated noxious weed species in Olympic Region, Area 4 can be found using a web base map viewer application at: IVM Map Viewer
  Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

2.3. Nuisance Weed Control

For the purposes of this plan, nuisance weed species are defined as species listed as Class B and C weeds on the state noxious weed lists, but not required for mandatory control within individual counties. Nuisance weed control, while not required by state law, provides many positive benefits to the overall condition of the roadside, enhances ecological function by maintaining and enhancing native plant communities, reduces the potential for continuing spread of weed infestations, and enhances visual quality.

2.3.1. Guidelines

- Nuisance weed species will be controlled when time and budget allows.
- Priority will be given to locations with the highest chance for success including relatively new infestations and where there is potential for infestations to spread to un-infested areas of the right of way or to un-infested neighboring properties.
- Species designated as nuisance weeds in Olympic Region, Area 4 and known to exist on the highway right of way include:

<table>
<thead>
<tr>
<th>Common Name/Botanical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butterfly bush/Buddleja davidii</td>
</tr>
<tr>
<td>Poison hemlock/Conium maculatum</td>
</tr>
<tr>
<td>St. Johnswort/Hypericum perforatum</td>
</tr>
<tr>
<td>Common tansy/Tanacetum vulgare</td>
</tr>
<tr>
<td>Bull thistle/Cirsium vulgare</td>
</tr>
<tr>
<td>Canada thistle/Cirsium arvense</td>
</tr>
<tr>
<td>Scotch broom/Cytisus scoparius</td>
</tr>
<tr>
<td>Wild carrot/Daucus carota</td>
</tr>
<tr>
<td>Common Mullein/Verbascum thapsus</td>
</tr>
<tr>
<td>Himalayan blackberry/Rubus discolor</td>
</tr>
</tbody>
</table>

2.3.2. Methods

- Control measures for nuisance weed are dependent on the type of plant.
- Woody species such as Scotch broom and Himalayan blackberry are most effectively treated with a combination of cutting, herbicide treatments and encouragement of native vegetation.
- Perennial species such as Canada thistle are most effective controlled by succeeding years of properly timed herbicide applications.
- Annual or biennial species such as bull thistle and common tansy may also be effectively controlled with herbicide applications when
plants are in the rosette stage in spring, or by hand pulling prior to seed set.

- In some cases biological controls are the best means for managing widespread nuisance weed species.
- See Appendix A, IVM Prescriptions, Nuisance Weed Control.

2.3.3. Locations

- Focus areas for priority nuisance weed control activities are listed in the IVM Goals section on Page 7.

2.4. Tree and Brush Control

2.4.1. Guidelines

- Trees and brush are controlled for safety reasons including preservation of sight distance at curves and intersections, and for visibility of signs, and preventing trees with large trunk diameter from growing too close to traffic lanes.
- Native large shrub and small tree species should be allowed to grow and mature in Zone 2 and selectively trimmed if they begin to encroach on site distance or other traffic operational requirements.
- Large coniferous or hardwood deciduous tree species such as Douglas fir, bigleaf maple, alder, or cottonwood left to grow in Zone 2 and in some cases parts of Zone 3, can reach substantial size over a relatively short period of time and should be removed when young.
- Any tree with a trunk diameter of 4” or greater is considered a hazard for errant vehicles in Zone 2 and should be removed. This zone is also referred to as the Design Clear Zone and is typically maintained to a width of 30’ from the traffic lane edge. Actual minimum widths are determined by roadway alignment, traffic speed and volume, and cross-section of the roadside, as specified in the WSDOT Design Manual, Chapter 700.04. http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm

2.4.2. Methods

- Removal of undesirable tree and brush species is typically accomplished by hand cutting, hand pulling, properly timed selective mowing, properly timed herbicide applications, or combinations thereof.
- In some locations it is most effective to mow back the majority of the existing vegetation and then selectively treat undesirable re-growth with herbicides in succeeding years, allowing desirable vegetation to grow up around and form a competitive cover.
- In some cases when tree and brush species are cut by hand, the debris can be fed through a chipper and placed back on the roadside in the form of mulch.
- Timing of these activities has a significant effect on how the vegetation grows back. Herbicide applications made by hand, directly to the cut surfaces of undesirable plants may be used to reduce or eliminate grow back.
- Chemical control methods will not be used on conifers greater than 2 feet in height.
- Chemical control methods will not be used on deciduous plants until after the first of September, except for as stump treatments in conjunction with mechanical cutting to eliminate grow-back.
- Whenever possible, safe and practical, seedling trees will be dug or pulled by hand and transplanted to areas where their growth will be beneficial and appropriate. Agreements may be signed to allow private citizens to collect seedlings for use as transplants.
- See Appendix A, IVM Prescriptions, Tree and Brush Control.
3. SPECIAL MAINTENANCE AREAS
Special Maintenance Areas are any locations with unique maintenance requirements or special considerations for roadside management. These areas may include interchanges, community entrances or enhancement areas, areas maintained by cities, bicycle paths, storm water retention ponds, state park land, wellheads, environmentally sensitive areas, school zones and roadsides adjacent to individual properties with current or annual no-spray agreements.

3.1. Interchanges/Intersections

3.1.1. Guidelines
- Interchange areas are sometimes developed to a greater level than general roadside areas to include storm water management facilities, pedestrian areas, and permanent vegetation designed for screening, and visual enhancements for community entrances.

3.1.2. Locations
- Interchanges and intersections with unique maintenance considerations and/or interchanges that are considered urban gateways along with a description of special maintenance activities can be referenced using a web base map viewer application at: [IVM Map Viewer](#)  
Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

3.2. City Maintenance Areas

3.2.1. Guidelines
- In most cases where non-limited access highways exist within city limits, the roadside (all area outside the highway pavement and drainage systems) are maintained by the local city government.

3.2.2. Locations
- Areas where roadsides are maintained by cities can be referenced using a web base map viewer application at: [IVM Map Viewer](#)  
Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

3.3. Herbicide Sensitive Areas

3.3.1. Guidelines
- In some situations herbicide use is limited or restricted because of legal requirements, neighbor concerns, or WSDOT imposed environmental safety precautions.  
- In these locations, vegetation must be managed without the use of herbicides or with only a limited palette of herbicide types.

3.3.2. Locations
- Herbicide sensitive areas and reason/type of limitations on herbicide use can be referenced using a web base map viewer application at: [IVM Map Viewer](#)  
Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.
3.4. Adopt-a-Highway and Neighbor Maintained Agreements

3.4.1. Guidelines
- In some locations WSDOT has signed agreements with private citizens or neighboring businesses for maintenance of roadside vegetation.

3.4.2. Locations
- Areas with existing agreements for others to maintain a portion of the roadside, along with notes describing arrangements for each location can be referenced using a web base map viewer application at: IVM Map Viewer. Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

3.5. Storm Water Management Facilities

3.5.1. Guidelines
- Storm water management facilities include bio-filtration swales, retention ponds and infiltration ponds.
- Storm water management facilities are managed for noxious and nuisance weeds, and hazard trees following the same guidelines mentioned in previous sections. The primary objectives with regard vegetation management within these facilities are maintenance the functionality in terms of the designed volume of retention and water flow, and the maintenance of the surrounding fence.
- Trees and brush should be cleared along both sides of the perimeter fencing for a width of approximately 8 feet as needed.
- Inlets and outfalls should be kept clear of vegetation and debris.

3.5.2. Locations
- Storm water management facilities, along with notes describing general maintenance requirements for each location can be referenced using a web base map viewer application at: IVM Map Viewer. Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

3.6. Wetland Mitigation Sites

3.6.1. Guidelines
- Wetland mitigation sites are carefully monitored through WSDOT’s Environmental Services Office for up to 10 years following their creation to ensure compliance with environmental regulations.
- In most cases vegetation in these sites is planted and established through the construction process so the maintenance actions are not required unless noxious weeds or hazardous trees become an issue.

3.6.2. Locations
- All wetland mitigation sites within Olympic Region, Area 4 along with notes describing dates constructed and permit requirements for each location can be referenced using a web base map viewer application at: IVM Map Viewer.
Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

3.7. Protected Terrestrial Species

3.7.1. Guidelines
- WSDOT is currently working with the Department of Fish and Wildlife to identify highway locations where known populations of federally listed threatened and endangered terrestrial species exist on or near the highway right-of-way. These locations are then being matched against maintenance activities with potential to have adverse impacts on the protected species so that necessary maintenance activities can timed to avoid impacts wherever possible.
- Methods and timing of roadside maintenance activities to avoid impacts on protected terrestrial species are described in the Region Maintenance Environmental Compliance Guidance for Protected Terrestrial Species.

3.7.2. Locations
- Once locations and guidelines have been finalized in the region compliance guide, locations and descriptions of limitations on vegetation maintenance activities will be added to a web base map viewer application at: IVM Map Viewer
- Data and locations represented on this map are for general reference and planning purposes only and are subject to change without notice. WSDOT cannot guarantee complete accuracy.

3.8. IVM Treatment Sites

3.8.1. Guidelines
- As discussed in Section 2.1, selected sites are designated for planning, carrying out and monitoring multi-year IVM treatments for control of weeds or other unwanted vegetation.
- IVM treatment sites are documented with an initial record in the IVM Treatment Database, to identify the problem to be addressed, location(s), management goals, and integrated treatment plan.
- Records are updated each time a treatment is made, results observed, or when the treatment plan is modified based on observations.

3.8.2. Locations
- All designated IVM treatment sites within Olympic Region, Area 4 are documented with a treatment/evaluation form which can be found in the pesticide application database.
# Appendix A

## IVM Prescriptions

### Zone 1 Maintenance - Bareground Treatment

<table>
<thead>
<tr>
<th>OPTION 1</th>
<th>OPTION 2</th>
<th>OPTION 3</th>
<th>OPTION 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREATMENT TYPE:</strong></td>
<td>Pavement Edge</td>
<td>Pavement Edge</td>
<td>Pavement Edge</td>
</tr>
<tr>
<td><strong>MANAGEMENT GOALS:</strong></td>
<td>Vegetation free</td>
<td>Vegetation free</td>
<td>Vegetation free</td>
</tr>
<tr>
<td><strong>METHOD:</strong></td>
<td>Annual herbicide application</td>
<td>Annual herbicide application</td>
<td>Annual herbicide application</td>
</tr>
<tr>
<td><strong>EQUIPMENT:</strong></td>
<td>Spray truck w/ boom mounted nozzles</td>
<td>Spray truck w/ boom mounted nozzles</td>
<td>Spray truck w/ boom mounted nozzles</td>
</tr>
<tr>
<td><strong>MATERIALS:</strong></td>
<td>Frequency 4 oz./acre + Sulfomet 3 oz./acre + Aquaneat 48 oz./acre</td>
<td>Aquaneat 48 oz./acre + Landmark 4.5 oz./acre +</td>
<td>Aquaneat 48 oz./acre</td>
</tr>
<tr>
<td><strong>TIMING:</strong></td>
<td>Spring</td>
<td>Spring</td>
<td>Spring</td>
</tr>
<tr>
<td><strong>IVM FOLLOW-UP:</strong></td>
<td>Evaluate control</td>
<td>Evaluate control</td>
<td>Evaluate control</td>
</tr>
<tr>
<td><strong>REMARKS:</strong></td>
<td>Typically applied in a 2 to 3 ft. band.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix A

### IVM Prescriptions

#### Zone 2 Maintenance - Tree and Brush

<table>
<thead>
<tr>
<th>OPTION 1</th>
<th>OPTION 2</th>
<th>OPTION 3</th>
<th>OPTION 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREATMENT TYPE:</strong></td>
<td>Tree &amp; Brush</td>
<td>Tree &amp; Brush</td>
<td>Tree &amp; Brush</td>
</tr>
<tr>
<td><strong>MANAGEMENT GOALS:</strong></td>
<td>Control vegetation obstruction</td>
<td>Control vegetation obstruction</td>
<td>Control vegetation obstruction</td>
</tr>
<tr>
<td><strong>METHOD:</strong></td>
<td>Herbicide treatment</td>
<td>Herbicide treatment</td>
<td>Herbicide treatment</td>
</tr>
<tr>
<td><strong>EQUIPMENT:</strong></td>
<td>1/2 Gallon Pump Jug or Backpack sprayer</td>
<td>Spray truck w/ handgun</td>
<td>Sidearm mower w / wet blade</td>
</tr>
<tr>
<td><strong>MATERIALS:</strong></td>
<td>Element 3A 64ozl./acre + Metcel VMF 2ozl./acre</td>
<td>Element 3A 32ozl./acre + Metcel VMF 1 ozd./acre + Milestone 6 ozl./acre</td>
<td>Element 3A 64ozl./acre</td>
</tr>
<tr>
<td><strong>TIMING:</strong></td>
<td>Mid to late Summer</td>
<td>Mid to late Summer</td>
<td>Mid to late Summer</td>
</tr>
<tr>
<td><strong>IVM FOLLOW-UP:</strong></td>
<td>Evaluate control</td>
<td>Evaluate control</td>
<td>Evaluate control</td>
</tr>
<tr>
<td><strong>REMARKS:</strong></td>
<td>Avoid brown out by spraying late in the season and spray only to appropriate height.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Noxious and Nuisance Weed Control - General

<table>
<thead>
<tr>
<th>OPTION 1</th>
<th>OPTION 2</th>
<th>OPTION 3</th>
<th>OPTION 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TREATMENT TYPE:</strong></td>
<td>Chemical application</td>
<td>Chemical application</td>
<td>Chemical application</td>
</tr>
<tr>
<td><strong>ACTION THRESHOLD:</strong></td>
<td>As soon as plants appear.</td>
<td>As soon as plants appear.</td>
<td>As soon as plants appear.</td>
</tr>
<tr>
<td><strong>MANAGEMENT GOALS:</strong></td>
<td>Eradication and control if required by county.</td>
<td>Eradication and control if required by county.</td>
<td>Eradication and control if required by county.</td>
</tr>
<tr>
<td><strong>METHOD:</strong></td>
<td>Spot treatment w/herbicide</td>
<td>Spot treatment w/herbicide</td>
<td>Spot treatment w/herbicide</td>
</tr>
<tr>
<td><strong>EQUIPMENT:</strong></td>
<td>Handgun</td>
<td>Handgun</td>
<td>Brown Mower, Sidearm Mower Handgun, Dauber</td>
</tr>
<tr>
<td><strong>MATERIALS:</strong></td>
<td>Element 3A 32ozl./acre + Milestone 6 ozl./acre + Metcel VMF1 ozl./acre</td>
<td>Element 3A 64ozl./acre + Milestone 7ozl./acre</td>
<td>Element 3A 64ozl./acre</td>
</tr>
<tr>
<td><strong>TIMING:</strong></td>
<td>Growing Season</td>
<td>Growing Season</td>
<td>Growing Season</td>
</tr>
<tr>
<td><strong>IVM FOLLOW-UP:</strong></td>
<td>Reapply as necessary. Seed and fertilize to reduce weed competition.</td>
<td>Reapply as necessary. Seed and fertilize to reduce weed competition.</td>
<td>Repeat as necessary. Seed and fertilize to reduce weed competition.</td>
</tr>
<tr>
<td><strong>REMARKS:</strong></td>
<td>Option 1: Thistle, Tansy, Knapweed</td>
<td>Option 2: Shinny Leaf Geranium, Spurge Laurel</td>
<td>Option 3: Scotch Broom, Blackberries</td>
</tr>
</tbody>
</table>
### Herbicides Approved for Use on WSDOT Rights of Way

When making herbicide applications:
1. Always read and follow product labels
2. Always use personal protective equipment when mixing, loading, and applying

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Product Names</th>
<th>Mode of Action (WSSA Class)</th>
<th>Where Used</th>
<th>How/Why Used</th>
<th>Notes/ Recommendations</th>
<th>WSDOT Restrictions</th>
<th>Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>Agri Star 2, 4-D LV4, Basecamp Amine 4, Clean Amine, Crossbow, Curtail, ES, Escalade, Low Vol 4 Ester, Platoon, Rangestar, Savage, Solution, Veteran 720, Weedar 64, WeedDestroy, Weedmaster, Weedone LV4</td>
<td>Growth regulator - phenoxy synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Ester and acid formulations of 2,4-D may provide a good alternative to amine formulations. A number of the 2,4-D products come premixed with other herbicides.</td>
<td>Amine formulations of 2,4-D are restricted for use within 60’ of all water</td>
<td>Amine formulations cause irreversible eye damage and are highly toxic to rainbow trout. All 2,4-D products pose risks when applied near grapes and other sensitive crops.</td>
</tr>
<tr>
<td>Aminocyclopyrachlor</td>
<td>Perspective Plainview, Streamline, Viewpoint</td>
<td>Growth regulator - mimics plant hormones, synthetic auxin (4)</td>
<td>Noxious and noxious weed control Zones 2 and 3, Plainview is a bare-ground mixture</td>
<td>Depending on which mixture, can be either selective broadleaf or non-selective pre-emergent control</td>
<td>Each product is premixed with other herbicide to achieve either selective or non-selective control</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>Refer to product labels</td>
</tr>
<tr>
<td>Aminopyralid</td>
<td>Milestone Milestone VM Milestone VM Plus Capstone</td>
<td>Growth regulator - mimics plant hormones, synthetic auxin (4)</td>
<td>Noxious and noxious weed control Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Effective on many perennial weed species due to some amount of soil residual activity on suppressing seed germination</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>Refer to product label</td>
</tr>
<tr>
<td>Bromacil</td>
<td>Krovar 1 DF Hyvar</td>
<td>Photosynthetic inhibitor - photosystem II, site A (5)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent grass and weed control</td>
<td>Krovar is premixed with diuron</td>
<td>Westside - Restricted use Eastside - Krovar restricted for use within 60’ of all water</td>
<td>Bromacil is potentially mobile in soil, use caution if rain is possible.</td>
</tr>
<tr>
<td>Bromoxynil</td>
<td>Buctril 2EC BroClean Brox 2E Maestro 2EC</td>
<td>Photosynthetic inhibitor - photosystem II, site C (6)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Effective broadleaf weed control without grass seed suppression</td>
<td>Westside - Restricted use Eastside - Restricted for use within 60’ of all water</td>
<td>Can cause irreversible eye damage, highly toxic to fresh water fish.</td>
</tr>
<tr>
<td>Chlorsulfuron</td>
<td>Telar XP Landmark XP Throttle XP Perspective</td>
<td>Amino acid synthesis inhibitors - ALS inhibitor (2)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Product highly effective on difficult perennials such as Canadian thistle and horsetail. Landmark is premixed with Oust.</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>Refer to product labels</td>
</tr>
<tr>
<td>Clopyralid</td>
<td>Transline Curtail</td>
<td>Growth regulator - pyridinecarboxylic acid synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Curtail is premixed with 2,4-D, Pathfinder is premixed with triclopyr</td>
<td>Curtail and Pathfinder are restricted for use within 60’ of all water because of mixture with other restricted herbicides.</td>
<td>Curtail contains 2,4-D amine which causes irreversible eye damage and is highly toxic to rainbow trout.</td>
</tr>
</tbody>
</table>
### Herbicide Guidelines

**Herbicides Approved for Use on WSDOT Rights of Way**

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1. Always read and follow product labels
2. Always use personal protective equipment when mixing, loading, and applying

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Product Names</th>
<th>Mode of Action (WSSA Class)</th>
<th>Where Used</th>
<th>How/Why Used</th>
<th>Notes/Recommendations</th>
<th>WSDOT Restrictions</th>
<th>Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dicamba</td>
<td>Vanquish</td>
<td>Growth regulator - benzoic acids/synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Vanquish is the dicamba formulation without 2,4-D</td>
<td>Veteran 720 is restricted for use within 60’ of all water because of 2,4-D amine content</td>
<td>Veteran 720 contains 2-4-D amine which causes irreversible eye damage and is highly toxic to rainbow trout</td>
</tr>
<tr>
<td>Dichlobenil</td>
<td>Norosac 4G</td>
<td>Cell wall (cellulose) synthesis inhibitor (20)</td>
<td>Ornamental planting beds</td>
<td>Pre-emergent weed control in ground cover beds. Post emergent control of grasses.</td>
<td>Highly effective for pre-emergent control of unwanted weeds in ornamentals</td>
<td>Restricted for use within 60’ of all water</td>
<td>Dichlobenil is highly toxic to aquatic insects</td>
</tr>
<tr>
<td>Diflufenpyr</td>
<td>Overdrive</td>
<td>Auxin transport inhibitor (19)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td></td>
<td>No WSDOT use restrictions beyond those specified on labels</td>
<td>Refer to product label</td>
</tr>
<tr>
<td>Diuron</td>
<td>Karmex</td>
<td>Photosynthetic inhibitor, photosystem II, site B (7)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent grass and weed control</td>
<td>Cost effective weed control for Zone 1 in Eastern Washington</td>
<td>Westside - Restricted use Eastside - Restricted for use within 60’ of all water</td>
<td>Highly toxic to fish.</td>
</tr>
<tr>
<td>Flumioxazin</td>
<td>Payload</td>
<td>Cell membrane disrupter - PPO inhibitor (14)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent weed control</td>
<td>Requires constant agitation to keep in suspension</td>
<td>Restricted for use within 60’ of all salt water</td>
<td>Highly toxic to estuarine invertebrates</td>
</tr>
<tr>
<td>Fluroxypyr</td>
<td>Vista E2</td>
<td>Growth regulator - pyridinecarboxylic acid synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Highly effective on Kochia</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>Highly toxic to Eastern Oyster, high surface runoff potential</td>
</tr>
<tr>
<td>Fosamine</td>
<td>Krenite S</td>
<td>Growth regulator - inhibits bud and leaf formation (27)</td>
<td>Tree and brush control in Zones 2 &amp; 3</td>
<td>Selective broadleaf treatment</td>
<td>Effective broadleaf tree control without visual impacts</td>
<td>No WSDOT use restrictions beyond those specified on labels</td>
<td>Refer to product label</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Roundup Pro</td>
<td>Amino acid synthesis inhibitor - EPSP synthase inhibitor (9)</td>
<td>Zone 1, spot spray around shrub and tree plantings, aquatic weed control (Rodeo, Aquamaster)</td>
<td>Nonselective control of all vegetation</td>
<td>Rodeo, Aquamaster and Aquaneat are approved for use in or over water. Aquatic versions of glyphosate products are approved for use with NPDES permit.</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>Refer to product label</td>
</tr>
</tbody>
</table>

*Olympic Region, Area 4
Integrated Roadside Vegetation Management Plan*
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<tr>
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<th>Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imazapic</td>
<td>Plateau</td>
<td>Amino acid synthesis inhibitors - ALS inhibitor (2)</td>
<td>All zones</td>
<td>Pre-emergent control of undesirable grasses</td>
<td>WSDOT tests plots show a significant impact on desirable perennial grasses at rates above 6 oz per acre.</td>
<td>Westside - Restricted use Eastside - Restricted for use within 60' of all water</td>
<td>Moderate to high potential to leach into groundwater</td>
</tr>
<tr>
<td>Imazapyr</td>
<td>Arsenal Habitat Polaris Sahara DG Imazuron</td>
<td>Amino acid synthesis inhibitors - ALS inhibitor (2)</td>
<td>All zones</td>
<td>Pre and post-emergent non-selective control of all vegetation</td>
<td>Habitat is an aquatic version of Arsenal - good alternative to glyphosate in certain cases, approved for use with NPDES permit.</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>High surface runoff potential</td>
</tr>
<tr>
<td>Indaziflam</td>
<td>Esplanade</td>
<td>Cellulose-biosynthesis inhibitor (21)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent weed control</td>
<td>Effective control of annual weeds such as marestail, Kochia, and crabgrass</td>
<td>Restricted for use within 60' of all water</td>
<td>Toxic to fish and aquatic invertebrates</td>
</tr>
<tr>
<td>Isoxaben</td>
<td>Gallery 75DF</td>
<td>Cell wall (cellulose) synthesis inhibitor (20)</td>
<td>Turf &amp; Ornamental</td>
<td>Pre-emergent weed control in ground cover beds</td>
<td>Works well by itself or with Ronstar</td>
<td>Restricted for use within 60' of all water</td>
<td>Moderate to high potential to leach into groundwater</td>
</tr>
<tr>
<td>Metsulfuron-methyl</td>
<td>Escort XP Metsulfuron Methyl 60 DF MetCel VMF Streamline</td>
<td>Amino acid synthesis inhibitors - ALS inhibitor (2)</td>
<td>Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3</td>
<td>Selective broadleaf and conifer treatment</td>
<td>Good control on many difficult perennials.</td>
<td>No WSDOT use restrictions beyond those specified on product labels</td>
<td>Refer to product labels</td>
</tr>
<tr>
<td>Norflurazon</td>
<td>Predict</td>
<td>Bleaching - carotenoid biosynthesis inhibitor (12)</td>
<td>Zone 1 bare-ground</td>
<td>Pre-emergent weed control in Zone 1 and ground cover beds</td>
<td>Good Zone 1 product but may be difficult to keep in suspension</td>
<td>Restricted for use within 60' of all water</td>
<td>High surface runoff potential</td>
</tr>
<tr>
<td>Oryzalin</td>
<td>Oryzalin A.S. Surfan A.S</td>
<td>Seedling growth inhibitor - microtubule assembly inhibitor (3)</td>
<td>Zone 1 Ornamental planting beds</td>
<td>Pre-emergent weed control in Zone 1 and ground cover beds</td>
<td>Product requires additional rinsing to thoroughly remove residues from empty container</td>
<td>Restricted for use within 60' of all water</td>
<td>Highly toxic to fish</td>
</tr>
<tr>
<td>Oxadiazon</td>
<td>Ronstar G Ronstar WSP</td>
<td>Cell membrane disrupter - PPO inhibitor (14)</td>
<td>Turf &amp; Ornamental</td>
<td>Pre-emergent weed control in ground cover beds</td>
<td>Works well by itself or with Gallery</td>
<td>Restricted for use within 60' of all water, gardens, plants bearing edible fruit</td>
<td>Highly toxic to fish</td>
</tr>
<tr>
<td>Pendimethalin</td>
<td>Pendulum 2G Pendulum Aqua</td>
<td>Seedling growth inhibitor - microtubule assembly inhibitor (3)</td>
<td>Zone 1</td>
<td>Nonselective/Selective depending on rate, Pre-emergent grass and weed control</td>
<td></td>
<td>Westside - Restricted use Eastside - Restricted for use within 60' of all water</td>
<td>Highly toxic to fish, high potential for loss on eroded soil</td>
</tr>
<tr>
<td>Picloram</td>
<td>Tordon</td>
<td>Growth regulator - pyridinocarboxylic acid synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Highly effective for conifer and broadleaf weed control in Eastern Washington</td>
<td>Westside - Restricted use Eastside - Restricted for use within 60' of all water</td>
<td>Highly mobile in soil and readily absorbed through roots of desirable trees</td>
</tr>
<tr>
<td>Pyraflufen</td>
<td>Edict Edict 2SC</td>
<td>Cell membrane disrupter - PPO inhibitor (14)</td>
<td>Noxious and nuisance weed control, Zones 2 and 3</td>
<td>2,4-D substitute, effective on Kochia, Russian thistle</td>
<td>Effective with Roundup for Kochia control</td>
<td>Restricted for use within 60' of all water</td>
<td>Irreversible eye damage, highly toxic to Rainbow Trout</td>
</tr>
</tbody>
</table>
## Appendix B

### Herbicide Guidelines

#### Herbicides Approved for Use on WSDOT Rights of Way

When making herbicide applications:
1. Always read and follow product labels
2. Always use personal protective equipment when mixing, loading, and applying

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Product Names</th>
<th>Mode of Action (WSSA Class)</th>
<th>Where Used</th>
<th>How/Why Used</th>
<th>Notes/Recommendations</th>
<th>WSDOT Restrictions</th>
<th>Cautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfentrazone</td>
<td>Portfolio Throttle XP</td>
<td>Cell membrane disrupter - PPO inhibitor (14)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent grass and weed control</td>
<td>Use caution in sandy soils</td>
<td>Westside - Restricted use Eastside - Restricted for use within 60' of all water</td>
<td>High surface runoff potential, potentially mobile in soil if rain is possible.</td>
</tr>
<tr>
<td>Sulfometuron-methyl</td>
<td>Oust Landmark XP Throttle XP</td>
<td>Amino acid synthesis inhibitors - ALS inhibitor (2)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre/post emergent grass and weed control</td>
<td>Landmark is a premix with Oust and Telar</td>
<td>Refer to product labels</td>
<td>Oust has been proven to move with wind if not watered in to the ground</td>
</tr>
<tr>
<td>Tebuthiuron</td>
<td>Spike 80DF</td>
<td>Photosynthetic inhibitor photosystem II, site B (7)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent grass and weed control</td>
<td>Refer to product label</td>
<td>Refer to product label</td>
<td>Westside - Restricted use Eastside - Restricted for use within 60' of all water</td>
</tr>
<tr>
<td>Topramezone</td>
<td>Frequency</td>
<td>Bleaching - carotenoid biosynthesis inhibitor (12)</td>
<td>Zone 1 bare-ground</td>
<td>Nonselective pre-emergent grass and weed control</td>
<td>Use in combination with another bare-ground chemical</td>
<td>Refer to product label</td>
<td>Refer to product label</td>
</tr>
<tr>
<td>Triclopyr Amine</td>
<td>Capstone, Element 3A, Garlon 3A, Milestone VM Plus</td>
<td>Growth regulator - pyridinecarboxylic acid synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Works well for scotch broom control</td>
<td>Refer to product label</td>
<td>Can cause irreversible eye damage</td>
</tr>
<tr>
<td>Triclopyr Ester</td>
<td>Crossbow, Crossbow L, Element 4, Garlon, Pathfinder</td>
<td>Growth regulator - pyridinecarboxylic acid synthetic auxin (4)</td>
<td>Noxious and nuisance weed control, and tree and brush control, Zones 2 and 3</td>
<td>Selective broadleaf treatment</td>
<td>Works well for cut-stump or basal treatments applications. Crossbow is premixed with 2,4-D, Pathfinder with clopyralid</td>
<td>Restricted for use within 60' of all water</td>
<td>Highly toxic to fish</td>
</tr>
</tbody>
</table>
Appendix C  Noxious Weed Identification

Designated for control in OL area 4:
(Grays Harbor, Mason, and Thurston County)

- Tansy Ragwort/ *Senecio jacobaea*
- Wild Chervil/ *Anthriscus sylvestris*
- Knapweed sp./ *Cenaurea sp.*
- Gorse/ *Ulex europaeus*
- Purple Loosestrife/ *Lythrum salicaria*
- Orange Hawkweed/ *Hieracium aurantiacum*
Designated for Control in OL area 4:
(Grays Harbor, Mason, and Thurston County)

Knotweed sp./
Polygonum
Nuisance weeds in OL area 4:
(Grays Harbor, Mason, and Thurston County)

Butterfly Bush/ *Buddleha davidii*

Poison Hemlock/ *Conium maculatum*

St. Johnswort./ *Hypericum perforatum*

Common Tansy/ *Tanacetum Vulgare*

Bull Thistle/ *Cirsium vulgare*

Canada Thistle/ *Cirsium arvense*
Nuisance weeds in OL area 4:
(Grays Harbor, Mason, and Thurston County)

Scotch Broom/
*Cytisus scoparius*

Wild Carrot/
*Daucus carota*

Himalayan Blackberry/
*Rubus discolor*

Common Mullein/
*Verbascum thapsus*
### Integrated Vegetation Management Record

**Org Code**: 435420  
**County**: Grays Harbor  
**Date**: 8/7/2006

<table>
<thead>
<tr>
<th>Area</th>
<th>SE</th>
<th>MP 104</th>
<th>MP 137</th>
<th>Location</th>
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<tr>
<td>_____</td>
<td>----</td>
<td>--------</td>
<td>--------</td>
<td>----------</td>
</tr>
</tbody>
</table>

#### Check Appropriate Boxes:
- ❑ Roadside
- ❑ Shoulder
- ❑ Rest Area
- ❑ Bridge
- ❑ Stormwater
- ❑ Yard/Stockpile
- ❑ Mitigation Site
- ❑ Third Party Damage
- ❑ Sensitive Sites
- ❑ Yes
- ❑ No

**Target Areas**:
- ☑ Noxious Weeds
- ☑ Brush/Tree
- ☑ Other
- ❑ Nuisance Weeds
- ❑ Harmful Tree

**List Target Species**:
- Orange Hawkweed

**Reason for Action**:
- ☑ Noxious Weeds
- ☑ Nuisance Weeds
- ☑ Fire Prevention
- ☑ Restore Native Veg.
- ☑ Zone 1 Pilot
- ☑ Aesthetic
- ☑ Site Distance
- ☑ Hazards Vegetation
- ☑ Customer Request
- ☑ Balance Vegetation
- ☑ Slope Stabilization
- ☑ Other

**Long term IVIM plan** (Describe goals/objectives and a step-by-step approach over time)

To control and eradicate this weed from zones 1 & 2. This was the first treatment this year but we are seeing good results from the previous treatments from the year before.

**Approximate Acres to Accomplish**: 1.5

<table>
<thead>
<tr>
<th>Activities</th>
<th>Planned date of Treatment</th>
<th>Actual date of Treatment</th>
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<tbody>
<tr>
<td>Manual</td>
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<tr>
<td></td>
<td>Dugging</td>
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<td>Plowing</td>
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<tr>
<td></td>
<td>Planting</td>
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<tr>
<td>Mechanical</td>
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<td></td>
<td>Axial Saw Work</td>
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<td>Mechanical Saw Cutting</td>
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<td>Mechanical Mower</td>
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<td>Bi-Cultural</td>
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<td>Insecticides</td>
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<td>Revitalizing</td>
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<td>Sealing</td>
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<td>Soil Amendment</td>
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<td></td>
<td>Other</td>
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</table>

**Chemical**
- 3119456
- Record Number: 8/7/2006

#### #1 Evaluation and Date

#### #2 Evaluation and Date

#### #3 Evaluation and Date
# Pesticide Application

## Form 8420: Integrated Roadside Vegetation Management Plan 2014

**Start Weather Conditions**
- Temperature: 54°F
- Wind (Direction From): NW
- Wind (Range): 2 mph

**Finish Weather Conditions**
- Temperature: 60°F
- Wind (Direction From): NW
- Wind (Range): 4 mph

<table>
<thead>
<tr>
<th>Task</th>
<th>Material Name</th>
<th>Material Type</th>
<th>EPA Reg. No.</th>
<th>Lot Number</th>
<th>Product Use (Acres/Day)</th>
<th>Unit</th>
<th>Total Daily Usage Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water</td>
<td>Carrier</td>
<td></td>
<td>Spokane St.</td>
<td>100 Gal</td>
<td>50 Gal</td>
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<tr>
<td>1</td>
<td>Aquamariner</td>
<td>Pesticide</td>
<td>524-343</td>
<td>MTR00805AJ</td>
<td>96 Ozl</td>
<td>48 Ozl</td>
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<tr>
<td>1</td>
<td>MSO</td>
<td>Adjuvant</td>
<td></td>
<td>77562</td>
<td>32 Ozl</td>
<td>16 Ozl</td>
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<tr>
<td>1</td>
<td>Turf Trax</td>
<td>Adjuvant</td>
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<td>34294</td>
<td>32 Ozl</td>
<td>16 Ozl</td>
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</table>

**Total:** 0.50 Acres (0.20 hectares) Treated.

**Spraying Information**
- Equipment: 21A36-5
- Task Size: 1
- Collection Date: 09/25/2006
- Vehicle Speed: 5
- Vehicle (fps): 3
- Width of Spray Pattern: N/A

**Operator Information**
- Operator Name: Gabriel Olivas
- Operator License No.: 52698
- Operator Signature: [Signature]
- Driver Name: Richard Blair
- Buffer Truck Driver’s Name: [Name]
- Pesticide Sensitivity Registration: [Yes/No]
- Comments: No water was present at the time of spray.

**Division of Emergency Management (1-800-258-5990)**

---

Olympic Region, Area 4  Integrated Roadside Vegetation Management Plan 2014
## Appendix D
### Forms and Records

### Exhibit x

<table>
<thead>
<tr>
<th>PESTICIDE - USE PROPOSAL</th>
<th>DEPARTMENT/AGENCY</th>
<th>CONTACT/PHONE NO.</th>
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<td>(Reference FSM 2150)</td>
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<td>1) OBJECTIVE</td>
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<td>a) Project No.</td>
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<tr>
<td>b) Specific Target Pest</td>
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<td>c) Purpose</td>
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<td>2) PESTICIDE</td>
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<tr>
<td>a) Common Name</td>
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<tr>
<td>b) Formulation</td>
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</tr>
<tr>
<td>c) % AI,AE,or lb / Gal.</td>
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</tr>
<tr>
<td>d) Registration No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td></td>
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</tr>
<tr>
<td>a) Form Applied</td>
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</tr>
<tr>
<td>b) Use Strength (%) or Dilution Rate</td>
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<tr>
<td>c) Diluent</td>
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<td>4) lbs. AI Per Acre or Other Rate</td>
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<td>5) APPLICATION</td>
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<tr>
<td>a) Method</td>
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<tr>
<td>b) Equipment</td>
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</tr>
<tr>
<td>6)</td>
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<tr>
<td>a) Acres or Other Unit to be Treated</td>
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<tr>
<td>b) Number of Applications</td>
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<tr>
<td>c) Number of Sites</td>
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<tr>
<td>d) Specific Description of Sites</td>
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<td>7)</td>
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<td>a) Month(s) of Year</td>
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<td>b) States</td>
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<tr>
<td>8) SENSITIVE AREAS</td>
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<td>a) Areas to be Avoided</td>
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<td>b) Areas to be Treated with Caution</td>
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<tr>
<td>9) REMARKS</td>
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<tr>
<td>a) Precautions to be Taken</td>
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<tr>
<td>b) Use of Trained / Certified Personnel</td>
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<tr>
<td>c) State and Local Coordination</td>
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<tr>
<td>d) Other Pesticides Being Applied to Same Site</td>
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<tr>
<td>e) Monitoring</td>
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</tr>
<tr>
<td>f) Other</td>
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</table>
## Appendix E  
### IVM Stakeholders List

<table>
<thead>
<tr>
<th>Entity</th>
<th>Mailing Address</th>
<th>Contact Person</th>
<th>Title</th>
<th>Phone</th>
<th>E-Mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Aberdeen</td>
<td>200 East Market St. Aberdeen, WA 98520</td>
<td>Malcolm Bowie</td>
<td>Public Works Director</td>
<td>(360) 537-3228</td>
<td><a href="mailto:mbowie@aberdeenwa.gov">mbowie@aberdeenwa.gov</a></td>
</tr>
<tr>
<td>City of Hoquiam</td>
<td>609 8th Street Hoquiam, WA 98550</td>
<td>Brian Shay</td>
<td>City Administrator</td>
<td>(360) 538-3983</td>
<td><a href="mailto:bshay@cityofhoquiam.com">bshay@cityofhoquiam.com</a></td>
</tr>
<tr>
<td>City of Cosmopolis</td>
<td>PO Box 2007 Cosmopolis WA 98537</td>
<td>Darrin Rains</td>
<td>Public Works Director</td>
<td>(360) 533-4280</td>
<td><a href="mailto:drains@cosmopolis.us.com">drains@cosmopolis.us.com</a></td>
</tr>
<tr>
<td>City of Montesano</td>
<td>112 N Main St. Montesano, WA 98563</td>
<td>Rocky Howard</td>
<td>Public Works Director</td>
<td>(360) 249-3939</td>
<td><a href="mailto:rhoward@montesano.us">rhoward@montesano.us</a></td>
</tr>
<tr>
<td>City of Elma</td>
<td>202 W. Main St. Elma, WA 98541</td>
<td>Jim Starks</td>
<td>Public Works Director</td>
<td>(360) 482-2212</td>
<td><a href="mailto:jim@cityofelma.com">jim@cityofelma.com</a></td>
</tr>
<tr>
<td>City of McCleary</td>
<td>100 South 3rd St. McCleary, WA 98557</td>
<td>Todd Baum</td>
<td>Interim Public Works Director</td>
<td>(360) 495-3667</td>
<td><a href="mailto:nickb@cityofmccleary.com">nickb@cityofmccleary.com</a></td>
</tr>
<tr>
<td>City of Oakville</td>
<td>204 Maint St. E. Oakville, WA 98568</td>
<td>Dan Thompson</td>
<td>Public Works Director</td>
<td>(360) 273-3591</td>
<td><a href="mailto:oakvillecityhall@comcast.net">oakvillecityhall@comcast.net</a></td>
</tr>
<tr>
<td>City of Ocean Shores</td>
<td>710 Point Brown Ave. NE Ocean Shores, Wa 98569</td>
<td>Chrystal Dingler</td>
<td>Major/ acting Public Works Director</td>
<td>(360) 289-2754</td>
<td><a href="mailto:cdingler@osgov.com">cdingler@osgov.com</a></td>
</tr>
<tr>
<td>City of Westport</td>
<td>740 N. Montesano St. Westport, WA 98595</td>
<td>Randy Lewis</td>
<td>Public Works Director</td>
<td>(360) 268-0835</td>
<td><a href="mailto:public_works@ci.westport.wa.us">public_works@ci.westport.wa.us</a></td>
</tr>
<tr>
<td>Quinault Indian Reservation</td>
<td>807 5th. Ave. Taholah, WA 98587</td>
<td>Connie Wilson</td>
<td>Department Planning Manager</td>
<td>(360) 276-8215</td>
<td><a href="mailto:cwilson@quinault.org">cwilson@quinault.org</a></td>
</tr>
<tr>
<td>Olympic National Forest</td>
<td>353 South Shore Road Quinault, WA 98575</td>
<td>Nancy Patrick</td>
<td></td>
<td>(360) 288-2525</td>
<td><a href="mailto:mailroom_rs_olympic@fs.fed.us">mailroom_rs_olympic@fs.fed.us</a></td>
</tr>
<tr>
<td>Grays Harbor County</td>
<td>P.O. Box R Elma, WA</td>
<td>Nancy Ness</td>
<td>Weed Board Coordinator</td>
<td>(360) 482-2265</td>
<td><a href="mailto:nesan@cahnrs.wsu.edu">nesan@cahnrs.wsu.edu</a></td>
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<tr>
<td>Thurston County</td>
<td>11834 Tilley Rd. S Olympia, WA 98512</td>
<td>Rick Johnson</td>
<td>Weed Board Coordinator</td>
<td>(360) 786-5576</td>
<td><a href="mailto:tcweeds@co.thurston.wa.us">tcweeds@co.thurston.wa.us</a></td>
</tr>
</tbody>
</table>