

## **6.0 Impact Avoidance and Minimization Measures**

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## 6.0 Impact Avoidance and Minimization Measures

### Chapter Summary

- Performance standards are observable or measurable benchmarks for a particular performance objective against which a project can be compared. If the standards are met the related performance objectives are considered to have been fully achieved. Performance measures must be something quantifiable; measures, not actions that are: 1) achievable and 2) capable of being monitored. Performance standards may only be applied on some projects.
- Performance standards are often established for projects lacking detailed designs (i.e., projects undertaking consultation early in design). Examples of Performance standards are provided below:
  - Performance Measure or Goal #1. Minimize harm and harassment to listed salmonid species due to degradation of water quality during in-water work activities.
    - Performance Standard #1.1. Water quality in the Puyallup River will meet the State's Water Quality Standard at a point 300 feet downstream during in water work as determined by a monitoring program. If an activity results in non-compliance with this standard, work causing the effect will be immediately stopped and corrective actions taken.
- Conservation measures are activities or measures that help recover listed species. Conservation measures may only be identified or recommended for some projects.
  - An example of a conservation measure would include implementing research or surveys of unsurveyed habitat in other portions of a watershed or other areas in a species' range to determine occupancy, life history information, etc. or contribution of funds toward habitat enhancement projects intended to improve baseline conditions for a particular species.
- Minimization measures (MMs) are measures that reduce the impact of a project on listed species or habitats. Minimization measures can be precautionary measures implemented by the federal action agency to minimize or eliminate project effects on listed and sensitive species and habitat, or they can include avoidance and preservation measures such as timing restrictions or buffers around sensitive habitat types and habitat

features that are important to sensitive species. Minimization measures apply to all projects.

- Best management practices (BMPs) are methods, facilities, built elements, and techniques implemented or installed during project construction to reduce short- and long-term project impacts on listed and sensitive species and habitat. BMPs are applied for all projects.
- Minimization measures and BMPs are measures that are considered part of the proposed action that will be implemented. They are not recommendations or suggestions.
- MMs and BMPs can be defined to minimize impacts associated with specific project activities or techniques.
  - Examples of activity-specific measures include erosion control features for earthwork activities (BMP), replanting of areas where vegetation removal or grading has occurred (MM), infiltration features for stormwater runoff in projects adding new impervious surface area (BMP), and mitigation plans for wetland impacts (MM).
- MMs and BMPs can be defined to minimize potential impacts on species and habitat.
  - Examples of habitat- or species-specific measures include timing restrictions (MM), exclusion of listed species from the work area (MM), noise shields (BMP), and avoiding riparian vegetation removal (MM).
- MMs and BMPs should be compiled into the Impact Avoidance and Minimization section of the BA. This section should include MMs and BMPs addressing specific construction elements, as well as impact minimization measures for particular species and critical or suitable habitats.
- MMs and BMPs that are consistent with WSDOT standard specifications can be easily incorporated into project contract documents.
- MMs and BMPs that are not consistent with WSDOT standard specifications must be incorporated as special provisions into contract documents. The project biologist should coordinate with project designers and engineers to ensure that these additional provisions are feasible. The project biologist should work with project designers to ensure that special provisions are incorporated into contract documents.

This chapter defines and explains minimization measures (MMs) and best management practices (BMPs) and explains where to discuss them within a BA. The chapter provides an overview of common construction activities for which impact minimization measures may be required, general considerations for developing appropriate impact minimization measures for construction activities, guidance for developing impact minimization measures for sensitive species and habitats, and examples of appropriate enforceable wording for MMs and BMPs extracted from BAs.

The chapter is organized as follows:

- The first section of the chapter defines MMs and BMPs and discusses the differences between them.
- The second section explains where a project biologist should include discussions of MMs or BMPs within a BA, as well as two preferred options for compiling these impact minimization measures to facilitate federal review of the BA and also to facilitate incorporation of the required measures into the contracts administered for a project.
- The third section provides an overview of construction activities that may require impact minimization measures, followed by a more detailed discussion of three specific project activity types. This discussion outlines general considerations for assessing impacts and appropriate ways to minimize these impacts. The last subsection provides examples of MMs and BMPs that address in-water work impacts, and includes a BA excerpt that illustrates how one project biologist defined specific project activities, associated impacts, and specific impact minimization measures.
- The fourth section discusses the importance of considering additional species- and habitat-specific impact minimization measures. The first subsection addresses MMs for particular species and illustrates, in a BA excerpt, the timing restrictions developed for one project. The second subsection addresses MMs and BMPs for minimizing impacts on sensitive habitats. Examples of specific MMs and BMPs are provided for sensitive aquatic and terrestrial habitats.

## 6.1 Impact Minimization Measures and Best Management Practices

MMs and BMPs are precautionary measures intended to minimize environmental impacts associated with proposed project activities or elements. These measures can target impacts associated with specific project activities or techniques, as well as potential impacts on species and habitat. MMs and BMPs are not merely recommendations; they are measures included in the

proposed action, to be implemented throughout project planning, design, and construction in order to minimize environmental impacts. The Services cannot consult on recommendations, only known project elements or measures that will be implemented.

MMs are most frequently avoidance or preservation measures of some kind, for example, timing restrictions or buffers around sensitive habitat types and habitat features that are important to sensitive species. BMPs are methods, facilities, built elements, and techniques implemented or installed during project construction to reduce short- and long-term project impacts. The nature of MMs and BMPs vary according to physical and environmental conditions of the project site, different phases of the project, and the activities for which they are intended. MMs and BMPs are developed for implementation during the permitting, design, and construction phases of projects.

Typically, the BA is developed concurrently with the design of a new project. During this process, it is critical for the biologist writing the BA and engineers designing the project to stay in close communication throughout preliminary and final design. The project biologist relies on the design engineers for accurate project description detail (e.g., project areas and construction techniques). Based on this information, it is the biologist's responsibility to identify MMs and BMPs for the project in conjunction with the design and project engineers. The project engineer must approve all of the MMs and BMPs to ensure that the MMs and BMPs can be implemented and are included in the contract.

MMs and BMPs are effective only if they are clearly communicated to the contractor responsible for construction of the project. To construct a project, the contractor relies entirely on the construction plan sheets, WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT 2004a), and supplemental special provisions. Some MMs and BMPs are partially or wholly covered in the standard specifications, but many are not and need to be incorporated by the design engineers into the construction plan sheets and the special provisions. Some MMs are conditions attached to permits, such as a Clean Water Act Section 404 permit, a Section 401 water quality certification, or a hydraulic project approval. All permits must be attached to the construction plans and referred to in the special provisions so that the contractor is familiar with them. To the extent possible, these permit conditions should be specified in the special provisions.

After the BA receives concurrence from the Services, all MMs and BMPs need to be finalized in the construction plans and special provisions. After final design, the construction plans and special provisions are advertised so that contractors can bid on the project. The contractor selected for the project is responsible to carry out only what is specified in construction plans, standard specifications, and special provisions. For this reason, it is critical that all necessary MMs and BMPs are clearly described in the BA. If they are missing or unclear, there is a risk that the contractor may perform activities that harass threatened or endangered species, damage critical habitat, or damage suitable habitat for listed species.

The following sections of this chapter contain many examples of MMs and BMPs that have been used on projects in the past and are currently used for projects that comply with the

*Programmatic Biological Assessment for the Washington State Department of Transportation Eastern Washington Regions – Working Document (WSDOT 2004b), and the No Effect and Not Likely to Adversely Affect Programmatic Biological Assessment Working Document for NOAA Fisheries Listed Species (WSDOT 2002).*

## **6.2 Where to Include Minimization Measures and Best Management Practices within a BA**

MMs and BMPs should be compiled into a single section of the BA that includes measures addressing specific construction elements as well as impact minimization measures for particular species and critical or suitable habitats. Activity-specific measures are usually defined first in the BA development process, then species- or habitat-specific measures are defined later.

If the general term *BMPs* is used in a BA, the specific impact-minimization activities intended by the project biologist in using this term should be described in the report, so that the Services understand the exact measures that will be taken to reduce potential project impacts. For example, if a BA states, “during construction, BMPs will be implemented to ensure that impacts on the adjacent stream are minimized,” the project biologist should describe these practices in detail (e.g., all disturbed areas will be replanted or reseeded within 30 days).

Because impact minimization measures can be included in two distinct sections of a BA, it is important to compile all of these measures in a single location, for two reasons: 1) to facilitate review of the final effect determinations and their rationale, and 2) to ensure that all measures identified in a BA are clearly specified in documents conveyed to the contractor implementing the project. A compilation of impact minimization measures can be effectively provided in a list of all impact minimization measures identified in the report (activity-specific, as well as species- or habitat-specific), to be included in the Impact Avoidance and Minimization Measures section of the BA.

## **6.3 Developing Appropriate Impact Minimization Measures for Specific Construction Activities**

### **6.3.1 Overview of Common Construction Activities**

Some of the most common activities associated with construction and operation of transportation projects include the following:

- Grading, cutting, or filling
- Vegetation removal or clearing
- In-water work activities
- Highway runoff treatment

- Activities that increase the timing and duration of noise above ambient levels (e.g., pile driving and blasting)
- Sediment removal
- Road, bypass, or interchange construction and maintenance
- Pavement patching, repair, painting, and crack sealing
- Sweeping or cleaning
- Guardrail installation
- Slope repair
- Shoulder widening
- Roadside landscaping
- Ditch or channel maintenance
- Wetland mitigation
- Riparian revegetation or restoration
- Culvert and inlet repair, replacement, extension, or installation
- Stream bank stabilization
- Bridge removal and construction, structural bridge repair, and scour repair
- Debris removal or relocation
- Bioswale construction

### **6.3.2 General Considerations for Minimizing Activity-Specific Impacts**

Two of the most common transportation-related construction activities listed above are discussed below in more detail (grading, cutting, or filling; and vegetation removal). These examples illustrate types of impacts and general impact minimization approaches a project biologist might consider in selecting specific MMs and BMPs for the proposed project. A similar list of impacts and general impact-minimizing measures or practices could be developed for any of the specific activities listed above.

#### **6.3.2.1 Grading, Cutting, or Filling**

To adequately address earthwork activities (grading, cutting, and filling) in a BA, the extent of these activities should be quantified. Specific details should be provided regarding the size and type of fill to be placed, the location of fill in relation to nearby water resources, the methods and locations of soil removal and disposal, and methods of soil stabilization after grading or filling is

complete. The placement of fill or the disturbance soils within areas containing salmon-bearing streams can have several impacts, including but not limited to the following:

- Introduction of additional impervious or semi-impervious surface area to the riparian system
- Introduction of additional potentially erodable materials to the system
- Alteration of hydrodynamics within the system
- Suspension of sediments in nearby water bodies.

Some examples of general approaches that might be considered to minimize impacts associated with projects requiring grading and filling activities include but are not limited to the following:

- Placement of a no-construction buffer around wetlands and sensitive riparian habitats
- Avoidance of grading or placement of fill adjacent to fish-bearing streams or wetlands
- Straw placement, hydroseeding, or planting of newly disturbed sites to minimize erosion
- Placement of erosion control features (e.g., hay bales or silt fences) surrounding newly disturbed or filled sites.

The following examples of MMs developed for projects requiring filling illustrate how to word MMs appropriately:

MM 1. Fill material shall be placed, not randomly dumped.

*The intent of this MM is to minimize impacts on sensitive fish habitat within streams and rivers associated with placement of rock for filling scour holes or making barbs. To ensure that rock is carefully placed in streams and rivers, the design should incorporate language similar to the following within the site work sections of the special provisions: Contractor will place rock by hand or employ machine placement in areas designated in the drawings.*

MM 2. Temporary fills must be entirely removed and the site restored to preexisting conditions.

*The intent of this MM is to ensure that temporary fills are removed and the site is restored so that potential impacts on sensitive areas (such as erosion and sedimentation, changes in drainage paths, compaction, settlement, etc.) are not permanent.*

*This MM is not specifically addressed in the standard specifications and should be incorporated into construction plans and special provisions. For example, if a temporary access road is placed in a wetland, instructions should be provided for the contractor to remove all road materials and restore the area (i.e., restore soils and native vegetation).*

*If soil compaction is an issue, the contractor could be required to decompact affected areas by ripping to a depth of at least 12 inches, regrading, and recompacting to a specified maximum density. This is most important where the work includes plantings, because root growth is inhibited by densely compacted soils. To define acceptable levels of density and compaction limits, it is prudent to obtain a sample of the site soils and perform laboratory testing to determine the moisture-density relationship. Otherwise, a conservative specification for the compaction limit is 85 percent of the soil's maximum dry density as determined by test method ASTM D698.*

### **6.3.2.2 Vegetation Removal and Clearing**

To adequately address vegetation removal or clearing activities, the BA should quantify the extent of vegetation removal and clearing activities proposed for each phase of the project, or for the project as a whole. The trees to be removed as part of a project also should be quantified in terms of acreage or number of trees, and described by species and diameter-at-breast-height (dbh) class, if possible. If riparian vegetation is removed as part of the proposed action, the amount and type of riparian vegetation to be removed should be measured, and its stream shading, bank stabilization, and food web contribution functions should be assessed. For wetland vegetation to be removed, the area should be quantified, and the ecological functions (as they relate to listed species) lost as a result should be considered in the assessment of project impacts.

The general impacts associated with vegetation removal or clearing activities include but are not limited to the following:

- Removal of trees (indicate whether they are suitable or unsuitable habitat)
- Removal of riparian vegetation
- Wetland impacts
- Introduction of noxious weeds or exotic species
- Ground or soil disturbance or compaction
- Increased bank or soil erosion
- Sedimentation
- Noise impacts

- Human presence or activity impacts
- Impacts on prey species.

Some general approaches that the project biologist might consider to minimize impacts associated with these activities include the following:

- Where riparian vegetation has been removed from aquatic resources, isolate disturbed areas using erosion control features (such as silt fencing or hay bales) until disturbed areas are stabilized or revegetated
- Replant areas with native vegetation, or hydroseed disturbed sites, to prevent soil erosion
- Cut vegetation at the ground surface rather than grubbing, which removes the roots.

The following examples of MMs developed for projects requiring vegetation removal illustrate how to word MMs appropriately:

- MM 3. Boundaries of clearing limits associated with site access and construction limits will be flagged to prevent ground disturbance outside the limits.

*The intent of this MM is to confine work activities to nonsensitive areas, or minimize the amount of disturbance in sensitive areas.*

*There is language within the standard specifications that covers this in general.<sup>1</sup> However, the drawings still must clearly depict the areas to be protected. If it is critical, the drawings and special provisions should include a requirement for the contractor to delineate these areas using temporary high-visibility fencing.*

*To ensure that unintended disturbance does not occur in sensitive areas, the design should incorporate language similar to the following within the*

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1. Section 1-07.16 of the standard specifications – *Protection and Restoration of Property: The contractor shall protect private or public property on or in the vicinity of the work site. The contractor shall ensure that it is not removed, damaged, destroyed, or prevented from being used unless the contract so specifies. . . . If the engineer requests in writing, or if otherwise necessary, the contractor shall install protection, acceptable to the engineer, for property (land, utilities, trees, landscaping, ... and other property of all description whether shown on the plans or not).*

Section 1-07.16(2) – *Vegetation Protection and Restoration: Existing vegetation, where shown in the plans or designated by the engineer, shall be saved and protected through the life of the contract. The engineer will designate the vegetation to be saved and protected by a site preservation line and/or individual flagging.*

In Section 2-01.1, the areas to be cleared and grubbed are limited by the following statement: *The contractor shall clear, grub, and clean up those areas staked or described in the special provisions. This work includes protecting from harm all trees, bushes, shrubs, and other objects to remain.*

Section 2-01.3(1) – *Clearing: The contractor shall protect, by fencing if necessary, all trees or native growth from any damage caused by construction operations.*

*site work sections of the special provisions: “Contractor will install temporary high-visibility fencing to demarcate and protect sensitive areas. No work, including placement or stockpiling of fill materials, will be performed within these areas. When it is no longer needed, or at the engineer’s direction, contractor will completely remove and dispose of temporary high-visibility fencing.”*

*The sensitive areas should also be delineated on the drawings, along with a note containing a similar statement regarding installation of high-visibility fencing and the need to protect these areas.*

*Because the standard specifications do not include installation or material requirements for temporary high-visibility fencing, the designer should include provisions for temporary high-visibility fencing installation and materials.*

- MM 4. Vegetation will be grubbed only from areas undergoing permanent alteration. No grubbing will occur in areas slated for temporary clearing followed by revegetation.

*The intent of this MM is to minimize disturbance and to allow vegetation to grow back in temporary impact areas.*

*See comment for MM 3.<sup>2</sup>*

- MM 5. Disturbed areas will be restored to pre-project conditions, using native plant species that are endemic to the project vicinity or region.

*The intent of this MM is to ensure that areas temporarily disturbed are adequately restored.*

*For areas that are designated to not be disturbed, their restoration is covered in the standard specifications.<sup>3</sup> These areas should be specifically delineated on the drawings (see above comments). However, for areas disturbed in the course of the work, this MM is not specifically addressed in the standard specifications. The construction drawings and special provisions should incorporate appropriate restoration requirements for each disturbed area. This may include a planting plan that identifies each location and native plant species to be planted in disturbed or temporary impact areas.*

*To ensure that plants successfully mature, a monitoring and maintenance plan should be implemented after construction. The standard*

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2. Section 2-01.3(2) of the standard specifications – *Grubbing: The contractor shall grub all areas indicated by the engineer or by the special provisions.*

3. Section 1-07.16(1), 4th paragraph: *If the contractor (or agents/employees of the contractor) damage, destroy, or interfere with the use of such property, the contractor shall restore it to original condition.*

*specifications have a requirement for plant establishment.<sup>4</sup> However, if desired, the designer should incorporate any critical or special procedures, as required by permit conditions, for monitoring after construction, submitting monitoring reports to permitting agencies, and implementing maintenance measures, as necessary.*

- MM 6. Removal of riparian vegetation will be minimized to the greatest extent possible. Native riparian vegetation will be replanted where feasible. Vegetation restoration will be coordinated with [insert the appropriate agency name].

*The intent of this MM is to minimize impacts on riparian areas.*

*This MM is addressed in the previously noted sections of the standard specifications, but without specific reference to riparian habitat. Although the standards list WDFW requirements for replanting stream bank or shoreline plants that are disturbed,<sup>5</sup> the requirement to minimize impacts on riparian areas is not specifically addressed in the standard specifications.*

*This MM should be incorporated into the construction plans and special provisions by clearly designating where vegetation will be preserved (see MM 3) in riparian areas. In addition, this MM should be incorporated into the planting plans by designating the locations and species of native plants to be planted in riparian areas.*

### **6.3.3 In-Water Work: Impact Minimization Approaches**

#### **6.3.3.1 General Considerations for In-Water Work**

In-water work activities include but are not limited to pile installation, bank stabilization, pile removal, bridgework, stream or ditch realignment work, and culvert replacement. The construction methods or techniques employed in each of these activities have impacts that are unique to their application. Common impacts include sedimentation, impacts on substrate (spawning beds and cover), and direct mortality of fish.

In-water work methods and their impacts should be carefully researched and described by the project biologist. A BA should document the specific construction techniques, materials, and impacts of the proposed action in relation to the listed species and habitats occurring in the

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4. Section 8-02.3(13) – *Plant Establishment*: Plant establishment shall consist of caring for all plants planted on the project and caring for the planting areas within the project limits. This section also requires that the contractor prepare and submit a first year plant establishment plan for approval.

5. Section 1-07.5(2) of the standard specifications – *State Department of Fish and Wildlife*: The contractor shall replant any stream bank or shoreline area if the project disturbs vegetative cover. Replanted trees, brush, or grasses shall resemble the type and density of surrounding growth, unless the special provisions permit otherwise.

project action area. To minimize these impacts, MMs tailored to the construction methods must be developed and included in the BA. This topic is discussed more completely in PART 2, IN-WATER WORK.

General approaches that should be considered by the project biologist to minimize impacts of in-water activities include but are not limited to the following:

- Avoid in-water work if feasible, or conduct it only during approved in-water work windows.
- Divert streamflow during in-water work to minimize turbidity.
- Use bioengineered solutions where feasible.
- Perform work during low flow or dry conditions, or during dry weather.
- Isolate the area of in-water work from the water body to minimize sediment impacts (using cofferdams, silt fencing, hay bales, or water sausages), and pump sediment-laden waters to an infiltration or treatment site.
- Isolate the work area to avoid impacts on listed fish species, and remove fish from the area if necessary (using seining, netting, and as a last resort, electrofishing). WSDOT now has a fish handling protocol that has been approved by the Services.
- Dispose of debris or sediments outside the floodplain.
- Clean the activity site after construction to prevent an influx of sediments to streams after the first large storm event.
- Minimize impacts on stream banks and riparian vegetation.

### 6.3.3.2 *Examples of MMs and BMPs: In-Water Work*

The following examples of MMs and BMPs developed for projects requiring in-water work illustrate how to word MMs or BMPs appropriately:

- MM 7. Work below the ordinary high water mark (OHWM) will be conducted during the in-water work window listed in the hydraulic project approval (HPA) issued by WDFW and approved by USFWS and NOAA Fisheries.

*The intent of this MM is to avoid impacts on fish when they are most likely to be present in a natural water body where work is proposed.*

*This particular MM is covered in a very general way by the standard specifications.<sup>6</sup>*

*Seasonal restrictions on work in water bodies are rules that WDFW adds as conditions in HPAs. These seasonal restrictions need to be incorporated into the special provisions.*

- MM 8. Either the in-water work area will be isolated from the rest of the water body and surrounding riparian areas, or flows will be diverted around the area of construction using appropriate features (e.g., filtration fencing, water saucages, or cofferdams).

*The intent of this MM is to avoid or minimize turbidity impacts on fish and habitat downstream of the construction area.*

*The standard specifications have provisions that cover the intent of this MM.<sup>7</sup> The designer should review these requirements and augment as necessary within the special provisions.*

- MM 9. Work will not inhibit passage of any adult or juvenile salmonid species throughout the construction period or after project completion.

*The intent of this MM is to avoid interfering with the migration and rearing activities of salmonids.*

*Because the standard specifications do not allow for blocked fish passage, an HPA permit is necessary to override this specification. Conditions of the HPA should be referenced in the special provisions.*

- MM 10. All concrete will be poured in the dry, or within confined waters not connected to surface waters, and will be allowed to cure a minimum of 7 days before contact with surface water.

*The intent of this MM is to prevent concrete from increasing the pH of natural water bodies by allowing concrete to fully cure prior to contact with water.*

*The standard specifications cover placement and curing of concrete from a quality control standpoint rather than an environmental protection*

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6. Section 1-07.5(1) of the standard specifications – *General – Fish and Wildlife and Ecology Regulations: Throughout the work, the contractor shall comply with all current rules of the state Departments of Fish and Wildlife, and Ecology.*

7. Section 1-07.5(2) of the standard specifications – *State Department of Fish and Wildlife: The contractor shall never block stream flow or fish passage.*

Section 2-09.3(3)A – *Preservation of Channel: When foundations or substructures are built in or next to running streams, the contractor shall excavate inside cofferdams, caissons, or sheet piling unless dredging or open pit excavation is permitted. Contractor shall never disturb the natural stream bed next to structure.*

standpoint.<sup>8</sup> However, there is a provision that prohibits discharge to the environment of water used for curing.<sup>9</sup>

*The standard specifications do not indicate the minimum time necessary before concrete can contact surface water. This information should be added to the special provisions. For additional protection, the designer should consider requirements for rinsing the freshly cured concrete prior to allowing it come into contact with surface waters.*

- MM 11. Sediment-laden water generated during construction will be pumped to an infiltration site or to an upland settling area, where it is subsequently treated and sediments are consolidated prior to returning water to streams. Sediments will then be removed and disposed of in accordance within Washington Department of Ecology requirements. Discharge of water back to streams will occur in such a manner as not to cause erosion.

*The intent of this MM is to protect streams from turbidity impacts associated with sediment-laden runoff.*

*The standard specifications generally prevent the discharge into state waters of any material that contains sediment.<sup>10</sup> Additional specific requirements for water pollution control are found in Section 8-01 Erosion Control and Water Pollution Control.<sup>11</sup> Ground water encountered within excavations shall be treated before being discharged.<sup>12</sup>*

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8. Section 6-02.3(6) – *Placing Concrete: When a foundation excavation contains water, the contractor shall pump it dry before placing concrete. If this is impossible, an underwater concrete seal shall be placed that complies with Section 6-02.3(6) B.*

9. Section 6-02.3(11) – *Curing Concrete: Concrete shall cure for a minimum of 3 days and as long as 14 days depending on the type of concrete and curing method. Water used to cure the concrete shall not be allowed to run off and enter any lakes, streams, or other surface waters.*

10. Section 1-07.5(3)4 of the standard specifications: *Dispose of, in ways that will prevent their entry into state waters, all toxicants (creosote, oil, cement, concrete, and equipment wash water) and debris, overburden, and other waste materials.*

11. Section 8-01.3(1): *Controlling pollution, erosion, runoff, and related damage requires the contractor to perform temporary work items including but not limited to 1) providing ditches, berms, culverts, and other measures to control surface water; 2) building dams, settling basins, energy dissipaters, and other measures, to control downstream flows; 3) controlling underground water found during construction; or 4) covering or otherwise protecting slopes until permanent erosion-control measures are working.*

12. Section 8-01.3(1) C: *When ground water is encountered in an excavation, it shall be treated and discharged as follows:*

*1) When the ground water meets state water quality standards, it may bypass detention and treatment facilities and be rerouted directly to its normal discharge point at a rate and method that will not cause erosion.*

*2) When the turbidity of the ground water is similar to the turbidity of the site runoff, the ground water may be treated using the same detention and treatment facilities being used to treat the site runoff, and then discharged at a rate that will not cause erosion.*

*Otherwise, this MM is not specifically addressed in the standard specifications. If a project site has a viable upland area for treatment or infiltration, this MM should be incorporated into the special provisions and design drawings as an option. The designer should also pay attention to the physical nature of the sediment/turbidity to determine the feasibility of settlement as a treatment method. The contractor also may prefer to use other treatment methods.*

- MM 12. All culvert replacements and fishways will be designed in accordance with the WDFW *Design of Road Culverts for Fish Passage* (WDFW 2003) and *Fishway Design Guidelines* (WDFW 1992).

*The intent of this MM is to provide culverts that are fish-passable during all seasons of the year.*

*Typically, culvert design is performed by the designer and fully incorporated into the contract drawings and special provisions, in which case this MM does not pertain to the contractor. In the case of temporary culverts installed for diversions or other purposes, the design may or may not be performed by the contractor. If the contractor performs culvert design, this MM should be incorporated into construction plans and special provisions and approved by WDFW in the HPA permit.*

- MM 13. Prior to entering the water, all equipment will be checked for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials. Washwater will not be discharged to any water body without pretreatment to state water quality standards.

*The intent of this MM is to prevent pollutants from entering natural water bodies and affecting fish or habitat.*

*The standard specifications provide general requirements to prevent pollutants from entering state waters,<sup>13</sup> along with two specific*

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3) When the turbidity is worse than the turbidity of the site runoff, the ground water shall be treated separately until the turbidity is similar to or better than the site runoff before the two may be combined and treated, using the same detention and treatment facilities being used to treat the site runoff, and then discharged at a rate that will not cause erosion.

13. Section 1-07.5(2) of the standard specifications – *State Department of Fish and Wildlife: The contractor shall not degrade water in a way that would harm fish. (Criteria: Washington state water quality regulations.)*

*requirements for keeping equipment out of state waters<sup>14</sup> and preventing the discharge of equipment washwater into state waters.<sup>15</sup>*

*However, if in-water work is to be conducted, the special provisions should be augmented to require that the contractor inspect equipment for leaks and faulty parts (especially hydraulic lines, fittings, and cylinders) and clean the equipment each day or shift that the equipment is to enter the water. Additionally, the designer should add language to the special provisions to require that all equipment operating in state waters contain biodegradable, nontoxic, vegetable-based hydraulic oil rather than petroleum-based hydraulic oil.*

- MM 14. All equipment entering waters containing bull trout will use vegetable oil or other biodegradable, acceptable hydraulic fluid substitute.

*The intent of this MM is to prevent hydraulic fluid spilling into and polluting natural water bodies in the event of an accidental release due to equipment leakage or hydraulic component failure.*

*This MM is not addressed in the standard specifications and should be incorporated into construction plans and special provisions (see comments under MM 13).*

- MM 15. Culvert cleaning and repair will occur in the dry or when listed or proposed fish are not likely to be present.

*The intent of this MM is to avoid disturbance to fish in the vicinity of culverts during cleaning and repair activities.*

*Culvert cleaning MMs are not addressed in the standard specifications. If culvert cleaning is included in a contract, this MM language should be incorporated into the special provisions.*

- MM 16. Every effort will be made to perform culvert cleaning activities from the top of the bank.

*The intent and implementation of this MM is similar to MM 15. This MM is not addressed in the standard specifications and should be included in the special provisions as necessary (see the comments under MMs 13, 14, and 15).*

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14. Section 1-07.5(2)7: *Keep all equipment out of any flowing stream or other body of water, except as may be permitted by the special provisions.*

15. Section 1-07.5(3) – *State Department of Ecology: In doing the work, the contractor shall ... dispose of, in ways that will prevent their entry into state waters, all ... equipment wash water....*

- MM 17. Every effort will be made to install riprap and other materials from the banks or outside the wetted perimeter.

*The intent of this MM is to minimize disturbance to fish and habitat within natural water bodies.*

*This MM is not addressed in the standard specifications and should be incorporated into construction plans and special provisions, as necessary.*

- MM 18. All materials (such as riprap) placed within the water will be prewashed to remove sediment and other contaminants.

*The intent of this MM is to prevent pollutants from entering natural water bodies and affecting fish or habitat.*

*This MM is not addressed in the standard specifications and should be incorporated into construction plans and special provisions.*

- MM 19. All dredged or excavated materials will be removed to an upland location where they cannot enter any water body.

*The intent of this MM is to prevent pollutants such as sediments or contaminated sediments from entering water bodies and affecting fish or habitat.*

*The standard specifications have a few requirements that may meet the intent of this MM,<sup>16</sup> although the specific location of upland disposal is not covered. Specific details related to this MM should be incorporated into construction plans and special provisions.*

- MM 20. Construction barges will not be beached.

*The intent of this MM is to prevent barge-related impacts on beach substrates and vegetation.*

*While the standard specifications require the contractor to submit a plan detailing barge locations used for some activities,<sup>17</sup> this does not fulfill the*

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16. Section 1-07.5(2) of the standard specifications – *State Department of Fish and Wildlife: The contractor shall dispose of any project debris by removal, burning, or placement above high-water flows.*

Section 1-07.5(3) – *State Department of Ecology: In doing the work, the contractor shall ... dispose of, in ways that will prevent their entry into state waters, all ... debris, overburden, and other waste materials.*

Section 2-09.3(3)A – *Preservation of Channel: When foundations or substructures are to be built in or next to running streams, the contractor shall ... remove any excavation material that may have been deposited in or near the stream so that the stream bed is free from obstruction.*

17. Section 6-02.3(25)N – *Prestressed Concrete Girder Erection*, and Section 6-03.3(7)A – *Erection Methods: The contractor shall submit a plan that shows location of barges.*

*intent of this MM. Therefore this MM should be incorporated into the special provisions.*

- MM 21. Construction barges will not be anchored in or above eelgrass or kelp beds, and drill rigs will not operate in or above eelgrass or kelp beds.

*The intent of this MM is to prevent damage to eelgrass and kelp beds as a result of shading or disturbance by anchors or drilling equipment.*

*Because the intent of this MM is not covered by the standard specifications, this measure should be incorporated into the special provisions. All known locations of eelgrass and kelp beds should be delineated on the drawings with a reference note incorporating this MM.*

## **6.4 Developing Appropriate Impact Minimization Measures for Sensitive Species and Habitats**

The listed species and habitats present in the vicinity of a project also determine the specific impact minimization measures to be implemented. Frequently, habitat- or species-specific conditions (e.g., restrictions on distance of construction from streams, stream crossing measures, timing restrictions, or noise shields) must be established to support the effect determination for the habitat or species.

The following sections provide explanations of MMs and BMPs developed for sensitive species and also for sensitive habitats. In addition, an example of timing restrictions is provided in a BA writing sample. Compiled lists of common MMs and BMPs illustrate impact minimization measures for selected sensitive habitats.

### **6.4.1 Impact Minimization Measures for Sensitive Species**

If a sensitive species is present or could occur within the project action area, a project biologist may define measures and practices to avoid or minimize project impacts. Two of the most common measures defined to protect sensitive species and ensure given effect determinations are 1) timing restrictions, or 2) excluding or removing the species of concern from the area where impacts are anticipated.

Consider the following project example: Suitable marbled murrelet nesting habitat surrounds a paving project that has an action area confined to the developed portion of a roadway and the area within 60 meters of the roadway to account for noise related impacts. The project is scheduled for construction during the breeding season (April 1 through September 15). It is likely that this project would adversely affect marbled murrelet due to noise and visual impacts. However, if the timing of the project is altered, such that project activities will take place between September 15 and March 31 (outside the breeding season), the potential impacts could

be avoided, because murrelets would not utilize the stand outside the breeding season. In that case the project could receive a determination of *no effect* (NE). Similarly, BMPs related to specific equipment or techniques might be required in order to minimize the construction-related noise associated with the project.

Where more than one listed species may be present, timing restrictions must be developed to accommodate the sensitive periods for all potentially affected species. Project biologists should always consult calendars showing sensitive periods for particular species to determine appropriate project timing. Note that timing restrictions must be approved by the project office. If timing restrictions proposed by the project biologist are not feasible, formal consultation may be necessary.

Timing of construction in or near water bodies is dictated by the in-water work windows required in an HPA permit or by the area habitat biologist. NOAA Fisheries or USFWS may have different in-water work windows defined for different species and water bodies. Therefore, it is important to consult with WDFW and the Services to ensure that the proper in-water work window is cited. Calendars of sensitive periods for listed species are provided in PART 3, WILDLIFE SENSITIVE PERIODS CALENDAR.

If an incidental *take* permit is issued by the Services for a project, reasonable and prudent measures (RPMs) likely are stipulated by the Services. These specific measures must be incorporated into the contract to ensure that the project complies with the RPMs, and that impacts to the listed or proposed species are minimized to the greatest extent possible.

#### **6.4.1.1 Exclusion or Removal of Species of Concern from Project Area**

Exclusion or removal of listed wildlife species from the vicinity of a project should always be conducted by a trained wildlife or fisheries biologist to ensure that the risk of injury to wildlife is minimized. Because handling listed wildlife or affecting its behavior by preventing access to its customary habitat could constitute a *take* under the Endangered Species Act, often the preferred option for reducing impacts on the species is to establish timing restrictions on construction.

The following example of a MM developed for projects requiring fish exclusion for in-water work illustrates how to word MMs or BMPs appropriately.

MM 22. All fish will be removed from the work area prior to any in-water work activities. Salmonid removal methods, listed in preferential order, are as follows: establishing a net enclosure around the work area, dispersal of salmonids through snorkeling, use of seine nets, dewatering of salmonid habitat, or netting of individuals. Electrofishing will be used as the last resort to remove any remaining fish.

*The intent of this MM is to avoid stranding and potential mortality of fish within construction sites.*

*Although Section 1-07.5(2) of the standard specifications states that any stranded fish are to be released, it includes no requirements for specific fish removal methods. This MM should be incorporated into construction plans and special provisions.*

#### **6.4.2 Impact Minimization Measures for Habitats Associated with Sensitive Species**

If a sensitive habitat type (e.g., designated critical habitat, suitable habitat, or aquatic resource) could potentially sustain impacts, a project biologist may need to define MMs and BMPs to minimize impacts on those habitat characteristics upon which listed species depend. The following section provides examples of MMs and BMPs that could be used to minimize impacts of proposed activities on sensitive aquatic and terrestrial habitats.

Properly worded MMs and BMPs use committing or obligatory language to emphasize that they are required conditions to be implemented during project construction.

##### **6.4.2.1 Examples of MMs and BMPs: Sensitive Aquatic Habitat**

Some common MMs and BMPs for transportation-related projects occurring near sensitive aquatic resources are provided below:

MM 23. Construction impacts will be confined to the minimum area necessary to complete the project.

*The intent of this MM is to minimize impacts on the natural environment, including sensitive areas.*

*The standard specifications do not address this MM in the general manner stated above. This MM should be incorporated into construction plans and special provisions by clearly showing areas where no impacts are allowed (see MM 3).*

MM 24. A spill prevention, control, and containment (SPCC) plan will be developed for the project to ensure that all pollutants and products are controlled and contained.

*The intent of this MM is to prevent pollutants from entering natural water bodies.*

*The standard specifications require that an SPCC plan be developed,<sup>18</sup> approved, and implemented throughout the duration of the project. The*

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18. Section 1-07.15(1) of the standard specifications – *Spill Prevention and Countermeasures Plan: The contractor shall prepare a project specific spill prevention, control, and countermeasures (SPCC) plan to be used for the duration of the project. The plan shall identify staging, storage, maintenance, and refueling areas and their relationship to drainage pathways, waterways, and other sensitive areas. The plan shall identify spill prevention and containment methods to be used at each of these locations.*

*SPCC plan can be developed by the engineer for the contractor to adopt during construction, although normally the contractor is responsible for developing and implementing the plan.*

- MM 25. No contractor staging areas will be allowed within 91 meters (300 feet) of any jurisdictional wetland, stream, river, or drainage as identified by the project biologist, unless site-specific review by the project biologist indicates that no impacts on sensitive resource areas will occur due to topography or other factors.

*The intent of this MM is to prevent materials from leaving the staging area and entering sensitive areas. For example, erosion of soil piles in staging areas could cause sediment-laden runoff to drain into sensitive areas. The distance specified may be project-specific.*

*This MM is not addressed in the standard specifications and should be incorporated into construction plans and special provisions.*

- MM 26. A temporary erosion and sedimentation control (TESC) plan and a source control plan will be developed and implemented for all projects requiring clearing, vegetation removal, grading, ditching, filling, embankment compaction, or excavation. The BMPs in these plans will be used to control sediments from all vegetation-disturbing or ground-disturbing activities.

*The intent of this MM is to prevent or minimize drainage of sediment-laden water into sensitive areas.*

*The standard specifications have provisions for a TESC plan but do not make it mandatory.<sup>19</sup> The designer has two options to ensure that a TESC plan is developed and implemented for the project: 1) the designer may develop a TESC plan in the special provisions and drawings, in which case the contractor is required by the standard specifications to either adopt or prepare an appropriate TESC plan, or 2) the designer may replace the first sentence in 8-01.3(1)A “Submittals” with the following: “The contractor shall prepare and submit a TESC plan for the engineer’s approval.”*

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19. Section 8-01.3(1)A of the standard specifications – *Submittals – Erosion Control and Water Pollution Control*: *When a TESC plan is included in the project plans, the contractor shall either adopt or modify the existing TESC plan. The contractor shall obtain the engineer’s approval on the TESC plan and schedule before any work begins.*

Section 1-07.15 – *Temporary Water Pollution/Erosion Control*: *The contractor shall perform all temporary water pollution and erosion control measures shown in the plans, specified in the special provisions, proposed by the contractor and approved by the engineer, or ordered by the engineer as work proceeds. In an effort to prevent, control, and stop water pollution and erosion within the project, thereby protecting the work, nearby land, streams, and other bodies of water, the contractor shall perform all work in strict accordance with all federal, state, and local laws and regulations governing waters of the state, as well as permits acquired for the project.*

- MM 27. For projects involving concrete pouring, concrete truck chute cleanout areas will be established to properly contain wet concrete and washwater.

*The intent of this MM is to ensure that concrete construction activities occur in designated areas away from sensitive areas.<sup>20</sup>*

*Designated areas for concrete construction activities should be included in the SPCC plan.*

- MM 28. Pressure-washing of concrete structures will be held to the minimum necessary to maintain structural integrity. Pressure-washing of concrete structures can result in an increased pH discharge with a potential to violate state water quality criteria.

*The intent of this MM is to minimize concrete entering natural water bodies and having adverse effects on fish when preparing previously placed concrete surfaces to obtain proper bond to new concrete.*

*In addition to the standard specifications, the engineer should include specific requirements to contain, collect, and dispose of concrete washwater in the construction plans and special provisions (also see MM 27).*

- MM 29. The contractor will protect all inlets and catchments from fresh concrete, tackifier, paving, and paint stripping in case inclement weather unexpectedly occurs.

*The intent of this MM is to prevent contaminated construction materials from entering inlets and catchments and being conveyed to natural water bodies or other sensitive areas.*

*The standard specifications cover this in general. However, it should be required on the TESC or SPCC plans.*

- MM 30. All exposed soils will be stabilized during the first available period and will not be allowed to sit idle for more than 7 days without receiving the erosion control treatment specified in the TESC plan. In the Puget Sound region, no soils will remain unstabilized for more than 2 days from October 1 to April 30 and for no more than 7 days from May 1 to September 30. Revegetation of construction easements and other areas will occur after the project is completed. All disturbed riparian vegetation will be replanted. Trees will be planted where consistent with highway safety standards. Riparian vegetation will be replanted with species native to that geographic region.

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20. Section 1-07.5(3) – *State Department of Ecology: The contractor shall dispose of all toxicants, including creosote, oil, cement, concrete, and equipment washwater, in ways that will prevent their entry into state waters.*

*The intent of this MM is to minimize erosion of exposed soils and transport of sediment-laden water to sensitive areas.*

*The standard specifications cover this requirement with regard to the length of time allowed for exposed soils before stabilization is required.<sup>21</sup> See MM 5 for information regarding replanting with native species.*

- MM 31. For all projects located within a listed fish evolutionarily significant unit (ESU) or DPS that involve 0.4 hectares or more (1 acre or more) of clearing, grading, or grubbing, a stormwater site plan will be developed and implemented. The stormwater site plan will include a spill prevention, control, and containment (SCC) plan, a temporary erosion and sedimentation control (TESC) plan, a hydraulic report, a BMP selection form, a water quality discipline report, and a BMP maintenance schedule.

*The intent of this MM is to take extra precautions on large projects to prevent sediment-laden water and contaminants from entering natural water bodies and sensitive areas.*

*The standard specifications include measures for preparation of an SPCC plan (see MM 24) and TESC plan (see MMs 26 and 30). The standard specifications do not address a stormwater site plan, which should be developed by the engineer during the design phase and incorporated into the construction plans and special provisions.*

- MM 32. Projects will be designed in accordance with the WSDOT *Highway Runoff Manual* (HRM), or the local agency stormwater manual (if required by the local agency having jurisdiction) provided it is more stringent than the *Highway Runoff Manual*.

*The intent of this MM is to ensure that stormwater-related impacts on natural water bodies and other sensitive areas are avoided and minimized by following WSDOT stormwater measures.*

*This MM is not addressed in the standard specifications and should be addressed during the design phase of the project, with necessary measures incorporated into the plans and special provisions.*

- MM 33. When practicable, all fueling and maintenance of equipment will occur more than 91 meters (300 feet) from the nearest wetland, ditch, or flowing or standing water. (Fueling large cranes, pile drivers, and drill rigs over 300 feet away may not be practicable.)

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21. Section 8-01.3(1) of the standard specifications – *General – Erosion Control and Water Pollution Control: In western Washington, erodible soil not being worked, whether at final grade or not, shall be covered within the following time period, using an approved soil covering practice, unless authorized otherwise by the engineer: from October 1 through April 30, 2 days maximum; and from May 1 to September 30, 7 days maximum.*

*The intent of this MM is to prevent fuel and maintenance equipment spills from entering sensitive areas.*

*This MM is not specifically addressed in the standard specifications and should be incorporated into the SPCC plan, construction plans, and special provisions.*

- MM 34. Construction equipment will not enter any water body without authorization from WDFW, NOAA, or USFWS, as appropriate. Equipment will be operated as far from the water's edge as possible.

*The intent of this MM is to minimize impacts (e.g., sedimentation) in natural water bodies by doing as much work as possible from beyond the water's edge.*

*See comments under MMs 13 and 14.*

- MM 35. Temporary material holding piles will not be placed in the 100-year floodplain during the rainy season (October through May) unless the following conditions are met: 1) storage does not occur when flooding is imminent, and 2) storage piles consisting of erosive material are covered with plastic tarps (or similar) and surrounded with straw bales. (Material used within 12 hours of deposition is not considered a temporary material storage pile.)

*The intent of this MM is to prevent temporary material stock piles from being flooded by streams or rivers and washed into natural water bodies.*

*The standard specifications do not specify the locations where material stockpiles can be placed.*

*If possible, the designer should identify the 100-year floodplain in relation to the project site.*

*If the required quantity of plastic covering is significant, the special provisions should include it as a bid item.*

- MM 36. BMPs will be used for all projects within 61 meters (200 feet) of surface water or wetland habitat as identified by the project biologist, to ensure that no foreign material (such as pavement slurry from asphalt grinding equipment) is sidecast, and to control and prevent sediments from entering aquatic systems.

*The intent of this MM (similar to MMs 25 and 33) is to prevent construction waste materials from entering sensitive areas.*

*BMPs chosen by the engineer during the design phase should be incorporated into the TESC plan and special provisions, in accordance*

*with Section 8-01.3(1)A of the standard specifications. Additionally, all sensitive areas to be protected must be clearly identified on the contract drawings.*

- MM 37. BMPs will be implemented to ensure that no foreign material such as oil or fuel from construction equipment enters marine waters and that sedimentation is minimized.

*The intent of this MM is to prevent spills from construction equipment or sediments from entering marine waters.*

*While prevention of water pollution is a requirement in the standard specifications, this MM is not specifically addressed. BMPs chosen by the designer during the design phase should be incorporated into the SPCC plan, TESC plan, and special provisions, in accordance with Section 1-07.15(1) of the standard specifications.*

- MM 38. All project-caused unstable slopes with a high likelihood of delivery to listed fish-bearing waters will be stabilized as soon as practicable.

*The intent of this MM is to prevent the risk of unstable slopes sliding into natural water bodies.*

*This MM is not addressed in the standard specifications in the general manner stated above. This MM should be incorporated into the TESC plan and special provisions, in accordance with Section 8-01.3(1)A of the standard specifications. For the specifications to be useful, the designer should pay special attention to the definition of “project-caused unstable slopes.”*

- MM 39. Large woody debris associated with project activities will be left in the riparian area if possible, or retained for future restoration use by WSDOT, or donated to a local watershed group if a need exists.

*The intent of this MM is to take advantage of the habitat value of large woody debris by using it to restore riparian areas at the project site or in other restoration projects.*

*The standard specifications present general requirements for disposal of debris and materials generated during clearing and grubbing activities but do not require special handling or use of large woody debris. Designers should incorporate appropriate requirements into the special provisions to support this MM.*

- MM 40. No paving, chip sealing, or stripe painting will be initiated in rainy weather.

*The intent of this MM is to prevent paving and painting materials from running off the construction site in stormwater and entering sensitive areas.*

*The standard specifications provide criteria to determine whether site conditions are adequate to ensure quality installation of paving and striping.<sup>22</sup> However, depending on the sensitive nature of the site, the designer may wish to include stronger weather protection requirements in the special provisions for paving and striping projects.*

### Bridge Activities

- MM 41. New stream crossing structures will not reduce the existing stream width.

*The intent of this MM is to avoid loss of existing habitat area within streams where crossings are proposed.*

*This MM is not addressed in the standard specifications. Maintaining existing stream width should be addressed during the design phase and shown in the construction plans.*

- MM 42. Bridge construction will be conducted from the banks or temporary work bridges. Equipment will be kept out of rivers and streams as much as possible.

*The intent of this MM is similar to MM 34.*

- MM 43. Bridge piers and abutments will be built outside the ordinary high water mark (OHWM).

*The intent of this MM is to minimize artificial structures within fish habitat.*

*This MM is not addressed in the standard specifications. The engineer should address this MM during the design phase and designate the locations of bridge piers and abutments on the construction plans.*

- MM 44. No treated wood debris will be allowed to fall into the water. Any debris that falls in will be removed immediately.

*The intent of this MM is to prevent treated wood debris from entering natural water bodies and contaminating them.*

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22. Section 5-04.3(16) of the standard specifications – *Weather Limitations – Hot Mix Asphalt (HMA): Hot mix asphalt shall not be placed on any wet surface.*

Section 5-02.3(10) – *Unfavorable Weather – Bituminous Surface Treatment: Asphalt shall not be applied to wet material.*

*This MM is not specifically addressed in the standard specifications. Handling of treated wood should be incorporated into the special provisions. Depending on the site, it may be prudent to require drip tarps that contain and prevent the release of construction-generated debris to waters of the state.*

- MM 45. All treated wood will be disposed of at a disposal facility approved for treated wood.

*The standard specifications require that debris and construction wastes be disposed of in accordance with all local, state, and federal laws. The designer should consider including a note or special provision to reference the standards.*

- MM 46. During bridge removal projects, as much of the existing structure as possible will be removed before finally dismantling the structure, to limit the amount of material and debris entering receiving waters. This includes all roadbed material, decking, concrete curbs, etc.

*The intent of this MM is to prevent treated wood debris from entering natural water bodies and contaminating them.*

*This is not addressed in the standard specifications and should be incorporated into the special provisions and contract drawings by the designer (also see MM 44).*

- MM 47. Concentrated accumulations of bird feces, road grit, and sand will be removed from bridges by mechanical sweeping or by hand insofar as practicable before dismantling.

*The intent of this MM is to prevent debris from entering and contaminating natural water bodies.*

*This MM is not specifically addressed in the standard specifications. Removal, containment, and handling of these items should be incorporated into the special provisions.*

- MM 48. All bridge removal projects will comply with water quality standards identified in the WSDOT—Washington State Department of Ecology Water Quality Implementing Agreement or approved temporary water quality modification permit in order to control turbidity levels within approved standards and prevent degradation of water quality.

*The intent of this MM is to avoid water quality violations in natural water bodies.*

*This MM is generally addressed in the standard specifications by the requirement to comply with all local, state, and federal regulations and*

*any permit requirements. However, the designer should address this MM during the design phase and incorporate appropriate BMPs into the construction plans and special provisions.*

- MM 49. Debris accumulations on the bridge, road surface, and within bridge drains will be collected or swept up and properly disposed of prior to flushing with fresh water. Flushing will involve the use of clean water only, to prevent detergents or other cleaning agents from entering waters of the state.

*The intent of this MM is to prevent debris on bridges from entering and contaminating natural water bodies.*

*The standard specifications provide general requirements for control and containment of debris, along with specific measures to be implemented if debris is generated during preparation for painting.<sup>23</sup>*

- MM 50. Structural cleaning: Bridge structures will be pressure-washed using appropriate filter fabric to control and contain paint particles generated by the activity. Concentrated accumulations of bird feces and nests will not be allowed to drop into the water. This material will be scraped from the bridge structure and collected and disposed of at an appropriate upland location.

*The intent of this MM is similar to MM 44.*

*The standard specifications generally provide for requirements in keeping with this MM.<sup>24</sup> The designer may find it useful, however, to augment the specification language and include it in the special provisions as well.*

- MM 51. Abrasive blasting containment: During abrasive blasting on a steel bridge prior to painting, a containment system appropriate for the type and location of the bridge will be in place and maintained to prevent spent blast media from reaching state waters. Spent blast media will be collected, sampled, classified for its hazardous material content, and disposed of as appropriate for its waste designation.

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23. Section 6-07.3(2)A of the standard specifications – *Bridge Cleaning: Following fungicide treatment and removal of bird guano, all steel surfaces to be painted shall be cleaned by either pressure flushing or sweep blasting. When pressure flushing is used, it shall be done with clean, fresh water only. No detergents, bleach, or other cleaning agents shall be employed.*

24. Section 6-07.3(2)A – *Bridge Cleaning: All washwater and debris from pressure flushing shall be filtered through a filter fabric capable of collecting all loose debris and particles.*

*Section 6-07.3(2)A – Bridge Cleaning: Bird guano shall be completely removed prior to any other cleaning. The bird guano shall be collected in a containment system approved by the engineer and shall not enter any waterway or the surrounding environment. All bird guano shall be removed and disposed of at a land disposal site approved by the engineer.*

*The intent of this MM is similar to MM 49.*

*The standard specifications generally provide for requirements in keeping with this MM.<sup>25</sup> The designer may find it useful, however, to augment the specification language and include it in the special provisions as well.*

### *Painting Activities*

- MM 52. Painters shall work from pails containing a maximum of 2 gallons of paint to minimize the impact of accidental spillage, except for sealed containers that are part of a spray system.

*The intent of this MM is to minimize the amount of accidental paint spills potentially entering natural water bodies and other sensitive areas.*

*This MM is covered by the standard specifications for painting steel surfaces.<sup>26</sup> The designer should confirm that the requirements apply to the site and should augment the special provisions as necessary.*

- MM 53. Paint materials and maintenance equipment will not be cleaned in waters of the state, nor will resultant cleaning runoff be allowed to enter state waters.

*The intent of this MM is to prevent paint materials from entering natural water bodies or other sensitive areas.*

*This MM is covered by the standard specifications for painting steel surfaces.<sup>27</sup> The designer should confirm that the requirements apply to the site and should augment the special provisions as necessary.*

- MM 54. Drip pans or other protective devices will be required for all paint mixing and solvent transfer operations.

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25. Section 6.07.3(2)B – *Containment of Abrasive Blasting: At the preconstruction conference, the contractor shall submit a written containment system plan, including drawings and describing the methods for waste containment, collection, and disposal, to the engineer for approval. If the containment structure is removed after the abrasive blasting operation and before the coating operation, the contractor shall install a drip tarp to prevent spillage of paint on the waterway and ground surface below.*

Section 6-07.3(2)C of the standard specifications – *Testing and Disposal of Containment Waste: The contractor shall have spent blast media collected, sampled, designated for its hazardous material content, and disposed of as appropriate for its waste designation.*

26. Section 6-07.3(2)G – *Painting Steel Surfaces: Painters using brushes shall work from pails containing a maximum of 2 gallons of paint in order to minimize the impact of any spill.*

27. Section 6-07.3(2)G – *Painting Steel Surfaces: Cleaning of equipment shall not be done in state waters, nor shall resultant cleaning runoff be allowed to enter state waters.*

*The intent of this MM is similar to MM 53.*

*The standard specifications provide for containment beneath painting activities, but the designer should add language in the special provisions specifying requirements for paint mixing and solvent transfer operations to be conducted in designated areas that are fully protected by spill containment controls.*

- MM 55. Drip tarps will be suspended below paint platforms to prevent spilled paint, buckets, and brushes from entering state waters.

### *Subsurface Sampling Activities*

- MM 56. During subsurface sampling, when working off a highway, bridge deck, barge, or road surface within 100 feet of waters containing listed fish species, a silt fence will be installed between the drilling site and the water body to contain sediments.

*The intent of this MM is to prevent sediment-laden water created by subsurface sampling from reaching natural water bodies.*

*This MM is not addressed in the standard specifications. Subsurface sampling is typically a preconstruction activity. This MM should be communicated to the geotechnical engineer.*

- MM 57. During subsurface sampling within 100 feet of waters containing listed fish species, where practical, all materials removed from the test hole will be removed from the site.

*The intent of this MM is to prevent foreign material from entering natural water bodies.*

- MM 58. During subsurface sampling within 100 feet of waters containing listed fish species, oil-absorbent pads will be placed under the drill rig to catch and control spills.

*The intent of this MM is to prevent drill rig oil spills from entering natural water bodies.*

- MM 59. For subsurface sampling within 100 feet of waters containing listed fish species, the team lead will have a minimum of 4 hours training on erosion control, spill control, and containment.

*The intent of this MM is to prevent spills and sediments from entering natural water bodies.*

- MM 60. For subsurface sampling within 100 feet of waters containing listed fish species, all existing large woody debris will be left onsite.

*The intent of this MM is to prevent loss of habitat by keeping large woody debris onsite.*

#### *Stream Bank Activities*

- MM 61. When feasible, on stream bank protection and slide repair projects, fish habitat improvement measures will be evaluated and implemented by incorporating available large woody debris (LWD) and boulders in the bank protection or repair design.

*The intent of this MM is to take advantage of existing large woody debris and boulders that can be incorporated into the design.*

*This MM is not addressed in the standard specifications. The special provisions should specify that existing large woody debris and boulder material may be used if approved for use by the engineer.*

- MM 62. Projects that include bank stabilization will follow the *Integrated Stream Bank Protection Guidelines* insofar as practicable.

*The intent of this MM is to ensure that bank stabilization projects are appropriately designed and will achieve their objectives.*

*This MM is not addressed in the standard specifications. The engineer should design bank stabilization projects in accordance with appropriate guidelines and incorporate necessary measures into the construction plans and special provisions.*

#### *Temporary Access Roads*

- MM 63. The development and use of temporary access roads will meet the following conditions:

- a) Existing roadways or travel paths will be used whenever reasonable.
- b) Where stream crossing are essential, the crossing design will accommodate reasonably foreseeable risks (such as flooding and associated bedload and debris) to prevent diversion of streamflow out of the channel and down the road in the event of a crossing failure.
- c) Vehicles and machinery must cross riparian areas and streams perpendicular to the main channel whenever reasonable.

- d) Preparation of temporary roads within 150 feet of streams will avoid or minimize soil disturbance and compaction by clearing vegetation to ground level, then either placing clean gravel over geotextile fabric, or using hog fuel (i.e., hog chips) as the temporary road surface. All affected areas will be scarified and replanted, as appropriate, following removal of the temporary road.
- e) The number of stream crossings will be minimized.

*The intent of this MM is to minimize impacts associated with access roads through sensitive areas, including streams and riparian areas.*

*This MM is not addressed in the standard specifications. The engineer should consider this MM during the design phase and designate the location of access roads on construction plans. Information pertaining to proper materials and methods of building the access roads should be stated in the special provisions.*

#### **6.4.2.2 Examples of MMs and BMPs: Sensitive Terrestrial Habitat**

Examples of MMs and BMPs identified for projects located near sensitive prairie habitat, sand dunes, salt-spray meadows, open-field habitat, nesting sites, or marbled murrelet habitat include but are not limited to the following:

- MM 64. A temporary erosion and sedimentation control (TESC) plan and a source control plan will be developed and implemented for all projects requiring clearing, vegetation removal, grading, ditching, filling, embankment compaction, or excavation. The BMPs in these plans will be used to control sediments from all vegetation-disturbing and ground-disturbing activities.
- MM 65. No contractor staging areas will be allowed within 61 meters (200 feet) of potential prairie habitat, as identified by the project biologist, unless site-specific review completed by the project biologist indicates that no impacts to the sensitive resource areas will occur due to topography or other factors.
- MM 66. BMPs will be implemented for all projects within 61 meters (200 feet) of prairie habitat to minimize sediment impacts and to ensure that no foreign material (such as pavement slurry from grinding equipment) is sidecast or stored in prairie habitat.
- MM 67. BMPs will be implemented for all projects within 61 meters (200 feet) of sand dunes, salt-spray meadows, or open-field habitat (including suitable Oregon silverspot butterfly habitat) to minimize sediment impacts and to ensure that no foreign material (such as pavement slurry from grinding

equipment) will be sidecast or stored on dunes or meadows. The distance from sand dunes, salt-spray meadows, or open-field habitat where BMPs will be necessary may be modified by the project biologist after a site-specific review is conducted to ensure that no impact will occur.

- MM 68. All trash, food waste, and other items attractive to crows, jays, and other Corvidae will be picked up and removed from the project area on a daily basis for projects within 1.6 kilometers (1 mile) of suitable or critical marbled murrelet nesting habitat.

*The intent of this MM is to prevent potential predation of murrelet nestlings by corvids.*

*This MM is not addressed in the standard specifications and should be incorporated into the special provisions.*

- MM 69. Construction of new facilities such as rest area maintenance facilities within 5 miles of suitable or critical marbled murrelet nesting habitat will implement a trash handling plan to ensure that food wastes and other items attractive to crows, jays, and other Corvidae will be removed and unavailable to wildlife.

*The intent of this MM is to prevent potential predation of murrelet nestlings by corvids.*

*This MM is not addressed in the standard specifications but should be implemented after construction.*

- MM 70. Trees that are removed in suitable spotted owl or murrelet habitat are to be dropped into the road right-of-way or in other areas that will be cleared. Where large woody debris is lacking in adjacent forests, felled trees are to be placed in the forest, where practicable and agreeable to the adjacent property owner, following coordination with and approval by USFWS.

*When it is absolutely necessary to remove trees in suitable spotted owl or murrelet habitat, the intent of this MM is to reintroduce the trees as large woody debris (LWD) habitat on the forest floor. This way, the trees can be put to a good use and provide habitat for small mammals and other wildlife. In addition, the felled trees can function as nurse logs for other vegetation such as red huckleberry and western hemlock trees.*

*This MM is not addressed in the standard specifications. The designer should specify the locations for placement of large woody debris on the construction plans or provide measures in the special provisions for a biologist to approve locations during construction.*

MM 71. Projects involving bridge replacement within the range of the grizzly bear will design the new structure to accommodate wildlife crossings, when practicable.

*The intent of this MM is incorporate measures that support the recovery of grizzly bears.*

*This MM is not addressed in the standard specifications and should be incorporated into the construction plans and special provisions.*

MM 72. No contractor staging areas will be allowed within 200 feet of northern wormwood habitat as identified by the project biologist.