Benton County

ROADS, FACILITIES, PARKS & NATURAL AREAS

STANDARD OPERATING PROCEDURES & BEST MANAGEMENT PRACTICES

2022

CONTENTS

INTRODUCTION

Best Management Practices (BMPs) are intended to guide Benton County in minimizing impacts to environmental and cultural resources while maintaining infrastructure.
These BMPs are largely based on the Oregon Department of Transportation (ODOT) Routine Road Maintenance Water Quality and Habitat Guide Best Management Practices (Figure 1).

The activities detailed in this document are subject to Benton County's DSL/USACE joint permit and/or Oregon Department of Environmental Quality (OR DEQ) 1200-CA permits. The County's 1200-CA permit requires compliance with the MS4 Program while conducting construction and maintenance activities in the County Right-of-Ways.

Benton County's BMPs reference the Endangered Species Act (ESA) and incorporate guidance from the:

- ✓ **National Marine Fisheries Service (NMFS),**
- ✓ **Oregon Department of Fish and Wildlife (ODFW),**
- ✓ **Oregon Department of Environmental Quality (OR DEQ),**
- ✓ **US Fish and Wildlife Service (USFWS),**
- ✓ **Oregon Department of Agriculture (ODA),**
- ✓ **US Department of Agriculture and Plant Health Inspection Service (APHIS),**
- ✓ **Wildlife Service (WS), US Forest Service (USFS), and the**
- ✓ **State Historic Preservation Office (SHPO)**

Benton County BMPs should serve to protect and conserve salmonid and steelhead that are listed as threatened, as well as wetlands, cultural and other protected resources. They also provide the county with direction on how to minimize regulatory compliance risk.

The BMPs throughout this document directly address many of Benton County's Focus Areas and Vision, including: Community Safety; Outdoor Recreation; a Prosperous Economy; Environment and Natural Resources; Mobility and Transportation; Arts, Entertainment, Culture and History; and Food and Agriculture. They also address Core Values of Benton County's 2040 Thriving Communities Initiative: County Demographics; Vibrant, Livable Communities; Supportive People & Resources; High Quality Environment and Access; Diverse Economy that Fits; and Community Resilience.

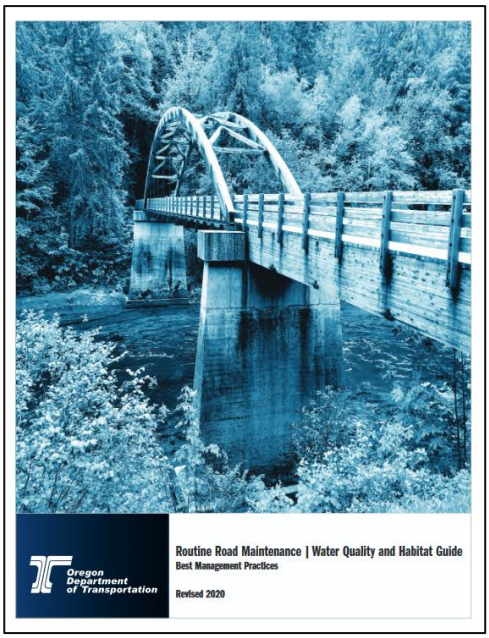

Figure 1 ODOT Water Quality and Habitat Guide BMPs

CULTURAL AND NATURAL RESOURCES

The phrases 'to the maximum extent practicable/as possible' are used throughout this guidebook. This guidance refers to situations where distinct requirements may not exist. Staff are encouraged to use their best judgement to mitigate environmental impacts as best as possible.

Some activities, like spraying within Special Management Areas or disrupting fish passage, have permit-related requirements that require designated permission from collaborating agencies such as ODOT, USFWS, NMFS or others. If procedures for regulated activities are unclear, please contact your Crew Lead or Department Head for direction. **Crew leads or supervisors should be aware of permit requirements while work is being planned and before it takes place.**

The lowest impact work options should be used in consideration of Benton County's missions of sustainability and environmental stewardship. The appendices at the end of this guide, as well as the **ODOT Water Quality and Habitat Guide Best Management Practices (Blue Book)** provide further details on certain maintenance, construction, or cleaning activities.

Throughout this book, **a water drop icon ( ) accompanies activities that have direct implications for water quality and erosion and sediment control** which are further regulated by Benton County's DEQ National Pollution and Discharge Elimination System (NPDES) permit.

Archaeological Resources

- **If archaeological material is identified during any work activity, STOP WORK immediately**.
- Contact the project manager or the Department Head who will then coordinate with the appropriate government agency and/or tribe in order to continue work after required assessment and preservation measures.

Nesting Birds and Bat Colonies

- If work activities **will directly impact active nesting migratory birds or bat colonies, STOP WORK immediately** and notify the Project Manager or Department Director as these species are protected.

Water Quality

	Denotes **water quality**, erosion and sediment control-related activities
	Denotes activities impacting fish passage and **protected fish species**

GENERAL GOOD HOUSEKEEPING

Mitigation and avoidance are key to Best Management Practices. BMPs in this section apply at all times.

Safety

Implementing BMPs should never take precedence over ensuring employee safety.

BMPs seek to minimize the environmental and cultural impacts of Benton County's activities. However, managers may need to exercise flexibility where possible in implementing BMP measures, particularly in consideration of employee safety.

Streams and Waterways – Best Management Practices

- **Keep debris, road materials, and chemicals out of streams**. OR DEQ prohibits introduction of any chemicals, runoff, or sediment into State waters.
- Prioritize the use of environmentally friendly products whenever possible.
- Use non-toxic structural repair materials for in-water features.
- Dampen mechanical sounds in fish-bearing streams if required by permit.
- **Use erosion and sediment measures when vegetation or ground is disturbed**. [1] Examples include straw, mulch, geotextile fabrics, plastic sheeting, matting, sediment fence or wattles.
- Work in and around wetlands requires extreme care and DEQ, DSL, ODFW, USACE, or USFWS permits may apply.

Vegetation – Best Management Practices

- Protect existing vegetation at all times, including implementing low-impact development practices.
- Use environmentally friendly (e.g. DEQ-approved) herbicide/insecticide products and application methods.
- Perform work in a manner that minimalizes any impact to water quality or vegetation.
- Be aware of regulations and approved protocols while working within Special Management Areas (SMAs). Consult the Special Management Areas section of this document and Benton County's Prairie Species Habitat Conservation Plan (HCP) for guidance.

📖 [1] Appendix F: In Water Work Period & ODOT Erosion Control Manual References and Appendix G: ODOT Erosion Control Manual

BEST MANAGEMENT PRACTICES

1 ATTENUATOR MAINTENANCE [2]

1.1.1 Description

Impact attenuators are physical systems placed along exit ramps, bridge abutments, etc. to reduce damages to infrastructure, vehicles and motorists resulting from a crash. Attenuators compact upon impact, sometimes releasing fluid that may flow into drainage systems or waterways. Attenuator maintenance includes repair, replacement, and restoration of these systems for the safety of the traveling public.

1.1.2 Mitigation, Avoidance and BMPs:

- Use non-chemical systems when installing new attenuators.
- Install and use the most environmentally sound devices.
- Use absorbent materials (dams, diapers, etc.) around attenuators during repair or maintenance.
- Identify and close inlets during attenuator maintenance if this can be done safely.

2 BRIDGE CLEANING AND MAINTENANCE

2.1.1 Description

This activity includes maintaining bridges and culverts in a way that minimizes impacts to natural and cultural resources. Work may include: jet rodding of drain holes; weeps and scuppers; drift removal; maintenance of bridges and large culverts (greater than 3ft diameter); sweeping/shoveling debris off bridge decks; pressure washing deck, rails and under supports while capturing runoff and sediment or discharge; and painting, scraping or patching curbs, rails, deck joints, or concrete and steel bridge components.

ODFW and NMFS fish passage requirements must be adhered to when performing many of these activities. Some activities that impact fish-bearing water bodies may require additional permits.

2.2 Drift Removal

- Remove drift during the in-water work window (*see Appendix F*).
- Turn, or cut and turn, and allow drift to float.
- Use environmentally-friendly bar oil when cutting over water.
- Remove drift when necessary; place above the Ordinary High Water Line (OHWL) or further downstream to float.

[2] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 17

- Materials should be cleaned up at the source and handled/disposed of using erosion and sediment control protocols. [3]
- Materials **should not** be allowed to enter the water.
- Stabilize material in a timely manner, including: [3]
    - Spreading and top seeding;
    - Covering with matting or straw;
    - Hauling away and managing any material that cannot be stabilized above the OHWL.
- **Repair and restore riparian areas impacted by machinery. [3]**

2.3 Bridge Cleaning

2.3.1 *Pressure Washing*

- Temporarily block deck drains and scuppers when pressure washing, sandblasting, or scraping to route water off deck and into vegetated areas. [4]
- Remove debris in a way that prevents material from entering waterbodies, including removing large debris with a sweeper or a shovel.
- Other material may be scraped by hand and collected before pressure washing.
- Prevent paint overspray with a shield.
- Pressure wash only at times of high water using low volume, high pressure water.

2.3.2 *Sweeping*

- When sweeping, collect material and dispose of away from the bridge/water.
- Stop pressure washing if paint chips have the potential to enter the stream. Set-up containment to collect paint chips.
- Position broom so that material is swept towards the end of the bridge deck onto the vegetated shoulder.

2.3.3 *Bird Nests*

- Inactive bird nests (empty nests that do NOT have eggs or chicks) may be cleaned off at any time.
- If bridge washing activities **will directly impact active bird nests or bat colonies, ⬢ STOP WORK immediately** and notify the Project Manager or Department Head.

2.3.4 *Fish*

- Mimic natural stream channel conditions.

📖 [3] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET6100, DET6101, DET6102, DET6103)

📖 [4] Appendix A: Erosion and Sediment Control Details (RD1010, RD1015)

- Minimize or eliminate jumps created during cleaning. Adhere to ODFW fish passage guidelines and permits.
- Repair damage to existing fish passage modifications.
- Repair damage to the bridge that may have occurred during cleaning.

3 BRIDGE REPAIR [5]

3.1.1 Description

Repair bridges and large culverts (greater than 3ft diameter) while minimizing impacts to natural and cultural resources. Includes repair or replacement of riprap, bridge drainage features, and catch basins and replacement of structural components.

3.1.2 Mitigation, Avoidance and BMPs

- **Coordinate bridge repairs with the in-water work window if access within the channel is required. Permits may be required – check with Benton County Engineering.** [6]
- **Concrete spilled into a waterway is virtually impossible to clean up and toxic for fish and wildlife.** Ensure that concrete does not come into contact with water bodies - follow BMPs.[7]
- **Historic review and approval is <u>not</u> required for the following activities on historical bridges:**
  - Deck surface work (e.g. striping, paving, joints, epoxy overlay, patching, and deck seals);
  - Replacement of moveable bridge controls and related traffic safety systems;
  - Scour repair.

3.2 In-Water Work [8]

- Mimic natural stream channel conditions upstream and downstream of bridge.
- Consider bio-engineering solutions for bridge repair work that requires installation of riprap.

3.3 Wildlife

- Adhere to ODFW Fish Passage permits and guidelines on fish passage solutions.
- Repair existing fish passage modifications like weirs or baffles if damage occurs during repair.
- Remove and dispose of repair material using proper environmental protocols; do not allow to enter water.

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[5] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 19

[6] Appendix F: In Water Work Period & ODOT Erosion Control Manual References and Appendix G: ODOT Erosion Control Manual

[7] Managing Concrete; Concrete Washout; Managing Concrete and Mortar; Slurry and Concrete Management

[8] Appendix H: Temporary Water Management

3.4 Water Quality

- Use a designated concrete truck chute clean-out area to prevent material from being deposited in riparian corridors, wetlands, or washing into a stream or wetland. [9]
- Use cofferdams for structural repairs as appropriate. [10]
- When cutting treated wood, contain chips and do not allow to enter the environment.

3.5 Piling

- Piling work must include erosion and sediment control BMP's and spill containment.
  G:\avery\Public Works\Safety\Spill Plan
- Install floating absorbent boom when treated pile is cut for repair.
- Apply noise mitigation if required by permit.
- Use foam or other quickset material designed for in-water use to plug the void prior to using concrete, if the void is connected to a waterbody.
- Screen any intake pump per NMFS screen criteria during operation (Appendix D of this document).

4 STREAM CHANNEL MAINTENANCE [11]

4.1.1 Description

Stream channel maintenance includes cleaning and repair of existing channels to facilitate culvert flow, maintain the integrity of the channel structure, ensure fish passage, and minimize impacts to water quality and habitat. This activity also includes replacing riprap to restore line and grade of the channel. Vegetation may be removed during this activity.

4.1.2 Mitigation, Avoidance and BMPs

- **This activity may require a USACE and/or a DSL permit if fish are present.**
- Coordinate in-water work with NMFS or ODFW to aid fish passage, minimize sediment, and clarify in-water work windows for transitional stream reaches.
- Work in dry conditions when possible and work below OHWL only during the in-water work window.
- Communicate schedule, methods, and repairs to ODFW at **least two weeks prior** to working in ODFW/DSL sensitive areas (e.g. spawning grounds or essential salmonid habitat).
- Evaluate potential for bioengineering solutions before replacing large sections of riprap. [12]
- Use rock types that maximize habitat function.
- Remove excess material and place above the OHWL or at approved/permitted dump sites.

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[9] Appendix A: Erosion and Sediment Control Details (RD1070), Stormwater Construction Erosion and Sediment Control Elements

[10] Appendix H: Temporary Water Management

[11] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 10

[12] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET5102, RD1055, DET6017, DET6100, DET6101, DET6102, DET6103), Appendix F: In Water Work Period & ODOT Erosion Control Manual References, and Appendix G: ODOT Erosion Control Manual

- Manage drift using the following priorities:
    1. Turning and allow drift to float;
    2. Remove drift to riparian area outside of the channel;
    3. Remove drift and place downstream;
    4. Cut and turn drift to float;
- Handle excess material in a way that minimizes impact to protected resources.
- Stabilize material in a timely manner, including spreading and top seeding, covering with matting or straw, or other appropriate erosion or stabilization control measures. [13]
- Haul away material that cannot be stabilized above the OWHL.

5 CULVERT AND INLET CLEANING AND REPAIR [14]

5.1.1 Description

This section addresses activities done to restore function and to repair damaged water conveyances of ALL types, including box concrete, metal and wood culverts, siphons, catch basins and drop inlets.

Activities may also include clearing debris from culvert inlet/outlets, pump stations, and wash rack sumps, cleaning diversions, trash racks and stand pipes as well as fish passage retrofits and slip linings.

Various equipment may be used including backhoes, spider hoes, vactor or jet rodders, slip chute mechanism, draglines, conveyer belts, bobcats, suction devices (dredges), clam buckets, and shovels. Vegetation may be removed during cleaning. These activities are performed year-round in all weather.

These activities must provide for adequate hydraulic flow and to aid in fish passage while protecting against sedimentation.

Caution should be taken to reduce impacts to protected fish and their habitat. Fish passage and associated ODFW statutes (ORS 509.585-509.610) must be complied with while performing these activities. NMFS Fish Passage design criteria may also be required. Additional information is available on ODFW's Fish Passage Website.

Removal of beaver dams (and other debris dams) that occurs within 20 feet upstream or downstream of the culvert to restore flow, prevent flooding, and allow for fish passage is considered culvert cleaning.

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[13] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET5102, RD1055, DET6017, DET6100, DET6101, DET6102, DET6103), Appendix F: In Water Work Period & ODOT Erosion Control Manual References, and Appendix G: ODOT Erosion Control Manual

[14] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Sections 8 & 9

Before removing beaver dams, consult the Beaver Dam Removal subsection (next page). If work is greater than 20 feet from the end of the barrel, use the practices identified in Section 4: Stream Channel Maintenance.

This activity may require a USACE permit, a DSL permit, temporary water management, fish salvage, or the need to provide fish passage. **If a permit is required, plan in advance to allow time to get permits. Acquiring the permits and scheduling fish salvage can require 75+ business days. Consult with Benton County Engineering.**

5.2 Culvert Cleaning and Debris Dam Removal

- Perform culvert cleaning during lowest stream flow possible (optimally dry) and only during the in-water work window.
- Manage streamflow to minimize turbidity.
- Install erosion control devices prior to work when flowing or stagnant water is present. [15]
- **Minimize or eliminate jumps created that may impact fish passage.** Repair damage or modifications to the culvert (bent ends, disconnected joints, etc.) and fish passage modifications (weirs or baffles) that may have occurred during cleaning.
- Mimic natural stream conditions inside and outside of the culvert.
- Manage removed drift using the following priorities:
    1. Turning and allow drift to float;
    2. Remove drift to riparian area outside of the channel;
    3. Remove drift and place downstream;
    4. Cut and turn drift to float.
- Place excess material above the OHWL where there is no opportunity for material to reach the waterbody; haul away material which cannot be stabilized above OHWL.
- Stabilize material in a timely manner.

5.2.1 Trash Rack Maintenance/Cleaning

- Visually inspect trash rack for debris buildup.
- Ensure that the elevation of the stream on either side of the trash rack mimics natural stream slope to reduce impacts to fish passage. [21]
- Minimize or eliminate jumps that could effect fish passage; follow fish passage permitting requirements set forth by ODFW.
- Ensure that design standards for trash racks are followed on fish-bearing streams**.** [21]

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[15] Appendix A: Erosion and Sediment Control Details (DET5103, DET6012, DET6017, RD1030, RD1031, RD1032, RD1033, RD1040)

5.2.2 *Beaver Dams* [16]

Beaver dams can cause flooding on county roads and damage to other infrastructure including private property (***See next page: Beaver dam sites in Benton County***). Removal of beaver dams may not always be the best long-term solution. Coordinating with conservation partners (see 'Beaver Dam Modification Flowchart') may yield options that will better control beaver activity over the long term. **When possible, mitigation should be used to allow beavers to remain onsite.**

Contact the Environmental Project Coordinator (Public Works) before taking action. The Coordinator will work with NMFS, ODFW and local watershed councils to achieve solutions and determine if a biologist needs to be present to address potential fish stranding. The Environmental Project Coordinator will coordinate installation of deterrents, dam analogs and pond levelers with ODFW if needed.

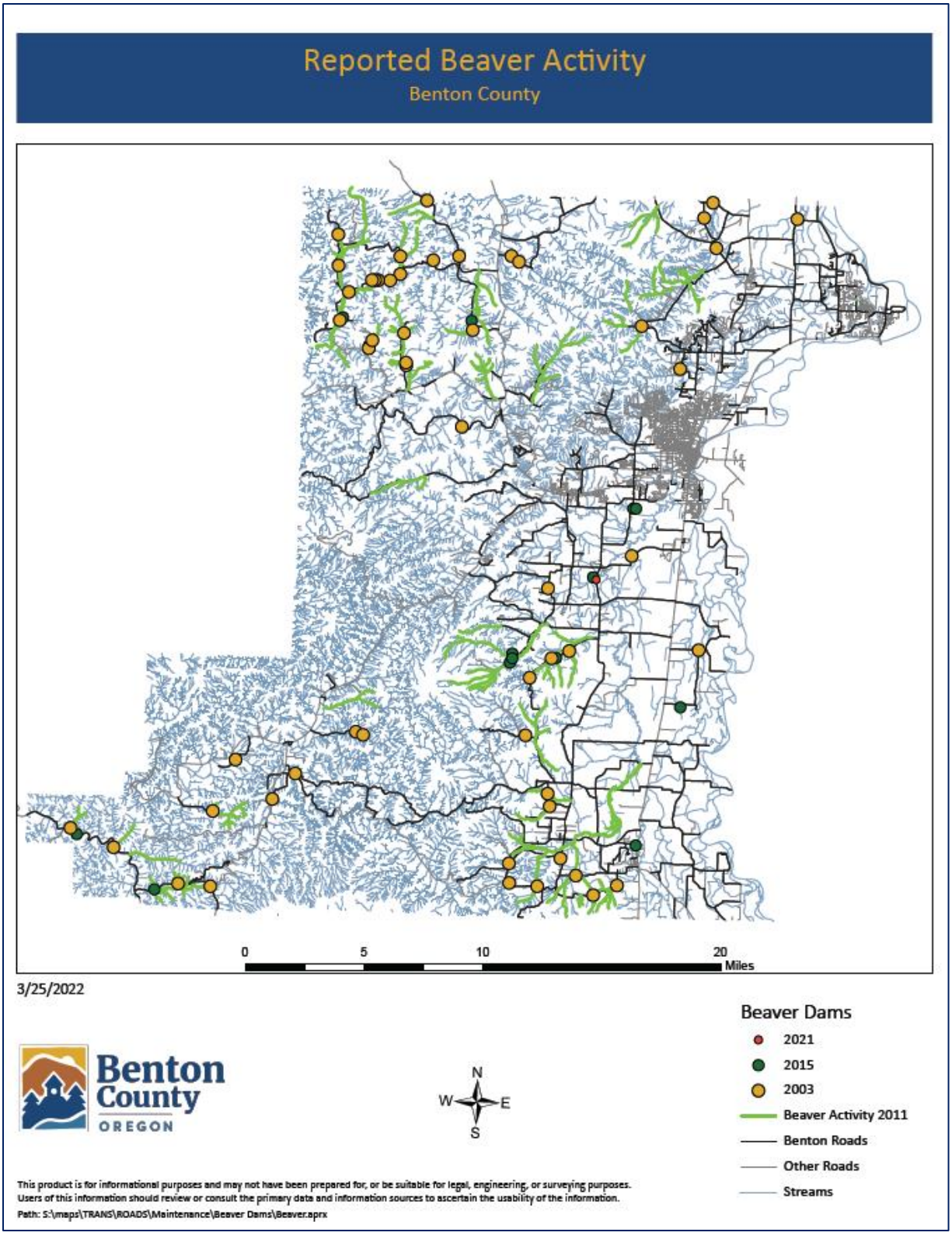
If a beaver dam must be removed, it should be done in a way that minimizes the likelihood of stranding fish, harming habitat, or adding sediment to the stream.

Remove the minimum amount of material in a slow, controlled manner to reduce risk of stranding fish. Use sediment control measures to prevent washing debris downstream.

Beaver dam material should be moved off-site or outside of the riparian area to prevent beavers from reusing it to build another dam.

ODFW must be notified if stranded fish are observed during dam removal.

[16] USFWS Beaver Restoration Guidebook



Beaver dams and reported activity in Benton County. Data collected 2003, 2011 (affected watershed areas), 2015, and 2021.

5.2.3 Culvert/Inlet Repair

This activity applies to replacement and repair of drainage structures in the same location, such as culverts (less than 3ft diameter) or slip-lining. This activity may include temporary water management.

- Culvert replacement may require a permit from USACE/DSL. Replacement and some repairs will require that fish passage, fish salvage and temporary water management be addressed. Engineering and Survey can assist with questions around this.
- Conduct work during the in-water work window when appropriate (this is not always necessary, for example, on cross drains).

6 STORMWATER MANAGEMENT [17]

6.1.1 *Description*

Stormwater management aims to reduce or eliminate pollution from waterbodies.

Activities in this section include cleaning of right-of-way and catch basins, erosion control, trapping winter sanding materials, managing and maintaining ditches, stormwater inlet (catch basin) cleaning, and curb and gutter cleaning.

6.1.2 *Mitigation, Avoidance and BMPs*

- Consider what stormwater management measures are required when altering impervious area or existing drainage.
- Promote sheet flow to leave the road where appropriate. This may include blading or grading to re-establish flow where stormwater is being concentrated.
- Prevent discharge to receiving streams and wetlands by plugging scuppers and weep holes on bridges, installing curbing to divert water off structures, installing check dams in ditch lines, or constructing sand traps.

6.2 Construction

Construction and redevelopment activities must comply with Benton County's OR DEQ MS4 and NPDES permits.

6.3 Catch Basin Cleaning

- All agencies and contractors performing vactor services for Benton County must utilize and document BMPs and submit records to Benton County including:

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[17] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 1

1. **Location**
2. **Date**
3. **Inspection report for all catch basins**

6.4 Curb and Gutter Cleaning

The City of Corvallis Public Works is contracted to sweep and vactor all curb and gutters within Benton County in order to reduce pollutants washed into stormwater conveyance systems.

- Track the location and timing of sweeping in the County's Asset Management System.
- Keep curb, gutter and stormwater infrastructure maps updated to provide maintenance details to agencies and contractors conducting street sweeping.

7 DITCH SHAPING AND CLEANING [18]

7.1.1 Description

This activity includes cleaning and reshaping ditches to maintain or improve drainage and loading, hauling and disposing of excess materials (such as vegetation or soil). This activity may be performed in all types of weather with various equipment.
(Appendix I: DSL Removal-Fill Guide, Ch. 2 'When is a permit required?')

7.1.2 Mitigation, Avoidance and BMPs [19]

- Conduct this work during dry weather and lowest stream flow. ODFW consult may be required in wet season or when silt devices cannot adequately filter water draining into waterways.
- Evaluate and modify existing ditch slopes to trap sediments (short term BMP) and support permanent establishment of vegetation (long term BMP).
- Use erosion control devices to prevent sediment discharge.
- When ditching to a waterway, leave a 25' buffer and apply an erosion control device at the beginning of the work zone to prevent leaching of sediment or water from the work site.
- When cleaning a ditch with a 10% or greater slope, install check dams every 300 feet.
- Re-seed drainage ditches and steep slopes as appropriate.
- Revegetation in Special Management Areas (SMAs) should be done with native seed or plants. [20]
- Do not leave materials where they can leach into a water body after a precipitation event.
- Use extreme caution to prevent fallback from entering wetlands and waters where no barrier or natural bench is present. [21]
- Dispose of excess or removed material at permitted disposal sites.
- Reuse excess materials where feasible.

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[18] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 7

[19] Appendix A: Erosion and Sediment Control Details (DET6106, RD1005, RD1006); In Water Work Period & ODOT Erosion Control Manual References; and Appendix G: ODOT Erosion Control Manual

[20] Section 20. Special Management Areas (SMAs); Oregon Native Plants for Erosion Control

[21] Appendix A: Erosion and Sediment Control Details (DET5100, DET5102, DET6001, RD1031)

7.2 Skip Ditching

- Protect water quality while cleaning and re-shaping roadside ditches. **Skip ditching** is a ditch maintenance process which leaves vegetation in place between areas of re-shaping so flowing water can be slowed and filtered before discharging into waterways.
- Divide lengths of ditch shaping into equal segments through the reach of a drainage ditch. Alternate segments between reshaping and leaving undisturbed vegetation.

Skip ditching in action along a rural roadway.

8 DUST ABATEMENT [22]

8.1.1 Description

Dust abatement includes the use of dust mitigation on non-paved road surfaces to temporarily stabilize soil and reduce dust during the dry season. Dust palliatives may include water, calcium magnesium acetate, magnesium chloride, or lignin sulfonates.

Dust palliatives are applied in liquid form at a maximum rate of one half gallon per square yard of surface. The rate is adjusted to be less as required to prevent puddling or runoff of the liquid solution from the road.

[22] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 26

8.1.2 Mitigation, Avoidance and BMPs

- When possible, prepare road surface prior to application of dust palliatives.
- Construct gravel berms at the low shoulders of the roadway to prevent liquid palliatives from entering waterbodies.
- **Do not apply dust palliatives within 72 hours of predicted precipitation event** (e.g. conduct this activity only before a three day forecast of sunny weather).
- Apply materials in accordance with the manufacturers' recommendations. Mix and utilize the *minimum amount needed* to prevent runoff and excess material.
- Use a 1' buffer zone on the edge of gravel if the road width allows.
- Use a 25' buffer zone near waterways or reduce application rate to prevent runoff.
- Carry spill protection and spill containment equipment.
- Use environmentally sensitive cleaning agents.
- Use all material or return to the supplier.
- **Use water alone when feasible as a primary dust palliative.**

9 EMERGENCY ROAD MAINTENANCE [23]

NOTE: **If archaeological sites are known to occur in the area and repair work isn't scheduled to begin for 30 days or more, archaeological surveys should proceed if necessary. Appropriate clearance documentation should be provided prior to proceeding with repair work.**

Work may require an archaeological monitor present during repair activities.

Under advisement of the Public Works Director, the Board of Commissioners determines if the event warrants a Declaration of Emergency to expedite repair work and approvals, and necessary environmental documentation/review is completed concurrently or after the fact.

The Public Works Director or County Engineer will decide if repair work must be halted to obtain necessary environmental or cultural clearances or if repair work must continue in which case clearances will be obtained concurrent with repair work or after the fact.

The Engineering Division assists with identifying environmental concerns, notifying regulatory agencies, coordinating other technical staff, and obtaining verbal approval or permits as required by the situation.

9.1.1 Description:

This activity restores and manages the transportation system in the event of natural and man-made emergencies while minimizing impact to environmental resources. It includes fixing damage to roadways, the roadside, and structures caused by storms, floods, and other events. **Failure to perform these activities may result in immediate threat to life, limb, or infrastructure.**

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[23] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 23

Emergency road maintenance ativities may include: extraordinary maintenance; use of riprap; pile installation; fish passage, screening, capture and removal; temporary access roads; erosion control and site management; and drilling and boring.

This activity may require in-water work, a USACE permit, a DSL permit, temporary water management, fish salvage, archaeological clearances, and/or review and compliance with NMFS review and processes. The emergency event may trigger coordination with ODFW on the fish passage laws.

NMFS and USFWS have defined a "Natural Hazard" as an event that creates a need for an immediate (or before the next in-water work window) repair to a road, culvert, bridge or utility line to prevent imminent loss of human life, property or natural resources.

9.1.2 Mitigation, Avoidance and BMPs:

- Proceed with work to protect public and staff safety of immediate concern.

- Repair damage to fish or water resources caused by county response in coordination with USACE, DSL, ODFW, NMFS, or USFWS as appropriate.

- Avoid and/or minimize impacts to wetlands or waterbodies.

- Provide adequate erosion control and bank stabilization.
- Identify and plan for slide material storage. Identify and map long and short-term material storage sites and obtain necessary environmental clearances. [24]
- Use alternatives to blasting in areas with ESA-listed or protected birds.
- Refer to current SLOPES (Standard Local Operation Procedures for Endangered Species) for additional information on Major Hazard Response and USFWS Major Hazard Response Programmatic Agreement.

Other federal clearances may also be required if federal reimbursement is expected to occur after the immediate emergency threat has been addressed.

9.2 Extraordinary Maintenance

This activity includes work which is atypical and required to maintain the transportation system under circumstances outside of the control of the County while making every effort to protect natural resources. Examples include military operations, fire response, bench cleaning, and broken water line repair and cleanup.

- Follow Erosion and Sediment BMP guidelines (Section 6 of this document) to ensure sediment and other materials do not enter wetland or waterbodies.

- Repair any damage to fish habitat caused directly or indirectly by County actions.

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[24] Appendix A. Erosion and Sediment Control Details (DET5100, DET5102)

9.3 Riprap – Emergency Installation

- Repair bank and bridge scours with riprap large enough to not become dislodged in high water events.
- Limit riprap to the amount of rock needed to retain structural integrity. If toe of slope must be established below the Ordinary High Water Line (OHWL).
- Above the OHWL, use appropriate size rock that is NOT open graded. Mix with soil when feasible in order to encourage plant growth.
- If riprap is used below the OHWL, use open grade rock.
- Place riprap from the top of back or bridge when possible.
- Place rocks individually whenever equipment, time, and safety allow.
- Taper riprap size and shape above the toe.
- Plant native vegetation in riprap below and above OHWL to top of bank.
- Incorporate large wood and other bioengineering elements into slope stabilization project when appropriate and feasible.

In situations where woody vegetation and large wood cannot be incorporated into riprap, coordinate with NMFS/USFWS on developing a mitigation plan that meets the scope, scale and effects of the repair. Some potential options include: removing unwanted vegetation from immediate area and replanting with appropriate vegetation or provide resources, equipment, and services to another organization for a restoration project.

9.4 Emergency Pile Installation

- In emergency situations where pile installation is required, use a vibratory hammer when available.
- Apply noise mitigation such as bubble curtains if required by permit.
- Use steel or untreated wood as pile. Use treated timber ONLY if other materials are not available and timber will be coated/sealed.
- **Document decision making process on the use of pile and BMPs.**

9.5 Fish Passage, Screening, Capture and Removal in Emergency Circumstances

In circumstances where a culvert or other hydraulic facility must be replaced and may involve fish passage, screening, capture and/or removal, contact the County Engineering Department directly.

9.6 Emergency Establishment of Temporary Access Roads

- Minimize the number and size of entry points or access into the work area.
- Consider using geotextile fabric to protect the ground and ease cleanup.
- When work is completed, the temporary access routes shall be obliterated, removed, or mitigated.
- Stabilize soil and restore vegetation if possible.

9.7 Erosion Control and Site Management in Emergency Situations [25]

NOTE: Work in this section is subject to Benton County's DSL, USACE, and/or OR DEQ 1200-CA permits. The County's 1200-CA permit requires compliance with the MS4 Program while conducting construction and maintenance activities in the County Right-of-Ways.

- Flag the boundaries of the clearing limits. Do not clear ground beyond the flagged area unless circumstances change.
- If vegetation in the riparian area must be cleared, trim at ground level (not grubbed) unless noxious weeds are present.
- Minimize damage to aquatic, riparian, and terrestrial vegetation without jeopardizing worker safety.
- Minimize erosion and sediment, as appropriate for site conditions, by installing erosion control measures prior to conducting the repair. This may include, if appropriate and safe, installing measures in-channel.
- Inspect erosion and sediment control measures daily to ensure adequate function.
- Mobilize work crews to make immediate repairs to erosion controls or to install erosion controls during work or off-work hours.
- Replace or fix ineffective BMP measures immediately.
- Remove erosion and sediment control devices after stabilization of the project and vegetation.

10 SIGNS, TRAFFIC SIGNALS AND ILLUMINATION [26]

10.1.1 Description

These activities may include washing, locating, installing, repairing and replacing signs, traffic signals or other items to ensure that they are functional and in good repair.

10.1.2 Mitigation, Avoidance and BMPs

- Use erosion and sediment control devices when activities may affect waterbodies.
- Use untreated timber or other nontoxic alternatives when installing new sign posts.
- Review the Special Management Areas section of this document, and the Benton County Habitat Conservation Plan for special BMPs when working in SMAs.
- Use upland areas with proper containment capacity for green concrete for truck chute cleanout.
- **Clean out shall not occur on or near waterbodies.**
- **Protect inlets, catchments, wetlands and waterways from green concrete.**
- Use environmentally-sensitive chemicals to the maximum extent practicable.

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[25] Appendix A: Erosion and Sediment Control Details

[26] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 14 2020 ODOT BMPs Section 14

11 FISH PASSAGE RESTORATION/IMPROVEMENT [27]

11.1.1 Description

Improves habitat conditions or fish passage while maintaining a safe and efficient transportation system. Activities include planting vegetation or placing large wood (e.g. logs or root wads) in or along a stream corridor. It also includes fish habitat restoration, enhancement and fish passage improvements.

NOTE: **Fish passage activities require a USACE permit, a DSL permit, temporary water management, fish salvage, and/or cultural resource clearance. Follow ODFW in-water work guidelines or as coordinated with ODFW, NMFS through the Engineering and Survey Department.**

11.1.2 This Activity Includes

- Installation and removal of culverts or the installation, removal, and repairs of baffles, weirs, or other systems within and adjacent to culverts for the purpose of improving fish passage.
- This activity may include the placement of large wood or other methods of fish passage improvement.

11.1.3 Mitigation, Avoidance and BMPs [28]

- Install erosion control devices, such as check dams, silt mats and other erosion and sediment control measures in a timely manner, including seeding and mulching with non-invasive species. Install silt fences and other devices as needed.
- Look for opportunities to plant vegetation on failing banks to slow roadbed deterioration and prevent sediment and pollutants from reaching nearby waterbodies.
- Place excess material above the Ordinary High Water Line (OHWL) where there is no opportunity for it to reach waterbodies or impact a wetland, unless otherwise directed by ODFW or NMFS.
- Stabilize material in a timely manner including spreading and top seeding; covering with matting or straw; or other erosion control and stabilization measures.
- Haul away and manage any material that cannot be stabilized above the OHWL.

12 FUELING

12.1.1 Description

This activity includes use of the diesel and gasoline fueling station located at Avery Maintenance Yard and refueling equipment out in the field. **Refuel equipment in the field at least 25 feet from waterbodies and follow Benton County vehicle fueling training and procedures.**

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[27] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 20

[28] ODOT Erosion Control Manual; and Appendix H: Temporary Water Management.

13 VEHICLE WASHING

13.1.1 Description

Equipment washing to ensure proper operation, function and safety of equipment and fleet vehicles.

13.1.2 Mitigation, Avoidance and BMPs

- Equipment will be washed in the covered wash rack area that contains an oil/water separator and settling vault. Water is discharged to a municipal sanitary sewer.
- Sediment in vault should be cleaned out quarterly or as needed.
- If any equipment must be washed outside of wash rack due to size, clean only the exterior (no engines or undercarriages) and use only clean water, no soap.

14 WATER QUALITY FACILITIES [29]

14.1.1 Description

This activity includes maintaining structures designed to contain stormwater runoff from county roads and facilities to ensure that these roads and facilities function as intended. Structures include detention and retention ponds, grassy swales, holding vaults, etc. and activities might include removal of sediment, vegetation, changing filter, periodic inspections or grading. Equipment used to maintain these structures include backhoes, vactors, jet rodders, handtools, etc. Specialty equipment may be used as needed.

14.1.2 Mitigation, Avoidance and BMPs [30]

- Dispose of excess or removed material at permitted disposal sites.
- Reuse excess materials where feasible.

15 GRAVEL ROAD MAINTENANCE

15.1.1 Description

Maintaining gravel roads includes restoring the roadway cross-slope, improving drainage, reshaping and smoothing existing surface material with a motor grader, and the placement of aggregate material on the road surface.

15.1.2 Mitigation, Avoidance and BMPs

- Perform this activity when adequate moisture is present in soil and aggregate.
- Use a five-pass process when grading: three cutting and mixing passes, then two lay-out passes.

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[29] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 11

[30] Appendix A: Erosion and Sediment Control Details

- Pull aggregate from the edge of road to center without going below the top of ditch.
- Place gravel four to six inches from top edge of foreslope when possible during layout.
- Keep crowns at 3% to 6% grade.
- When repairing potholes and washboarding, cut the material to a depth of 1 inch or below bottom of damaged area. Mix and lay-out material.
- Add gravel when necessary to restore road structure.
- If possible, use a roller to improve compaction.
- Utilize materials recommended by ODOT Standard Specifications whenever possible.
- Do not place rock on roads during freezing weather.
- When a gravel road intersects a paved road, modify the crown of the road 50 feet prior to the intersection to blend with the paved roadway. Push rock up to and onto the paved surface edge then back drag the material off.
- Install erosion control devices to protect sensitive resources as needed. [31]

16 GUARDRAILS AND CABLE BARRIERS [32]

16.1.1 Description

This activity involves repair, replacement, and cleaning of existing guardrail and cable barrier sections, including pouring concrete pads and placing concrete barriers. Cleaning includes the removal of material from under guardrail and around posts by hand or grader mounted cleaner.

16.2 Repair and Replacement

- Install erosion control measures in unstable areas to protect the downslope during guardrail/cable barrier replacement. [33]
- **Protect inlets, catchments, wetlands and waterways from green concrete. Green concrete is toxic to fish and wildlife and impossible to clean up once it has entered a waterway.**
- Match new guardrail with existing material including treated guardrail posts.
- Limit the use of creosote or other treated woods.

16.3 Cleaning

- Prevent material from entering streams or waterbodies.
- Pick up excess material rather than blading onto the bank when working near streams.
- Reuse recovered material when feasible.

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[31] Appendix A: Erosion and Sediment Control Details

[32] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 16

[33] Erosion and Sediment Control Details (DET5103, DET6007, DET6010, DET6012, RD1045, RD1050, RD1065)

17 HAZARDOUS MATERIAL SPILL MITIGATION [34]

NOTE: **If archaeological material is identified in the immediate vicinity of the spill, ensure the responsible party and their contractor are also notified.**

17.1.1 Description

Addresses work associated with hazardous materials abandoned, leaked or spilled. Work includes identifying, testing, removing, and disposing of the involved material and restoring the site as needed.

Benton County staff are not generally trained, equipped or authorized to perform hazardous material cleanup. Allow the responsible party or cleanup contractor to conduct emergency response actions and cleanup necessary to protect human health, safety, and the environment. Facilitate or assist as directed and certified.

The entirety of Benton County's spill prevention and response can be accessed here:
G:\avery\Public Works\Safety\Spill Plan

18 SHOULDER MAINTENANCE AND REPAIR [35]

18.1.1 Description

Shoulder maintenance and repair includes restoration of unpaved shoulder sections by adding, reshaping and compacting aggregate material. This activity is done to correct rutting and buildup of materials, to remove vegetation for safety, improve drainage and prevent standing water on roadways. Activities may include shoulder blading and rebuilding, erosion control and repair of erosion-related damage; and/or riprap placement.

18.2 Shoulder Blading and Rebuilding

- Determine if there is an existing barrier or natural bench to protect waterbodies from fallback material. This barrier must be above the Ordinary High Water Line (OHWL) with adequate width to prevent movement of material during weather events. [36]
- If a barrier or natural bench is not present, install approved erosion and sediment control measures such as check dams in roadside ditches. [37]
- Blade while moisture is still present in substrate but not during the wettest part of the year.

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[34] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 25
[35] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 4
[36] Appendix A: Erosion and Sediment Control Details (DET5100, DET5102, DET6001, RD1031)
[37] Appendix A: Erosion and Sediment Control Details (DET5103, DET6007, DET6010, DET6012, RD1005, RD1006, RD1045, RD1050, RD1065)

- Evaluate the width of the blading activity and modify if needed to minimize disturbance to vegetation.
- Evaluate sites for alternatives to blading such as berming or paving shoulder.
- Take care to prevent slope failure from overly-steep ditch slopes or reduced ditch capacity.
- Treat paved shoulders the same as unpaved shoulders.
- Sweep gravel away from salmon habitat and flowing streams within 25 feet.
- Permanently stabilize soils using seeding, plants, etc. [38]

18.3 Erosion Repair

- **This activity may require permits from USACE, SSL, or DEQ.**
- **This activity may also involve temporary water management, fish salvage, or impact habitat for protected species.** [39]
- Consider the use of bio-engineering solutions where practical. [40]
- Replace riprap during ODFW in-water work periods except during an emergency.
- Place excess material at appropriate sites above the Ordinary High Water Line (OHWL) where there is no opportunity for material to reach wetlands or other resources.
- U**ncover the minimum amount of soil necessary for each phase of the repair.**
- Install erosion and sediment control measures as soon as possible where erosion is likely to occur. [41]
- Plant vegetation or reinforce failing banks to prevent roadbed deterioration and reduce sediment and pollutant transport. [42]

19 SLIDES AND SETTLEMENTS [43]

19.1.1 Description

This activity includes slide and settlements repair by placing fill and removing material to proactively restore the roadway to prevent a catastrophic failure. This work is done to prevent emergency when a road is in danger of collapse.

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[38] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET5102, DET6017, DET6101, DET6102, DET6103)

[39] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET5102, DET6017, DET6101, DET6102, DET6103)

[40] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET5102, DET6017, DET6101, DET6102, DET6103)

[41] Appendix A: Erosion and Sediment Control Details

[42] Appendix A. Erosion and Sediment Control Details (DET5100, DET5101, DET5102, DET6017, DET6101, DET6102, DET6103)

[43] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 24

19.1.2 Mitigation, Avoidance and BMPs

Under advisement of the Public Works Director, the Board of Commissioners determines if the event warrants a Declaration of Emergency to expedite repair work and approvals, and necessary environmental documentation/review is completed concurrently or after the fact.

The Public Works Director or County Engineer will decide if repair work must be halted to obtain necessary environmental or cultural clearances or if repair work must continue in which case clearances will be obtained concurrent with repair work or after the fact.

The Engineering Division assists with identifying environmental concerns, notifying regulatory agencies, coordinating other technical staff, and obtaining verbal approval or permits as required by the situation.

This activity may require a USACE permit, a DSL permit, temporary water management, fish salvage, archaeological clearance, and review and/or compliance with NMFS review and processes as described in Section 9: Emergency Maintenance. The event may trigger coordination with ODFW regarding fish passage requirements and habitat regulations. [44]

- Avoid or minimize additional impacts to wetlands or waterbodies. Mitigation may be required.
- Provide adequate erosion control or bank stabilization to protect water quality.
- Identify and plan for material storage as appropriate. Map long and short-term material storage sites and ensure necessary clearances for wetland, sensitive species, and archaeological impacts have been secured. [51]
- Prioritize bioengineering and fish and wildlife friendly solutions.
- Consider alternatives to blasting in areas with ESA-listed or protected birds, if emergency allows.
- Significant changes to the topography or vegetation of a riparian area must be coordinated with Benton County Engineering and regulatory agencies.
- Follow in-water work guidelines.
- Place excess material above the OHWL where there is no opportunity for material to reach wetlands or waterways.
- Install erosion control measures in a timely manner in areas where erosion is likely to occur, including seeding and mulching areas with non-invasive species. [45]
- If a USACE permit or DSL permit is required or the event may qualify for ER reimbursement, see Section 9: Emergency Maintenance for additional BMPs to be implemented to meet USACE requirements and to comply with the current version of SLOPES.

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[44] Appendix A: Erosion and Sediment Control Details (DET5100, DET5101, DET5102, RD1045, RD1050), Appendix F: In Water Work Period & ODOT Erosion Control Manual References, Appendix G: ODOT Erosion Control Manual, and Appendix H: Temporary Water Management

[45] Appendix A: Erosion and Sediment Control Details

20 SNOW AND ICE MITIGATION [46]

20.1.1 Description

Removes snow and ice from the roadway while protecting natural resources. This includes sanding and/or removal of snow, ice, and slush from roadways using a snow plow, grader, loader or snow blower.

20.1.2 Mitigation, Avoidance and BMPs

- Reduce plowing speed in sensitive areas.
- Adjust blower chute to minimize blowing into sensitive areas where feasible.

20.2 Sanding

This activity involves applying abrasive material (sand) to roadway surfaces to assist with traction for safer driving, while protecting water quality and fish habitat in nearby waterbodies.

- Carefully consider using sanding material in the following areas: a) those with dust related air quality problems, and b) where there is danger of siltation in streams, shallow lakes or ponds.
- Store sanding material in a manner to minimize contamination of surface or groundwater.
- Covered storage for sanding material is preferred.
- Reduce speed when applying abrasives to minimize bounce and scatter.
- **Keep accurate application records including when, where, and quantity of sanding material** used.
- Place barriers in specific locations to capture sanding material, such as along streams or areas that drain directly to waterbodies. [47]
- Identify and create facilities to capture sanding material where opportunities present themselves.

21 STOCKPILES [48]

21.1.1 Description

Store stockpile materials (such as rock, sanding material, etc.) in a secure manner that minimizes impacts to natural and cultural resources.

Stockpiles should only be placed in permitted areas unless in case of emergency.

21.1.2 Mitigation, Avoidance and BMPs

- **Develop site plans and/or implement erosion control plans for areas in proximity to riparian areas, waterbodies, or wetlands. The plan should identify erosion and sediment control needs and ensure stability of the stockpiled material.**
- Review the appropriate procedures for management, reuse or disposal of stockpiled materials.

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[46] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 22

[47] Appendix A: Erosion and Sediment Control Details (DET5103, DET6012, RD1010, RD1015, RD1030, RD1031, RD1032, RD1033).

[48] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 2

22 STRIPING AND LEGEND MARKING [49]

22.1.1 Description

This activity includes maintaining traffic markings including painting traffic lines, arrows, bike lanes, crosswalks, etc. Materials may include paint or durable products containing glass beads to provide retroreflectivity. These activities are conducted on paved surfaces during dry weather conditions. Pavement preparation may include grinding off old markings (generally less than 10%).

22.1.2 Mitigation, Avoidance and BMPs

- Use environmentally safe products when available.
- Contact the **County Safety Officer** or hazardous waste contractor prior to disposal of stripe grindings as they may be categorized as hazardous waste.
- Contain all waste from equipment clean outs and dispose of and store appropriately.

23 SURFACING [50]

23.1.1 Description

These activities are intended to repair the road base, surfaces, and shoulder to preserve a safe driving surface. These activities are performed on asphalt, concrete, and chip seal surfaces. Activities also include producing pavement materials (concrete, asphalt, chip rock), using grinding materials, deep base digging, site de-watering, fog sealing, filling voids (slab jacking), grinding and crack sealing. Nearby waterways should be protected from potential pollutants associated with surface work (such as asphalt, concrete, and release agents).

23.1.2 Mitigation, Avoidance and BMPs

- Have materials for spill containment on site.
- Capture and contain all excess materials when cleaning equipment in the yard or in the field.
- Prevent release agents and material from escaping the top of the pavement. Use limited amounts of release agents and/or capture material as necessary.

23.2 Pavement Production and Surface/Deep Base Repair

- Avoid working near populations of listed plants, wetlands, riparian corridors, or known archaeological resources as possible.
- Use commercial asphalt plants whenever feasible.

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[49] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 13

[50] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 3, Benton County Spill Prevention and Response Plan (G:\avery\Public Works\Safety\Spill Plan)

- Use upland areas for truck chute cleanout and properly contain green concrete and asphalt. Do NOT clean out over waterbodies, in wetlands or within Special Management Areas (SMAs).
- **Green concrete is toxic to fish and wildlife and impossible to clean up after it has entered a water body.** Protect inlets and catchments using appropriate containment.
- Perform surface work in dry weather to minimize any runoff of potentially hazardous material.

23.3 Release Agents

- Do not use diesel fuel as a releasing or cleaning agent (except for the use of diesel as required in closed distributor bar systems).
- Use only products marketed as release agents, and use environmentally sensitive products when possible.
- For areas without engineered wash rack systems with oil/water treatment, capture the material released using plastic, sand blankets, or drip pans, etc.
- Capture, contain, or retain excess material on the pavement when cleaning equipment in the field using products containing release agents.
- Recycle or dispose of release agents and materials as directed by the Material Safety Data Sheet (MSDS) or as per the manufacturer's directions.
- Use heat sources to warm and clean tack nozzles during operations.
- Carry emergency spill kits with absorbent materials (diapers, kitty litter, shovels, etc.) to keep materials out of waterbodies.

23.4 Void Filling

- If the void is connected to a waterbody, use foam or other quickset material designed for use in water to plug the void prior to using concrete to prevent concrete from entering the waterbody.
- Utilize erosion control and spill prevention practices as necessary.

23.5 Chip Sealing

- **Use any practical means to prevent rock from entering streams.**
- Chip seal in dry weather only.
- Cover scuppers and drains prior to chip sealing on or near bridge decks.
- Remove excess gravel on bridge decks.
- Pick-up or sweep gravel away from waterbodies within 25 feet of work area.

23.6 Pavement Grinding and Saw Cutting

- Keep stockpiled grinding material removed from roadways away from drain inlets, drainage ditches and watercourses.
- Old asphalt or concrete must be recycled or disposed of as approved by County Engineer.
- AC grindings, pieces, or chunks used in embankments or shoulder material must not be allowed to enter any storm drains or watercourses.
- Install a silt fence until permanent controls are in place.
- Apply temporary perimeter controls such as inlet protection until cleanup is complete.
- Do not allow saw-cut Portland Concrete Cement (PCC) slurry to enter storm drains or watercourses.

- Residue from grinding/saw cutting operations shall be collected and contained and not allowed to flow across or be left on the surface of the pavement.
- Collect pavement dig-out material by mechanical or manual methods.

24 SWEEPING AND FLUSHING [51]

24.1.1 Description

This activity includes removing materials such as sand, dirt, or non-hazardous debris from the road surface or shoulders while preventing sediment and pollutants from reaching waterbodies. Includes non-pickup and pickup sweeping and flushing of roadways. These activities are performed year-round.

24.1.2 Mitigation, Avoidance and BMPs

- Prevent materials from entering wetlands and waterbodies.
- Dispose of sweepings offsite to prevent impacts to natural resources.

24.2 Non-Pickup Sweeping and Flushing

Materials are sidecast (not recovered) under this activity.

- Schedule sweeping during damp weather to minimize dust production. If sweeping cannot be done during damp weather, use water to reduce dust as needed.
- If the road is parallel to a waterbody less than 25 feet from the fog line, slow the sweeper and broom speed and change the angle of the broom to prevent sweepings from entering the waterbody.

25 VEGETATION MANAGEMENT [52]

25.1.1 Description

This activity includes management of noxious weeds and unwanted vegetation around County roadways and infrastructure, including hand cutting of trees or brush, mechanical mowing and limbing, and herbicide application.

25.1.2 Mitigation, Avoidance and BMPs

- Avoid cutting if you see a nest in a tree.
- Employ erosion and sediment control measures if there is potential for sediment to enter a waterbody.
- Consider leaving downed trees for habitat restoration or bio-engineering projects.

📖 [51] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 5 & 6

📖 [52] 2020 ODOT Routine Road Maintenance Water Quality and Habitat Guide BMPs Section 12

- When mowing in riparian corridors, limit mowing to no more than 12 feet off pavement edge unless needed to maintain road function.

25.2 Hand Cutting Trees and Brush

- Remove vegetation up to 10 feet beyond guardrails to maintain visibility.
- Maintain shade trees along watercourses.
- Brush may be cut within 20 feet of either side of or under bridges.
- Only cut brush necessary to perform required maintenance.
- Trees or snags on or near a roadway/bridge that are weakened, unsound, undermined, leaning, or may fall across a roadway as exceptions to the above BMP.
- If trees providing shade or bank stabilization within 50 feet of watercourses are determined to be a risk to public safety as defined above, the trees will be removed. **Mature trees (greater than 12 in. diameter at breast height) removed will be replaced at a 2:1 ratio within the same watershed.**
- Leave cut brush in place whenever possible if it does not interfere with sight distance, drainage or safety.
- Vegetation control in Special Management Areas is addressed in **Section 25** of this document.

25.3 Mechanical Mowing and Limbing

- The tractor must be inspected and greased daily.
- Check the mower head twice daily on warm or hot days for wire or vegetation wrapped around it.
- Fill out the vehicle inspection sheet daily.
- Travel at the speed you are most comfortable with while mowing; production will increase with experience.
- Spring mowing consists of 1-2 passes of the mower head (3'-6'). At reduced site distance locations, multiple passes may be required. Utility locates are not always necessary during spring mowing except where Right-of-Way is narrow and utilities are close to the road. The aim is to keep grasses cut short.
- Fall and winter mowing include multiple passes with a focus on brush removal and overhanging limbs. **Utility locates are required.**
- **Do not cut or limb in landscaped areas, even in the Right-of-Way.** This requires hand cutting and attempts be made to talk with the property owner in advance.
- When cutting limbs, try to mulch vegetation as much as possible. Otherwise, return to area at the end of the work day and remove limbs/brush from roadway and ditch-line.
- Hand cutting low limbs will always improve the look of your job and keep larger debris off roadway.
- Mowing around bridges and guardrails should occur during each rotation.
- Do not lift mower head over the top of signs. **Pull mower head in and around signs to reduce the chance of damaging them.**
- Any damage to signs, pedestals, power poles, etc. must be reported to the office.
- Notify Road Manager about property damage or issues with citizens by the end of the work day.
- Row mowing does not mean to cut everything in reach. Use good judgment.

- Maintain a 2’ buffer around all aboveground utilities.
- Limited mowing (3’-6’) from the edge of pavement should occur April 1 through October 1.
- Mechanical brush cutting of backslope and low-hanging limbs should occur from October 1 through March 31st.
- Remove vegetation up to 10 feet beyond guardrails to maintain visibility.

Vegetation control in Special Management Areas is addressed in Section 25.

25.4Herbicides [53]

25.4.1 Broadleaf Application

- **Application of broadleaf herbicides will occur between May and October 15th.**
- **DO NOT apply herbicides in front of schools, bus stop waiting areas, driveways, field entrances or permitted no-spray areas or where persons are present.**
- Herbicide application will be spot treatment only with the focus on noxious weed control.
- Herbicides will not be applied within 25’ of stream OHWL to protect water resources and sensitive fish species.
- Hand spraying herbicide is allowed within 25’ of bridges IF: 1) removing vegetation is critical to the function of the structure 2) rain is not forecasted in the timeframe outlined on the herbicide label 3) an aquatic-approved herbicide is used.
- Any application on or over waterways will be with an approved aquatic herbicide only.
- Apply herbicides in accordance with EPA labels (this includes weather criteria and disposal of empty container).
- The herbicide truck will carry current Material Safety Data Sheets (MSDS) and labels of herbicides used in operation.
- **Keep records of** application date, amount of pesticide applied, location of application, temperature and wind-speed at the beginning and end of application.

Vegetation control in Special Management Areas is addressed in Section 25 of this document.

25.4.2 Shoulder Application

- **Shoulder application of herbicides will occur April 1-June 30.**
- 2’- 6’ of rock shoulders will be kept free of vegetation through the use of a foliar-active and/or soil residual herbicide. Typically this will be 2’ for local roads, 4’ for collector roads and 6’ for arterial roads, depending on shoulder width.
- Treat under and around guardrails to minimize vegetation growth.
- Application of herbicides will cease 25’ prior to crossing over a listed stream.
- Herbicides will be used in accordance with EPA labels including weather criteria and disposal.
- **DO NOT apply herbicides in front of schools, bus stop waiting areas, driveways, field entrances or permitted no-spray areas or where persons are present.**
- Carry current Material Safety Data Sheets (MSDS) and labels of herbicides used in operation.

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[53] Benton County Spill Prevention and Response Plan (G:\avery\Public Works\Safety\Spill Plan)

- A record-keeping system will be maintained that documents: date, amount applied, location, temperature and wind-speed at the beginning and end of application. This information will meet or exceed Oregon Department of Agriculture requirements.
- **Application will occur April 1-June 30.**
- EXCEPTION: Identified test areas being evaluated for impacts associated with vegetative shoulders.

26 SPECIAL MANAGEMENT AREAS (SMAs)

26.1.1 Description

Management of designated Right-of-Ways where plants covered under Benton County's Prairie Species Habitat Conservation Plan (HCP) occur.

This activity may include mowing, cutting, thinning or removing tree stumps, chemical treatments (herbicides), restrictions near Fender's blue butterfly habitat and protected plant species.

Protected plants include:

COMMON NAME	OREGON CONSERVATION STATUS	FEDERAL CONSERVATION STATUS
Kincaid's lupine	Threatened	Threatened
Peacock larkspur	Endangered	Species of Concern
Bradshaw's lomatium	Endangered	Threatened
Nelson's checkermallow	Threatened	Threatened
Willamette daisy	Endangered	Endangered

In addition to the protected plants, two butterfly species are part of Benton County's HCP:

COMMON NAME	OREGON CONSERVATION STATUS	FEDERAL CONSERVATION STATUS
Fender's blue butterfly	Endangered	Endangered
Taylor's checkerspot butterfly	On Threatened and Endangered Species List	Endangered

26.1.2 Mitigation, Avoidance and BMPs

- **Upon confirmation of a new presence or populations of protected plants within a Right-of-Way, Benton County must designate a new SMA, notify ODA and apply signage within 60 working days.**
- To prevent the spread of noxious weeds and non-native plants, all equipment (hand tools, vehicles and heavy machinery) should be cleaned to remove mud and debris prior to entering the site.
- Human activities (including walking) within SMAs will be limited to minimize potential negative effects to Covered Species.
- Vehicle use should be minimized to reduce damage or mortality to covered plants and butterflies.
- Soil disturbance should be avoided to the maximum extent possible during road maintenance.
- Projects should minimize alterations to hydrology.
- Weed-free products should be used whenever possible.
- Re-vegetation of disturbed areas should be done with native grass/forb seed mixes or transplants.

- Vegetation control will be maintained in "sight distance zones" (areas required to be kept clear of obstructing vegetation for safety reasons), despite the presence of Covered Species.
- Woody plant and noxious weed encroachment should be minimized.

26.2 Mowing

- **Mowing will occur during the fall and winter (August 15 - February 28)**, after T&E plant species are outside of their active growth periods for the year.
- Set the mowing deck a minimum of 15 cm (6 in) above the ground to prevent unnecessary damage to protected plant species.
- Mowing or driving on non-paved surfaces should be avoided when soil is saturated to minimize compaction and rutting. If mowing must occur, use of rubber tracked equipment is preferred.
- **Spring mowing is only allowed where necessary to control a weed infestation involving a weed species reproduced mainly by seed (e.g., meadow knapweed), in which case up to ½ of the covered plant population may be mowed in an effort to control seed set.**
- No flail mowers will be used.

26.3 Tree Cutting/Thinning and Stump Removal

- **This activity should be conducted when Covered Species are in less sensitive life stages (August-February). During the flowering season, strong precautions should be used (e.g., marking with posts and flagging).**
- Handheld power tools may be used to remove woody vegetation.
- **No trees will be removed from Fender's blue butterfly habitat during the flight season (March-June)**, unless a tree is deemed a hazard and immediate removal is required.
- Stump removal will occur only during dry periods.
- All cut material will be piled or chipped and spread away from any protected plants or hauled off-site for disposal.
- If activities occur during the wet season, tree debris may be left on site away from the covered plant species, until the dry season when equipment can access the work area to remove the debris.

26.4 Chemical Treatment

- Herbicides will be applied by a licensed applicator using appropriate equipment and BMPs.
- Minimize exposure of non-targeted species to herbicide spray, drift, leaching or runoff.
- Follow labeled restrictions, including limitations for use near water. [54]
- Use the lowest effective nozzle pressure and minimum height recommended by the manufacturer.
- Droplet size shall be at least 500 microns.
- Do not apply herbicides when winds exceed 11 km (7 mph) or the wind limits specified by the manufacturer.
- Spray only when temperatures are below 30° C (85° F).
- Drift retardant adjuvants may only be used for boom spray applications, and must be non-toxic and applied under the above strict application requirements.
- Dyes may be used for applications to ensure complete and uniform application and to observe the amount of drift.

📖 [54] Appendix E for a table of acceptable herbicides for use in Special Management Areas.

- The entirety of Benton County's spill prevention and response can be accessed here: G:\avery\Public Works\Safety\Spill Plan

26.4.1 Chemical Restrictions near Fender's Blue Butterfly

Research indicates that populations of Fender's blue larvae do not appear to be significantly damaged by some herbicides such as glyphosate, pendimethalin, imazapic, or fluazifop under field application conditions **when herbicides are applied in September-November (Clark et al. 2004).** This may be because the larvae are buried in leaf litter and shielded from direct contact with these herbicides.

- **See Benton County spill prevention and response plan in the case of improper herbicide application or emergencies.**
  G:\avery\Public Works\Safety\Spill Plan
- For non-tested herbicides, broad scale application will be limited to a portion of the occupied habitat (areas with Kincaid's lupine that may host larvae) during the season when larvae are buried under leaf litter.
- The area allowed for herbicide application will be less in smaller populations. **Note restrictions on approved Herbicide Table, Appendix E of this document.**

26.4.2 Chemical Restrictions near Nelson's checkermallow

In some cases, Nelson's checkermallow does not go completely dormant in the fall and winter. Use of herbicides when this species is present requires additional precautions. As of 2022, there are sixteen Special Management Areas containing Nelson's checkermallow, including five 'Type 1' SMAs.

- Plants must be shielded from herbicide drift or overspray with buckets, tree protection tubes, or other suitable material or method of application. **Application should be by hand (e.g., backpack sprayer wand) when spraying within 2 m (6 ft.) of Nelson's checkermallow plants**.

- Exceptions to this include herbicides that do not harm Nelson's checkermallow (such as grass-specific herbicides) and wipe-on applications that target other species and do not result in drift. **These exceptions are noted in Appendix E of this document and the Benton County HCP Table J.1.**

LIST OF APPENDICES

Appendix resources are cited in their entirety below, with a link to the online version of the document, where available. The relevant sections of the larger documents from which these materials are gathered are also provided as printable, PDF versions.

Appendix A

Oregon Department of Transportation. 2022. **Erosion and Sediment Control Details.** https://www.oregon.gov/odot/Engineering/Pages/Standards.aspx

Appendix B

Oregon Department of Transportation. 2020. Routine Road Maintenance: Water Quality and Habitat Guide Best Management Practices. **Appendix F: Pesticide-Treated Wood**. https://www.oregon.gov/odot/Maintenance/Documents/blue_book.pdf

Appendix C

Oregon Department of Transportation. 2020. Routine Road Maintenance: Water Quality and Habitat Guide Best Management Practices. **Appendix I: Beaver Dam Modification Flowchart**. https://www.oregon.gov/odot/Maintenance/Documents/blue_book.pdf

Appendix D

Oregon Department of Transportation. 2020. Routine Road Maintenance: Water Quality and Habitat Guide Best Management Practices. **Appendix D: NMFS Fish Screen Criteria.** https://www.oregon.gov/odot/Maintenance/Documents/blue_book.pdf

Appendix E

Benton County. 2010. Prairie Species Habitat Conservation Plan. **Appendix J: Prairie Habitat Vegetation Management Guidelines (Table J.1: Approved Herbicides).** https://www.co.benton.or.us/sites/default/files/fileattachments/nature_areas_and_parks/page/2382/benton_county_prairie_species_hcp.pdf

Appendix F

In Water Work Period

Summarized from: ODFW. 2022. **Oregon Guidelines for timing of in-water work to protect fish and wildlife resources**. https://www.dfw.state.or.us/lands/inwater/Oregon%20In-water%20Work%20Guidelines%20January%202022.pdf?msclkid=6c7719e8a6c511eca3ff1bf4749751a8

ODOT Erosion Control Manual References

Oregon Department of Transportation. 2020. Routine Road Maintenance: Water Quality and Habitat Guide Best Management Practices.

Vegetative Buffers: **Pages 37-39**
Seeding: **Pages 39-49**
Straw/Mulch/Mats: **Pages 49-53, 57-62**

Appendix G

Oregon Department of Transportation. 2019. **ODOT Erosion Control Manual.** https://www.oregon.gov/odot/GeoEnvironmental/Docs_Environmental/Erosion_Control_Manual.pdf

Appendix H

Oregon Department of Transportation. 2014. ODOT Hydraulics Manual. **Chapter 18: Temporary Water Management.** https://www.oregon.gov/ODOT/GeoEnvironmental/Docs_Hydraulics_Manual/Hydraulics-18.pdf

Appendix I

Oregon Department of State Lands. 2019. **A Guide to the Removal-Fill Process. Chapter 2: When is a permit required?** https://www.oregon.gov/dsl/WW/Documents/Removal_Fill_Guide.pdf

ADDITIONAL RESOURCES

Clark, D., Blakeley-Smith, M., Hammond, P., Johnson, D., Kaye, T., Kelpsas, B., ... & Wilson, M. (2004). Control of *Brachypodium sylvaticum* and restoration of rare native upland prairie habitat at Butterfly Meadows, Benton County. *Final Report to Oregon State Weed Board and Oregon Department of Agriculture, Salem*.

IMAGE CREDITS

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