Introduction

The Washington State Department of Transportation’s (WSDOT) Southwest Region Area 2 manages approximately 245 miles of state highway corridor throughout Lewis County. In addition to the Interstate 5 corridor, the area maintains US 12 up to the south entrance to Mt. Rainier National Park, State Routes (SR) 122, 505, 506, 508, and portions of SR 6 and 7. A map of the area is included as Figure 1 on the following page.

The primary roadside vegetation management objectives are in relation to traffic safety and preservation of the highway infrastructure. Additionally as a landowner WSDOT is required to control all listed noxious weeds that occur on the right-of-way by state law (RCW 17.10 and 15.15.010). It is important that WSDOT not only meet the legal requirements for weed control, but also consider the needs and concerns of adjacent landowners in this area.

In order to best manage roadsides with these priority objectives in mind, WSDOT practices an annually cycling process called Integrated Vegetation Management (IVM). Plans like this are maintained and updated annually for all areas of the state with an overall goal of establishing the most naturally self-sustaining roadsides vegetation possible. Adjustments are made year to year in each area plan based on monitoring the previous years’ accomplishments and results, available budget, and prioritization of other highway maintenance activities.

This plan serves as the guidance document for vegetation maintenance in Southwest Region Area 2 for the 2017 growing season. It provides a general description of the area work plan, and includes treatment prescriptions for accomplishing safety and prioritized weed control objectives through the use of a combination of seasonally-timed control measures. Each year’s actions are designed as part of a coordinated multi-year strategy to efficiently maintain traffic safety and comply with weed control laws on all state roadsides, and working within budget, to invest in restoring a set of selected priority locations to a stable self-sustaining native condition. This plan also accounts for specific locations where maintenance tactics are adjusted due to environmental issues, neighboring properties, local partnerships, or restoration work done through WSDOT design and construction.

The information contained in this plan document is referenced and utilized by crews in the field using iPads and the Highway Activity Tracking System (HATS). Accomplishments and results are also tracked and referenced through this system, as part of the budget planning and maintenance accountability process. Carrying iPads in the field also gives maintenance crews the ability to reference a wide range of technical information and alerts for locations with environmental sensitivity or special agreements with neighbors.

WSDOT welcomes input from local public and private entities on its weed control and other vegetation management activities. Wherever appropriate the agency is looking for opportunities to plan and cooperate with others in managing the roadside. Please direct any questions, comments or suggestions to the Southwest Region Area 2 Superintendent – Scott Wilcox, or the State’s Roadside Asset Manager – Ray Willard.

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Southwest Region, Area 2 IVM Work Plan – 2017

This is an outline of the overall approach and geographic distribution of roadside vegetation management requirements throughout the maintenance area in 2017. Information is organized in relation to three groups of activities defined in the WSDOT Maintenance Accountability Program (MAP) for the performance of roadside vegetation maintenance activities: **Control of Vegetative Obstructions**, **Noxious Weed Control**, and **Nuisance Weed Control**. Specific locations as noted in this work plan are also mapped in the Highway Activity Tracking System (HATS) for reference by maintenance in the field.

**Control of Vegetative Obstructions – MAP Activity 3A4**
The work of this group of maintenance activities relates to the safety and operational requirements of the highway. These items are considered first priority in terms of the overall roadside maintenance needs. Vegetation management objectives and work activities in this category fall into four groups – **Pavement Edge Maintenance/Zone 1**, **Safety Mowing/Zone 2**, **Tree and Brush Control/Zone 2 and 3** and **Hazard Tree Removal/Zone 3**.

**Pavement Edge Maintenance/Zone 1**
**Work Operation:** 1615  
**HATS Form:** Spray Zone 1  
**HATS Map Layer:** Reference lines – Roadside Features/Spray Zone 1 Reference

This work includes the application of herbicides to road shoulders where necessary throughout the area. The objective of these applications in designated locations is preserving a band of gravel shoulder adjacent to the pavement that is free of vegetation. This treatment is necessary in the mapped locations described below to provide visibility and maintainability of roadside hardware and guideposts, allow room for vehicles to safely pull off on shoulders, facilitate stormwater drainage, and/or provide added visibility of wildlife approaching the highway.

**Total Units of Planned Treatment**

- Apply approximately **300 acres** of herbicide treatment to all road shoulders in the area.

**Locations of Planned Treatments**

- Planned treatment sites are being mapped in HATS layer – **Zone 1 Spray**.
- All gravel shoulders throughout the area will be treated annually with non-selective, soil residual herbicides.
- Road shoulders within Gifford Pinchot National Forest on SR12 will be treated with a mixture of products approved by USFS.
- I-5 Median, MP 61.27-71 will be treated full width
- Cracks in the paved median of I-5 MP 73-85.5 NB&SB will be treated with glyphosate only after other shoulder spraying is complete.

**Treatment Methods**

- For typical applications, spray equipment will be set to deliver a 3 ft. band of spray on a flat surface adjacent to the spray truck. For treatment around guardrail base and where wider bare ground is required, a second set of nozzles may be activated to deliver a 4 ft. band on a flat surface adjacent to the truck. For median on I-5 as specified the boom will be calibrated for a 12 ft. band.
- Actual width of treatment on shoulders will vary depending on the steepness of the slope away from pavement.
- Most locations will be treated in mid to late spring with the following mixture of herbicides and adjuvants:
  - 48 ozl/acre Roundup Pro
  - 5 ozl/acre Espleinade
  - 4 ozl/acre Milestone
- 16 oz/acre Insist 90
- Telar @ 2 oz. will be added to the mix where horsetail is present (approximately 93 miles of shoulders)

- SR12 MP (GPNF)
  - 48 oz/acre Roundup Pro
  - 14 oz/acre Polaris
  - 8 oz/acre In Place

**Safety Mowing/Zone 2**
**Work Operation:** 1625
**HATS Form:** Mowing Zone 2
**HATS Map Layer:** Reference lines – Roadside Features/Mowing Zone 2 Reference

This work includes routine mechanical cutting of all vegetation on the road shoulder in a band width immediately adjacent to pavement. Mowing is necessary in areas where taller growing grasses or other vegetation are present and must be annually or semi-annually cut back for visibility and maintenance of roadside hardware and delineators, to maintenance traffic sight distance at curves and intersections, and for improved visibility of wildlife approaching the highway. Mowing height for these operations is typically 6 to 8 inches above the ground.

**Total Units of Planned Treatment**
- Approximately **400 acres** will be mowed along the pavement edge throughout the area

**Locations of Planned Treatments**
- All shoulders area-wide will be mowed one pass between 8 and 24 ft. wide as needed. Except as noted:
  - SR507 NO zone 2 mowing needed
  - SR506 MP 1-11.53 NO zone 2 mowing needed

**Treatment Methods**
- Mowing along I-5 and parts of SR12 will be accomplished with a three deck, 24 ft. total width mower. However, typical mowing width is 8 to 16 ft. or as narrow as appropriate in areas with established stands of low growing grasses. The third mowing deck will only be used if the added mowing width is needed as part of IVM treatments from weeds or encroaching tree and brush.
- Mowing along secondary two lane routes will be accomplished with a single deck, drop down side mounted mower, or an arm mounted mower. Typical mowing width is 4 to 6 ft. but may be widened out in some areas for added traffic visibility.

**Tree and Brush Control/Zone 2 and 3**
**Work Operations:** 1622, 1625, 1626
**HATS Other Forms:** 4 sub-forms under Tree/Brush Control – Spray, Trimming Mechanical, Trimming Manual, and Mowing
**HATS Map Layer:** None

This includes work in Zone 2 such as periodic trimming or removal of brush and trees encroaching on traffic operations and visibility. Also included is work in Zone 2 and 3 when controlling emergent undesirable tree species to prevent them from growing into hazard trees.

**Total Units of Planned Treatment**
- Approximately **100 acres** will be controlled throughout the area, with either mechanical or chemical methods.

**Locations of Planned Treatments**
- SR6 MP 43-45 brushing trees in last 2 weeks of March to first 2 weeks in April
- SR506 MP 43-45 spray & cut and stump treat volunteer maple and alders that are close to the road and under the power lines.
- Overhanging and encroaching branches will be mechanically trimmed when time allows.
- Cut emerging seedling trees and brush from slopes with mechanical arm mower throughout the year when time allows.

**Treatment Methods**

- A tractor with arm mounted trimming head will be used to accomplish the majority of this work from the road shoulder with selective trimming/hedging of side branches and some mowing of unwanted vegetation to the ground.
- In some cases a lift with hand tools will be used to remove overhanging branches.
- For emergent traffic visibility problems resulting from spring growth, hand held string trimmers and cutting tools may be used to address select locations. In these locations, once vegetation has been cut, the mowed areas will be followed up with glyphosate products to eliminate grow back.
- Whenever possible cut stump surfaces on unwanted vegetation will be treated with herbicide either immediately following cutting or as a foliar application when grow back occurs later in the season, or the following year.
- Late season chemical controls will be applied as time and weather permit. Herbicides used:
  - Alder and Blackberry:
    - Krenite S @ 356 oz/acre
  - Other brush and small conifers:
    - Garlon 3A @ 128 oz/acre

**Hazard Tree Removal/Zone 3**

**Work Operation:** 1628

**HATS Forms:** Hazard Tree Removal – Individual Tree Removal, Stand Removal, and Cleanup Fallen Trees

**HATS Map Layer:** None

Trees within and adjacent to the right of way are routinely monitored by maintenance staff for potential risk to the highway and/or neighboring structures. Individual and stands of mature trees identified as a potential imminent threat will be further evaluated and removed as soon as possible where needed. Blow down from “non-disaster” events must also be removed from the road.

**Total Units of Planned Treatment**

- Approximately **800 mature hazard trees**, possibly more, are removed throughout the area each year.

**Locations of Planned Treatments**

- The entire area will be evaluated and prioritized for hazard tree removal annually.

**Treatment Methods**

- Crews are continuously looking for trees that exhibit structural defects and could strike the road or neighboring property if they come down. Any potential hazard trees identified will be further evaluated and removed as soon as possible if necessary.
- If trees growing outside WSDOT right of way are hazards, crews work with the neighboring property owner to negotiate removal.
- Whenever possible removal debris will be left to decompose on site.
- Large woody debris may be stored at pit sites for later use in restoration projects.
Noxious Weed Control – 3A2
This group of activities is focused on control of weed species and infestation locations identified in this plan document and mapped in HATS. The focus is on species that are legally designated in state and county regulations for required control by all property owners, along with any other identified and agreed upon species/locations that pose a unique threat to the roadside or surrounding environment if not controlled. Work under this group is considered second priority after safety related objectives have been addressed.

In some counties, noxious weed laws may be enforced with fines and/or control work by the counties and billing of property owners – if adequate control is not accomplished. WSDOT communicates annually and throughout the season with each County Noxious Weed Board, to identify and prioritize treatment sites on state highways.

WSDOT employs three distinct strategies in planning and executing noxious weed control efforts. Any and all Class A species that occur on the right of way are treated as **Priority Noxious Weed Control**, and all maintenance actions are planned and tracked as individual, multi-year treatment sites. **General Noxious Weed Control** is planned and executed in one of two ways: 1.) Area-wide patrol and control operations are made in the early summer with a goal of spraying or pulling all visible target species and any notifications from the County weed boards, prior to seed-set, and 2.) Early and late season treatments are planned for a set of prioritized and mapped infestation points where the goal is early detection/rapid response/eradication.

**Priority Noxious Weed Control**
**Work Operations:** 1616, 1618, 1641, 1699
**HATS Point Feature-based Forms:** Priority Infestation
**HATS Map Layer:** Feature points – Roadside Features/Noxious Weed Control Priority
These operations are directed at locations where Class A noxious weed species are present on the right of way and state law requires complete eradication. Site specific integrated treatment plans are developed for each identified location/species, and all control activities are recorded as point feature data in HATS. Ongoing operations will combine field monitoring and a mixture of seasonally timed treatment methods over a series of years. Sites must also be monitored for 3 to 5 years after control, to check for grow back.

**Species and Locations**
- No Class A species are known to existing in SW Area 2 at this time.

**Locations of Planned Treatments**
- If infestations are discovered, they will be recorded as features in HATS layer – **Noxious Weed Control Priority** for species location and distribution.

**General Noxious Weed Control**
**Work Operations:** 1616, 1618, 1699, 1641
**HATS Form:** Noxious Weed Control General – Noxious Weed Control-Spray, Noxious Weed Control-Mechanical, Noxious Weed Control-Manual, and Noxious Weed Control-Biological
**HATS Map Layer:** Reference points – Roadside Features/Noxious Weed Control General (Under Development)
These operations are timed and carried out throughout the season to prevent the spread of designated noxious weed species, and to reduce or eliminate populations wherever possible. Integrated treatments as described in the table below, are planned to address infestations through 1.) seasonally timed treatments of identified priority sites, or 2.) during late spring/early summer section patrols to treat all visible target weed species. Successful plans are consistently implemented over a series of years and annually adjusted as necessary based on field observations. Care is taken in all cases to avoid damage to surrounding desirable/native vegetation.
Target Species on WSDOT Right of Way in Southwest Region Area 2

<table>
<thead>
<tr>
<th>Common Name/Botanic Name</th>
<th>Treatment Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiny geranium/Geranium shinetarium</td>
<td>Target sites mapped and treated in the spring and fall, and incidental to seasonal weed patrols</td>
</tr>
<tr>
<td>Knotweed sp./Polygonum sp.</td>
<td>Target sites mapped and treated after flower stage in late summer</td>
</tr>
<tr>
<td>Ragwort tansy/Senecio jacobaea</td>
<td>Occurs sporadically throughout the area. All visible plants are sprayed in the spring prior to bud/seed set, any remaining plants visible in flower are hand pulled with seed heads removed, bagged, and disposed of</td>
</tr>
<tr>
<td>Knapweed sp./centauria sp.</td>
<td>Control where visible in conjunction with summer seasonal patrols</td>
</tr>
<tr>
<td>Scotch broom/Cytisus scoparius</td>
<td>Control required east of Packwood on US12 where all visible plants are treated annually with herbicide in the early summer. Cowlitz All other areas, controlled only in small isolated patches or incidental to seasonal weed patrols.</td>
</tr>
<tr>
<td>Dalmation toadflax/Linaria dalmatica</td>
<td>Target sites mapped and treated in early spring, sites are monitored and retreated in the fall if there is any grow back.</td>
</tr>
<tr>
<td>Rush skeletonweed/Chondrilla juncea</td>
<td>Target sites mapped and treated in early spring, additional treatments are made to any remaining plants visible when summer season weed patrols are conducted.</td>
</tr>
<tr>
<td>Hawkweed sp./Hieracium sp.</td>
<td>Control where visible in conjunction with seasonal patrols</td>
</tr>
<tr>
<td>Common fennel/Foeniculum vulgare</td>
<td>Target sites mapped and treated in early spring</td>
</tr>
<tr>
<td>Poison hemlock/Conium maculatum</td>
<td>Target sites mapped and treated in early spring</td>
</tr>
<tr>
<td>Butterfly bush/Buddleia davidii</td>
<td>Control where visible in conjunction with seasonal patrols</td>
</tr>
</tbody>
</table>

Planned Treatments
- Approximately 75 acres of herbicide application and/or manual controls with applied throughout the area.
- Planned treatment areas and species as described in the table above are identified in collaboration with the Lewis County Noxious Weed Board and mapped in the HATS map layer – Noxious Weed Control General.
- Area IVM technicians will verify and edit weed location and planned treatment data in HATS as treatments are carried out through the season.

Treatment Methods and Timing
- As described in the table above.
- Herbicide mixes used for summer weed patrol treatments:
  - Capstone @ 128 ozl/acre
  - SylTac @ 8 ozl/acre
- Herbicide mixes used in early spring for treating identified priority locations and species described above:
  - Perspective @ 2.5 ozl/acre
  - SylTac @ 8 ozl/acre
- Herbicide mixes used in late summer/fall for treating identified priority locations and species described above:
  - Capstone @ 128 ozl/acre
  - SylTac @ 8 ozl/acre
Nuisance Vegetation Control – 3A3

Nuisance vegetation control takes place only in a select set of carefully prioritized locations throughout the area. These locations are delineated on maps in HATS as polygon outlines in Zone 3. Locations are prioritized to take place where there is heightened local interest in the visual appearance and condition of the roadside vegetation. Typical locations include: wider areas along limited access freeways in urban and suburban areas, freeway interchanges for local urban centers, environmentally sensitive areas, and areas where neighbors are willing to partner with WSDOT on management efforts. Because nuisance weed control activities are not related to safety or legal requirements, and are primarily undertaken to improve the visual appearance of the roadside, they are considered the last priority vegetation management needs.

For all areas designated to receive Nuisance Vegetation Control, multi-year treatment plans have been developed. The actions contained in these plans will be executed and tracked in relation to specific Zone 3 polygons for Nuisance Vegetation Control Zone 3, referenced on HATS maps and described below.

Nuisance Vegetation Control
Work Operations: 1611, 1612, 1641, 1699
HATS Feature-based Forms: Herbicide Application, Manual/Mechanical, Biological, and Seed/Fertilize/Mulch
HATS Map Layer: Feature polygons – Roadside Features/Nuisance Vegetation Control Zone 3

Maintenance activities in each identified location are planned and tracked as multi-year treatment strategies utilizing monitoring and the most effective combination of control methods – with a goal of establishing desirable vegetation that requires only minimal maintenance. Undesirable species are identified and specifically targeted while care is be taken to avoid damage to surrounding desirable/native vegetation. In some cases, soil enhancements may be used as well as seeding or planting of beneficial competition species. Successful plans are consistently implemented over a series of years and annually adjusted as necessary based on field observations.

Total Units of Planned Treatment
- Approximately 25 acres will be treated with herbicides for nuisance weed control.
- No mowing for nuisance vegetation will be done in this maintenance area during the 2017 season.

Locations of Planned Treatments
- Managed areas will be mapped during the 2017 season in the HATS layer – Nuisance Vegetation Management.

Treatment Methods and Timing
- All managed areas will be spot sprayed to control all undesirable vegetation with the following herbicides:
  - Capstone @ 128 ozl/acre
  - Syltac @ 8 ozl/acre