Olympic Region, Area 4

Integrated Roadside Vegetation Management Plan

2022

Washington State Department of Transportation
Maintenance Operations Division

Introduction

The Washington State Department of Transportation's (WSDOT) Olympic Region Area 4 manages vegetation within approximately 250 miles of state highway corridor in Grays Harbor, southwest Jefferson, and western edges 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 metropolitan areas and the Washington Coast. Other corridors include 85 miles of US 101, State Routes 105, 107, 108, 109, and 115. 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, employee 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.

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 refining the most efficient maintenance procedures and establishing naturally self-sustaining roadside vegetation. 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 required highway maintenance activities.

This plan serves as the guidance document for vegetation maintenance in Olympic Region Area 4 for the 2022 growing season. It identifies priority locations and prescribes treatments for accomplishing safety and 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 minimize roadside maintenance requirements wherever possible. 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 can be geographically referenced by crews in the field using iPads and the agency's Highway Activity Tracking System (HATS). Accomplishments and results are also tracked geographically through this system, providing site specific reference of historic actions and results. This development in WSDOT maintenance management will greatly improve the agency's success in properly executing planned actions, monitoring and documenting results of treatments, and in measuring cost and results over time.

WSDOT welcomes input from local public and private entities on its weed control and vegetation management activities. Wherever appropriate the agency is looking for opportunities to plan, cooperate, and partner with others in managing the roadside. Please direct any questions, comments or suggestions to the Olympic Region Area 4 Superintendent – Brent Schiller, Assistant Superintendent Cliff Whitehill, or the State's Roadside Asset Manager – Ray Willard.

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Olympic Region, Area 4 Map
Figure 1

This is an outline of the overall approach and geographic distribution of roadside vegetation management requirements throughout the maintenance area in 2022. 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**. **Safety Rest Area** Landscape Maintenance and **Stormwater** Facilities vegetation maintenance activities are also covered. 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.

Safety First

Safety of our employees, the traveling public, and the environment are WSDOT's highest priorities and key to our success. Pre-Activity Safety Plans (PSAP) are developed for all activities and crews review, discuss, and sign these plans at tailgate meetings, prior to each day's work. When applying herbicides, our licensed pesticide applicators read the entire label before using products and use the products strictly in accordance with label precautionary statements and directions. WSDOT has implemented additional agency specific environmental restrictions on some products, to minimize any risk to aquatic or terrestrial ecosystems. Applicators wear protective equipment applicable to the products being used and discuss any potential environmental and/or human health risks as part of the daily PASP meeting. Technicians inspect their calibrated equipment daily to ensure it is in proper working order. Herbicides are stored in locked facilities and kept in an organized condition.

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: Pesticide Application
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 is preserving of 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 **200 acres** of herbicide treatment to road shoulders throughout the area.

Locations of Planned Treatments

- Planned treatment sites are mapped in HATS layer – **Spray Zone 1 Reference**
- All established gravel shoulders throughout the area will be treated annually with herbicides, except in the locations listed below.
- Locations where grasses are established to the edge of pavement and no residual herbicide treatments will be applied:
    - Hoquiam Watershed US 101 / MP 94.4 - 100.32 (guardrail only w/ aquatics, rails need to be cleaned out first)
    - Select areas within the Olympic National Forest on US 101 between MP 118 - 130.8
    - Private property no spray agreements - All routes

- Inside City Limits except limited access areas
- Locations where aquatically approved mixture of herbicides will be used to treat all shoulder include:
  - US 101 crossing Quinault tribal lands
  - SR109 MP32 to MP 40.41
- Steel plow is run periodically on all routes, in areas without guardrail to remove minor amounts of shoulder buildup.
- At intersections with local roads throughout the area, a wider bare gravel area will be established for improved sight distance and traffic safety. Areas where additional bare ground treatment will be applied include:
  - US 12 - Dunlap (24.50), Elma Gate West (30.14), Shelton (32.01)
  - Elma Gate East (34.53), Merry (35.79), Blockhouse (36.35)
  - Elma Gate East (37.44), Forstrom (40.68), Roseburg SW (42.89), Hilt (43.2), Denmark (43.49)
  - US 101 - Lund (74.01), Artic (74.8 / 75)
  - SR 107 - Lempie (1.79), Blue Slough (2.96), Melbourne (5.3 / 5.78), Minkler (6.76)
  - SR 108 - Eich (9.25), Hurley Waldrip (9.7)

Treatment Methods

- Herbicides are applied using a truck mounted power spray system calibrated to deliver a 2 - 4 ft. band of spray mixture on and adjacent to the paved shoulder. The resulting width of treated shoulder is intended to extend just beyond guardrail or guideposts, and may be wider than 4 ft. in areas with steeper shoulder slope.
- All noted locations will be treated in mid to late spring with the following mixture of herbicides and adjuvants in ounces (liquid or dry measure) per acre.

  Blend R6 on the state contract:
  - Roundup Pro Concentrate @ 32 oz/acre
  - Lockdown SC @ 8 oz/acre
  - Milestone @ 7 oz/acre
  - Telar @ 2 oz/acre
  - 16 oz/acre Insist 90

  Aquatic Sensitve Areas

  Blend SA1 on the state contract:
  - Aquatic approved glyphosate @ 48 oz/acre
  - Aquatic approved imazapyr @ 48 oz/acre
  - Aquatic approved surfacant @ 16 oz/acre

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 **130 acres** will be mowed along the pavement edge throughout the area

Locations of Planned Treatments

- Planned routine mowing locations are mapped in HATS layer – **Mowing Zone 2 Reference**

- Areas mowed annually for special purposed include:
    - 2 pass (10' wide) mowing - Olympic National Forest US 101 / MP 118 - 130.8
    - 2 pass (10' wide) mowing - SR 109 MP 16.16 - 20.79 for Fire Over the Water Festival
    - City of Hoquiam mows US 101 / MP 94.4 - 100.32

Treatment Methods

- Side flail mower & sidearm rotary mower
- Hand held gas powered weed trimmers used as needed for spot treatment for improved sight distance and around roadside hardware.

Tree and Brush Control/Zone 2 and 3
Work Operations: 1622, 1625, 1626
HATS Forms: Pesticide Application for spray applications, and three sub-forms under Tree/Brush Control –Trimming Mechanical, Trimming Manual, and Mowing
HATS Map Layer: None

This includes safety and traffic operations related work in Zone 2, such as periodic side-trimming or pruning of brush and trees or tree branches behind guardrail, encroaching on or overhanging traffic operations, and/or impacting sign visibility. Also included is work in Zone 2 and 3 when selectively controlling emergent early succession tree species – to prevent them from growing into mature hazard trees within striking distance of the road.

Total Units of Planned Treatment

- An average of **100 acres** per year are trimmed and/or controlled with mechanical cutting using tractor-mounted cutters
- Up to **15 acres** will be controlled with hand-held cutting tools
- Up to **10 acres** will be treated with herbicides (mostly through cut-stump treatment)

Locations of Planned Treatment

- The area goal for this activity is to treat all corridors on a three to four year rotation to maintain site distance where there is encroach brush or tree branches on all roads. For the coming year the area has identified the following sections as the first rotation for approximately on third of the area's roadsides:
    - SR 8 Median MP 9.7 - 12
    - SR 109 MP 32.2 - 40.5

Treatment Methods

- Trim with side arm mower, mow with Brown Brush Monitor in areas with heavy seedling growth, stump treatments, hand work and selective herbicide applications

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. These activities also include clean up of wind blown limbs and debris if not part of a declared disaster.

Total Units of Planned Treatment

- Between **100 and 200 mature hazard trees** are removed throughout the area in a typical year, including clean up from storm damage

Locations of Planned Treatments

- Annual evaluation and removal of identified hazard trees is a year-round practice throughout the area.

- Through an agreement with the Forest Service, the forested area bordering the highway between US 101 MP 123.54 - 125.54 and 129 - 130.77 is cruised every year for hazard trees. Mutually identified hazard trees are removed.

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 hazard trees identified at any time are removed as soon as possible.
- If trees growing outside WSDOT right of way are hazards, crews work with the neighboring property owner to negotiate removal.
- Cut and drop in place wherever possible
- Stump treat with herbicides to prevent re-growth when needed

Noxious Weed Control – 3A2

This group of activities includes control of non-native invasive weed species as defined by state law and individual county designation. This group of activities is second priority vegetation management work after safety related objectives have been addressed. While all Class A, B, and C noxious weed species as listed in RCW 17.10 are considered potential targets for WSDOT noxious weed control, the agency is currently not funded to achieve 100% control of all noxious weeds. Therefore, the top priorities for weed control are focused on locations and species that are more limited in distribution on the right of way – where there is a chance of successful eradication. To prioritize control of species that are already widespread in the area, WSDOT works with the local county noxious weed boards and coordinators, to annually review and determine which species and locations will be specifically targeted.

To prioritize, plan, and track noxious weed control, WSDOT maps and monitors weed infestations in three categories: **Priority**, **Planned Treatment**, and **General Reference**. **Priority** locations are where Class A noxious weed species exist on the right of way, and complete eradication is required by state law. **Planned Treatment** sites are locations where there are new, and/or limited distribution infestations of Class B and C noxious weed exist, and eradication is possible. **General Reference** sites are recorded for reference only to document the presence of noxious weed species which are more commonly occurring in the local area.

Noxious Weed Control
Work Operations: 1616, 1618, 1641, 1699
HATS Forms: Pesticide Application (for spray applications,) and three sub-forms under Noxious Weed Control General– Manual/Mechanical, Seed/Fertilize/Mulch, and Biological
HATS Map Layer: Reference Points – Roadside Features/Noxious Weed Control Priority, Noxious Weed Control Planned Treatment, and Noxious Weed Control General Reference

Operations are prescribed throughout the season to prevent the spread of any legally designated noxious weed species, and to reduce or eliminate populations wherever possible. Integrated treatment plans combine field monitoring and an integral mixture of seasonally timed control methods with proven effectiveness on designated species. Successful plans are consistently implemented over a series of years and annually adjusted as necessary based on field observations. Care must be taken in all cases to avoid damage to surrounding desirable/native vegetation.

Target Species Known to Exist on WSDOT Right of Way in Olympic Region Area 4

Common Name/Botanical Name	***Treatment Notes***
Butterfly bush/Buddleja davidii	Control where visible in conjunction with seasonal patrols
Gorse/Ulex europaeus	Target sites mapped and treated in spring prior to bloom
Hawkweed species/Hieracium sp.	Control where visible in conjunction with seasonal patrols

Himalayan knotweed/Polyginum polystachyum	Target sites have been mapped and controlled in previous seasons. Monitor for any regrowth for five years.
Japanese knotweed/Polyginum cuspidatum	Target sites mapped, and treated in late summer/fall
Knapweed sp./Centaurea sp.	Target sites mapped Control where visible in conjunction with summer seasonal patrols
Orange hawkweed/Hieracium aurantiacum	Target sites mapped and treated in early spring, additional treatments conducted if necessary in conjunction with seasonal patrols
Poison hemlock/Conium aculatum	Target sites mapped and treated in spring prior to bolt
Purple loosestrife/Lythrum salicaria	Target sites mapped and treated at early flower stage in summer
Ragwort tansy/Senecio jacobaea	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
Reed canary grass/Phalaris arundinacea	Only targeted in mapped locations agreed upon with county noxious weed control
Rush skeletonweed/Chondrilla juncea	Target sites mapped and treated in spring prior to bolt
Shiny geranium/Geranium lucidum	Target sites mapped and treated several times throughout the growing season as needed
Teasel/Dipsacus fullonum	Target pioneer infestations are mapped and treated in spring
Wild chervil/Anthriscus sylvestris	Target sites mapped and treated in early spring
Yellow flag iris/Iris pseudacorus	Target sites have been mapped and controlled in previous seasons. Monitor for regrowth.

Total Units of Planned Treatment

- Approximately **75 acres** will be treated with herbicides
- Less than **5 acres** will be cut mechanically, or pulled by hand.

Locations of Priority Treatments

- Technichians will develop location maps for species below and described in the table above, for future reference of priority treatments in early spring and late summer during the 2022 growing season.
- Priority treatment sites for the 2022 season include:
    - Tansy ragwort - SR 8 & US 12 in Thurston County
    - Gorse - SR 109 MP 24.5, and 25.7 - 29
    - Spotted knapweed - SR 101 MP 114.1-114.2
    - Spotted knapweed - SR 105 MP 45.90
    - Yellow hawkweed - SR 109 MP 12-12.2
    - Mouse ear hawkweed - SR 109 MP 29.8 - 30.1
    - Poison hemlock – US 12 MP 39.5
    - Shiny geranium – US 12 MP 40 (Elma Rest Area)
    - Teasel – US 12 MP 39.6 (near county line)
    - Yellow Flag iris - US 12 MP 20.35
    - Rush skeltonweed - US 12 MP 42.6- 42.9
    - Knotweed - various locations throughout the area

Treatment Methods and Timing

- A broad spectrum mixture of herbicides will be utilized in the late-spring/early-summer treatment window:
    - Element 3A @ 48 ozl/acre
    - Milestone @ 7 ozl/acre
    - Escort @ 2 ozd/acre

    - Insist 90 @ 16 ozl/acre
- Hand pulling will be utilized for some species control where necessary

Nuisance Vegetation Control – 3A3

Nuisance vegetation control takes place only in a select set of carefully prioritized locations along the wider areas of right of way throughout the state. These locations are delineated on maps in HATS as polygon outlines where right of way is wide enough for Zone 3 to exist. Locations are prioritized to receive treatments where there is heightened local interest in a more controlled visual appearance and highly maintained condition. 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 lowest 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 Zone 3
Work Operations: 1611, 1612, 1641, 1699
HATS Forms: Pesticide Application (for all spray applications), and 3 sub-forms under Nuisance Veg. Control General – Manual/Mechanical, Biological, and Seed/Fertilize/Mulch
HATS Map Layer: Reference polygons – Zone 3 Nuisance Reference

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 **30 acres** of nuisance weed control will be conducted with a combination of spraying and mowing in designated priority locations

Locations of Priority Treatments

- Polygons have been drawn to show treatment sq. feet/acres in the following areas:
    - US 12 Devonshire Interchange
    - US 12/SR 8 Interchange
    - Select locations along US12/SR8
    - Elma Interchange

Treatment Methods and Timing

- Mow scotch broom and blackberries with Brown Brush Monitor on a two to three year cycle depending on rate of regrowth. Once infestations have been minimized areas will be spot treated as needed annually to prevent weed seed production.
- Steep areas will be mowed with arm mounted mowing heads and/or hand tools If not stump treated, regrowth will be treated with foliar herbicides in the fall or in the following spring.

Safety Rest Operations – 7B1

All safety rest areas have planted areas and vegetation maintenance requirements throughout the facility. These are some of WSDOT's most heavily accessed facilities and often one the first impressions of Washington State for the visiting public. The goal in maintenance of rest area landscape plantings is to present a well-kept appearance and plantings are intended to be maintained in a set condition throughout the year. For landscape treatments in these facilities the goal is to maintain healthy plantings in all three zones and to control all weeds. Planted vegetation is intended to be preserved and enhanced over time through pruning, hedging, trimming, and including irrigation and fertilization where necessary.

Safety Rest Area Landscape Maintenance

Work Operations: 1711, 1752, 1789, 1799

HATS Forms: Pesticide Application (for all spray applications)

HATS Map Layers: Formal Landscape and Natural Landscape polygons

Rest area landscape maintenance operations may be conducted by rest area attendants and/or maintenance area IVM specialists. Planting areas at all rest area sites are mapped as two sets of reference polygons in HATS showing areas with formal landscape plantings and those with naturalized plantings. Treatment plans are based on monitoring and evaluation of previous years' actions and results. Annually adaptive plans are based on the proven most effective combination of maintenance actions to keep plantings (and lawns if present) looking healthy and trimmed throughout the year.

Locations of Safety Rest Areas in Northwest Region Area 3

- Elma Safety Rest Area – US 12, MP 1.7 to 2.0

Treatment Methods and Timing

- Vegetation management activities within Safety Rest Areas is conducted by the Area 3 crew with some assistance from the Rest Area Attendants.
- Routine landscape related work requirements include:
    - Annual startup and winterization of irrigation.
    - Weekly mowing and routine edging of lawn areas
    - Weed control in lawns and in planting beds around pedestrian areas
    - Noxious weed control for Shiny geranium

Drainage and Stormwater Facilities Maintenance – 2A4

Highway drainage features which require vegetation management include ditches and culvert ends. Stormwater facilities maintenance operations that include vegetation management considerations are discussed in this section of the plan. This work is regulated by the agreement WSDOT has established under the statewide National Pollution Discharge Elimination System (NPDES) permit granted to the agency by the USEPA.

Drainage System and NPDES Maintenance

Work Operations: 1331, 1368, 1399

HATS Forms: Pesticide Application (for all spray applications), other forms are in Stormwater Feature Layer

HATS Map Layer: All feature types listed under Stormwater Features Layer

Periodic removal of vegetative growth is necessary in ditches and around culvert ends to allow access for routine inspection and repair. There are several vegetation management activities necessary to maintain function and operation of certain constructed stormwater management facilities such as vegetated filter strips and swales along the edge of pavement and throughout the roadside, and stormwater retention/detention ponds in the more urbanized areas. Each of these design features should include a manual which details the requirements in relation to control of vegetation and sediment buildup over time.

Locations of Planned Treatments

- All stormwater management facilities are mapped within the Stormwater Features Layer in HATS.
- All culverts are mapped in HATS, vegetation around culvert ends is maintained to be low growing and free of trees and brush.
- Vegetation management activities in stormwater management features are specified in the Highway Runoff Manual, Chapter 5, and Owner's Manual for each constructed feature (if it exists). If no Owner's Manual questions should be directed to Region Hydraulics and Landscape Architecture.
- Required work in stormwater features within the area for 2022 include:
    - None required

Treatment Methods and Timing

- Weed control within stormwater management features is carried out in concert with other weed control activities throughout the area, as described in the plan section Noxious Weed Control – 3A2 above.
- Removal of trees and brush in ditches and around culvert ends may be conducted in conjunction with other chemical and mechanical tree and brush control operations.