

DEAD WOOD, SLASH DISPOSAL, AND CARBON STORAGE (v.2)

As of November 2011, the following forest practices rules and Board Manuals apply to dead wood and slash disposal. There are no forest practices rules specific to carbon storage however, all rules that require leaving trees or down wood after harvest provide carbon storage.

Unless otherwise noted, only the pertinent portion of the rules and Board Manuals are listed for easier readability. For the reader's convenience, all of the WAC chapters and Board Manuals are hyperlinked so they can be seen in their entirety if desired.

Chapter 222-16 WAC, Definitions

WAC 222-16-010 General definitions.

"Completion of harvest" means the latest of:

Completion of removal of timber from the portion of forest lands harvested in the smallest logical unit that will not be disturbed by continual logging or an approved slash disposal plan for adjacent areas; or

Scheduled completion of any slash disposal operations where the department and the applicant agree within 6 months of completion of yarding that slash disposal is necessary or desirable to facilitate reforestation and agree to a time schedule for such slash disposal; or

Scheduled completion of any site preparation or rehabilitation of adjoining lands approved at the time of approval of the application or receipt of a notification: Provided, That delay of reforestation under this paragraph is permitted only to the extent reforestation would prevent or unreasonably hinder such site preparation or rehabilitation of adjoining lands.

"Forest practice" means any activity conducted on or pertaining to forest land and related to growing, harvesting, or processing timber or forest biomass, including but not limited to:

- Road and trail construction;
- Harvesting, final and intermediate;
- Precommercial thinning;
- Reforestation;
- Fertilization;
- Prevention and suppression of diseases and insects;
- Salvage of trees; and
- Brush control.

Forest practice" shall not include: Forest species seed orchard operations and intensive forest nursery operations; or preparatory work such as tree marking, surveying and road flagging; or removal or harvest of incidental vegetation from forest lands such as berries, ferns, greenery, mistletoe, herbs, mushrooms, and other products which cannot normally be expected to result in damage to forest soils, timber or public resources.

"Green recruitment trees" means those trees left after harvest for the purpose of becoming future wildlife reserve trees under WAC [222-30-020\(11\)](#).

"Salvage" means the removal of snags, down logs, windthrow, or dead and dying material.

"Site preparation" means those activities associated with the removal of slash in preparing a site for planting and shall include scarification and/or slash burning.

"Slash" means pieces of woody material containing more than 3 cubic feet resulting from forest practices activities.

"Wildlife reserve trees" means those defective, dead, damaged, or dying trees which provide or have the potential to provide habitat for those wildlife species dependent on standing trees.

Wildlife reserve trees are categorized as follows:

Type 1 wildlife reserve trees are defective or deformed live trees that have observably sound tops, limbs, trunks, and roots. They may have part of the top broken out or have evidence of other severe defects that include: "Cat face," animal chewing, old logging wounds, weather injury, insect attack, or lightning strike. Unless approved by the landowner, only green trees with visible cavities, nests, or obvious severe defects capable of supporting cavity dependent species shall be considered as Type 1 wildlife reserve trees. These trees must be stable and pose the least hazard for workers.

Type 2 wildlife reserve trees are dead Type 1 trees with sound tops, limbs, trunks, and roots.

Type 3 wildlife reserve trees are live or dead trees with unstable tops or upper portions. Unless approved by the landowner, only green trees with visible cavities, nests, or obvious severe defects capable of supporting cavity dependent species shall be considered as Type 3 wildlife reserve trees. Although the roots and main portion of the trunk are sound, these reserve trees pose high hazard because of the defect in live or dead wood higher up in the tree.

Type 4 wildlife reserve trees are live or dead trees with unstable trunks or roots, with or without bark. This includes "soft snags" as well as live trees with unstable roots caused by root rot or fire. These trees are unstable and pose a high hazard to workers.

WAC 222-16-050, Classes of forest practices.

(1) **Class IV-special.** Except as provided in WAC [222-16-051](#), application to conduct forest practices involving the following circumstances requires an environmental checklist in compliance with the State Environmental Policy Act (SEPA), and SEPA guidelines, as they have been determined to have potential for a substantial impact on the environment. It may be determined that additional information or a detailed environmental statement is required before these forest practices may be conducted.

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(c) Harvesting, road construction, aerial application of pesticides and site preparation on all lands within the boundaries of any national park, state park, or any park of a local governmental entity, except harvest of less than five MBF within any developed park recreation area and park managed salvage of merchantable forest products.

...

(3) **"Class I."** Those operations that have been determined to have no direct potential for damaging a public resource are Class I forest practices. When the conditions listed in "Class IV - Special" are not present, these operations may be commenced without notification or application.

...

k) Cutting and/or removal of less than five thousand board feet of timber (including live, dead and down material) for personal use (i.e., firewood, fence posts, etc.) in any twelve-month period, if not within the CRGNSA special management area.

...

m) Slash burning pursuant to a burning permit (RCW [76.04.205](#)).

n) Other slash control and site preparation not involving either off-road use of tractors on slopes exceeding forty percent or off-road use of tractors within the shorelines of a Type S Water, the riparian management zone of any Type F Water, or the bankfull width of a Type Np Water, a wetland management zone, a wetland, or the CRGNSA special management area.

...

(4) "**Class II.**" Certain forest practices have been determined to have a less than ordinary potential to damage a public resource and may be conducted as Class II forest practices: Provided, That no forest practice enumerated below may be conducted as a Class II forest practice if the operation requires a hydraulic project approval (RCW [77.55.100](#)) or is within a "shorelines of the state," or involves owner of perpetual timber rights subject to RCW [76.09.067](#) (other than renewals). Such forest practices require an application. No forest practice enumerated below may be conducted as a "Class II" forest practice if it takes place on lands platted after January 1, 1960, as provided in chapter [58.17](#) RCW, or on lands that have been or are being converted to another use. No forest practice enumerated below involving timber harvest or road construction may be conducted as a "Class II" if it takes place within urban growth areas designated pursuant to chapter [37.70A](#) RCW. Such forest practices require a Class IV application. Class II forest practices are the following:

...

d) Salvage of logging residue if none of the operation or limits of construction takes place within the riparian management zone of a Type F Water, within the bankfull width of a Type Np Water, within a wetland management zone or within a wetland; and if none of the operations involve off-road use of tractor or wheeled skidding systems on a sideslope of greater than forty percent.

e) Any of the following if none of the operation or limits of construction takes place within the riparian management zone of a Type F Water, within the bankfull width of a Type Np Water, within a wetland management zone, within a wetland, or within the CRGNSA special management area, and if none of the operations involve off-road use of tractor or wheeled skidding systems on a sideslope of greater than forty percent, and if none of the operations are located on lands with a likelihood of future conversion (see WAC [222-16-060](#)):

...

iii) Salvage of dead, down, or dying timber if less than forty percent of the total timber volume is removed in any twelve-month period.

...

(5) "**Class III.**" Forest practices not listed under Classes IV, I or II above are "Class III" forest practices. Among Class III forest practices are the following:

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e) Harvest or salvage of timber except where classed as Class I, II or IV forest practices.

...

j) Site preparation or slash abatement not listed in Classes I or IV forest practices.

...

Chapter 222-24 WAC, Road Construction and Maintenance

WAC 222-24-030 Road construction.

...

***(2) In permanent road construction, do not bury:**

(a) Loose stumps, logs or chunks if they will contribute more than 5 cubic feet in the load-bearing portion of the road.

(b) Any significant amount of organic debris within the top 2 feet of the load-bearing portion of the road.

(c) Excessive accumulation of debris or slash in any part of the load-bearing portion of the road fill.

...

***(5) Channel clearance.** Within 50 feet upstream from a culvert inlet clear stream channel of all debris and slash generated by the operations that reasonably may be expected to plug the culvert prior to the removal of equipment from the vicinity, or the winter season, whichever is first. (See the board manual, section 4 for debris removal guidelines.)

...

***(9) Waste disposal.** When spoil, waste and/or other debris is generated during construction, this material shall be deposited or wasted in suitable areas or locations and be governed by the following:

(a) Spoil or other debris shall be deposited above the 100-year flood level of any typed waters or in other suitable locations to prevent damage to public resources. The material shall be stabilized using the recommended schedule and procedures found in the board manual, section 3.

...

WAC 222-24-035 Landing location and construction.

(2) Landing construction.

...

b) Where the slopes exceed 60 percent, fill material must be free from loose stumps and excessive accumulations of slash and be mechanically compacted where necessary and practical in layers by tractor to prevent soil erosion and mass soil movement. Chemical compacting agents may be used in accordance with WAC 222-38-020.

...

WAC 222-24-040 Water crossing structures.

***(1) General provisions for all typed waters** In addition to the applicable general provisions below, installation, maintenance and removal of water crossing structures in or across the bankfull width of Type S or F Waters are subject to hydraulic code rules, chapter [220-110 WAC](#), and require hydraulic project approval (HPA) issued by the department of fish and wildlife. HPAs may be required on Type Ns and Np Waters.

...

(f) Wood removed from the upstream end of culverts and bridges will be placed at the downstream end of such culverts and bridges in such a way as to minimize obstruction of fish passage and to the extent practical while avoiding significant disturbance of sediment, in connection with maintenance activities.

...

***(3) Culvert installation for Type Np and Ns Waters.** In addition to applicable general provisions above, installation, maintenance and removal of permanent culverts in or across Type Np and Ns Waters are subject to the following provisions:

...
(i) Stream beds shall be cleared for a distance of 50 feet upstream from the culvert inlet of such slash or debris that reasonably may be expected to plug the culvert.

WAC 222-24-052 Road maintenance.

***(1) Forest roads.** Forest roads are defined in WAC [222-16-010](#). To the extent necessary to prevent potential or actual damage to public resources, the following maintenance shall be conducted on forest roads, except as addressed in subsections *(5) and *(6) of this section:

...
(h) During the regular course of road maintenance on stream-adjacent parallel roads, down wood that is blocking vehicle passage shall be placed on the side of the road closest to the adjacent water.

Chapter 222-30 WAC, Timber Harvesting

WAC 222-30-010 Policy – Timber harvesting.

***(1)** This chapter covers all removal of timber from forest lands in commercial operations, commercial thinning, salvage of timber, relogging merchantable material left after prior harvests, postharvest cleanup, and clearing of merchantable timber from lands being converted to other uses. It does not cover removal of incidental vegetation or removal of firewood for personal use. To the extent practicable, the department shall coordinate activities using a multiple disciplinary planning approach.

WAC 222-30-020 *Harvest unit planning and design.

...
(11) Wildlife reserve tree management. In areas where leaving wildlife reserve trees under this section will not create a significant fire hazard, or significant hazard to overhead power lines and operations that are proposed in the vicinity of wildlife reserve trees will not create a significant safety or residential hazard nor conflict with achieving conformance with the limitation of or performance with the provisions of chapter [76.04](#) RCW (snag falling law) and chapter [49.17](#) RCW (safety), wildlife reserve trees will be left to protect habitat for cavity nesting wildlife in accordance with the following:

(a) For the purposes of this subsection the following defines eastern and western Washington boundaries for wildlife reserve tree management. Beginning at the International Border and Okanogan National Forest boundary at the N1/4 corner Section 6, T. 40N, R. 24E., W.M., south and west along the Pasayten Wilderness boundary to the west line of Section 30, T. 37N, R. 19E.,
Thence south on range line between R. 18E. and R. 19E., to the Lake Chelan-Sawtooth Wilderness at Section 31, T. 35N, R. 19E.,
Thence south and east along the eastern wilderness boundary of Lake Chelan-Sawtooth Wilderness to the west line of Section 18, T. 31N, R. 19E. on the north shore of Lake Chelan,
Thence south on the range line between R. 18E. and R. 19E. to the SE corner of T. 28N, R. 18E.,
Thence west on the township line between T. 27N, and T. 28N to the NW corner of T. 27N, R.

17E.,
Thence south on range line between R. 16E. and R. 17E. to the Alpine Lakes Wilderness at Section 31, T. 26N, R. 17E.,
Thence south along the eastern wilderness boundary to the west line of Section 6, T. 22N, R. 17E.,
Thence south on range line between R. 16E. and R. 17E. to the SE corner of T. 22N, R. 16E.,
Thence west along township line between T. 21N, and T. 22N to the NW corner of T. 21N, R. 15E.,
Thence south along range line between R. 14E. and R. 15E. to the SW corner of T. 20N, R. 15E.,
Thence east along township line between T. 19N, and T. 20N to the SW corner of T. 20N, R. 16E.,
Thence south along range line between R. 15E. and R. 16E. to the SW corner of T. 18N, R. 16E.,
Thence west along township line between T. 17N, and T. 18N to the SE corner of T. 18N, R. 14E.,
Thence south along range line between T. 14E. and R. 15E. to the SW corner of T. 14N, R. 15E.,
Thence south and west along Wenatchee National Forest boundary to the NW corner of T. 12N, R. 14E.,
Thence south along range line between R. 13E. and R. 14E. to the SE corner of T. 10N, R. 13E.,
Thence west along township line between T. 9N, and T. 10N to the NW corner of T. 9N, R. 12E.,
Thence south along range line between R. 11E. and R. 12E. to the SE corner of T. 8N, R. 11E.,
Thence west along township line between T. 7N, and T. 8N to the Gifford Pinchot National Forest boundary,
Thence south along forest boundary to the SE corner of Section 33, T. 7N, R. 11E.,
Thence west along township line between T. 6N, and T. 7N to the SE corner of T. 7N, R. 9E.,
Thence south along Skamania-Klickitat County line to Oregon-Washington.

(b) In Western Washington, for each acre harvested 3 wildlife reserve trees, 2 green recruitment trees, and 2 down logs shall be left. In Eastern Washington for each acre harvested 2 wildlife reserve trees, 2 green recruitment trees, and 2 down logs shall be left. Type 1 wildlife reserve trees may be counted, at the landowner's option, either as a wildlife reserve tree or as a green recruitment tree. If adequate wildlife reserve trees are not available, no additional green recruitment trees will be required as substitutes. Landowners shall not under any circumstances be required to leave more than 2 green recruitment trees per acre for the purpose of wildlife reserve tree recruitment, or be required to leave Type 3 or 4 wildlife reserve trees.

(c) In Western Washington, only those wildlife reserve trees 10 or more feet in height and 12 or more inches dbh shall be counted toward wildlife reserve tree retention requirements. In Eastern Washington, only those wildlife reserve trees 10 or more feet in height and 10 or more inches dbh shall be counted toward wildlife reserve tree retention requirements. Green recruitment trees, 10 or more inches dbh and 30 or more feet in height and with at least 1/3 of their height in live crown, left standing after harvest may be counted toward green recruitment tree requirements. Green recruitment trees and/or wildlife reserve trees left to meet other requirements of the rules or those left voluntarily by the landowner shall be counted toward satisfying the requirements of this section. Large, live defective trees with broken tops, cavities, and other severe defects are preferred as green recruitment trees. Only down logs with a small end diameter greater than or equal to 12 inches and a length greater than or equal to 20 feet or equivalent volume shall be counted under (a) of this subsection. Large cull logs are preferred as

down logs.

(d) In the areas where wildlife reserve trees are left, the largest diameter wildlife reserve trees shall be retained to meet the specific needs of cavity nesters. Where the opportunity exists, larger trees with numerous cavities should be retained and count as recruitment trees.

(e) In order to facilitate safe and efficient harvesting operations, wildlife reserve trees and recruitment trees may be left in clumps. For purposes of distribution, no point within the harvest unit shall be more than 800 feet from a wildlife reserve tree or green recruitment tree retention area. Subject to this distribution requirement, the location of these retention areas and the selection of recruitment trees shall be at the landowner's discretion. Closer spacing of retention areas through voluntary action of the landowner is encouraged. Wildlife reserve tree and green recruitment tree retention areas may include, but are not limited to, riparian management zones, riparian leave tree areas, other regulatory leave areas, or voluntary leave areas that contain wildlife reserve trees and/or green recruitment trees.

(f) In order to provide for safety, landowners may remove any Type 3 or 4 wildlife reserve tree, which poses a threat to humans working, recreating, or residing within the hazard area of that tree. In order to provide for fire safety, the distribution of wildlife reserve tree retention areas, described in (e) of this subsection, may be modified as necessary based on a wildlife reserve tree management plan proposed by the landowner and approved by the department.

WAC 222-30-045 Salvage logging within riparian management zone.
(entire WAC provided)

Salvage logging within a riparian management zone is based upon the zone (core, inner or outer) in which the tree was originally located, applicable riparian stand requirements and the extent of previous harvest activities in the zone.

***(1) Salvage logging within the outer edge of bankfull width of any typed water.** No salvage may take place within the outer edge of bankfull width of any typed water.

(2) Salvage logging in a core zone or channel migration zone. No salvage may take place within the RMZ core zone or a channel migration zone, including any portion of those trees that may have fallen outside of these zones.

(3) Salvage logging in the inner zone. Salvage may not take place within the inner zone if the stand requirements cannot be met by the residual stand. If the proposed salvage involves down tree(s) that originated from the inner zone, salvage of down wood may only be permitted if the down wood was not needed to meet stand requirements in the inner zone. Salvage of any existing down wood may not take place if the unremoved balance of down wood is insufficient to meet the regional down wood guidelines in (a) and (b) of this subsection. Salvage within the inner zone must be conducted to protect residual undamaged trees within the inner zone. Down wood guidelines for salvage in RMZ inner zones are:

(a) In Western Washington:

Logs with a solid core	< 1 foot diameter	1-2 foot diameter	> 2 foot diameter	Total
Number of logs/acre	85	83	26	194

(b) **In Eastern Washington** ponderosa pine, mixed conifer, and high elevation habitat types:
Follow the down wood requirements for each habitat type in WAC [222-30-022](#).

(4) **Salvage logging in the outer zone.** Salvage may not take place within the outer zone if the riparian leave tree requirements cannot be met by the residual standing or down trees. If the proposed salvage involves tree(s) that are down that originated from the outer zone, salvage may only be permitted of down wood if the down wood was not needed to meet riparian leave tree requirements in the outer zone.

(5) Salvage logging in sensitive sites or Type Np riparian management zones. No salvage may take place within a sensitive site or a Type Np RMZ.

WAC 222-30-060 Cable yarding.

*(3) **Deadfalls.** Logs which are firmly embedded in the bed or bank of Type S or F Waters shall not be removed or disturbed without hydraulic project approval from the department of fish and wildlife.

...

WAC 222-30-070 Ground-based logging systems.

*(4) **Deadfalls.** Logs firmly embedded in the bed or bank of Type S or F Waters shall not be removed or disturbed without hydraulic project approval from the department of fish and wildlife.

...

*(8) **Skid trail maintenance.**

...

(b) Skid trails located within 200 feet horizontal distance of any typed water that directly delivers to the stream network shall use water bars, grade breaks, and/or slash to minimize sediment delivery to the stream. Water bars shall be placed at a frequency to minimize gully and soil erosion. In addition to water barring, skid trails with exposed soil that is erodible and may be reasonably expected to cause damage to a public resource shall be seeded with a noninvasive plant species (preferably a species native to the state) and adapted for rapid revegetation of disturbed soil, or treated with other erosion control measures acceptable to the department.

WAC 222-30-080 Landing cleanup.

Except as approved by the department, the following rules shall be met within 60 days after completion of hauling logs from any landing, or as soon thereafter as practical.

(3) **Cleanup.**

(a) Slash accumulations which would prevent reforestation of otherwise plantable fills, sidecast or cut slopes of landings shall be disposed of or be piled on the landing floor for future disposal.

(b) Slash shall not be buried in any filled portion of the landing in connection with landing cleanup operations.

...

WAC 222-30-090 Postharvest site preparation.

(entire WAC provided)

Unless the application or notification indicates that the landowner or forest landowner specifically agrees to assume responsibility for compliance with this section, the operator shall leave the site in a condition suitable for reforestation following any clear cutting, or any partial cutting west of the summit of the Cascades where 80 percent or more of the cubic volume is removed within any 5 consecutive years unless the department determines that the live trees remaining will reasonably utilize the timber growing capacity of the soils. Lands being converted to another use or classified as urban development lands under WAC [222-34-050](#) are exempt.

The following site preparation is required when necessary to establish a condition suitable for reforestation:

- (1) Cutting, slashing, or other treatment of all noncommercial tree species, other competing vegetation, and nonmerchantable size trees commonly known as "whips" which will not reasonably utilize the growing capacity of the soil except in wetland management zones, riparian management zones; or
- (2) Pile or windrow slash; or
- (3) Mechanically scatter slash; or
- (4) Leave the cutover area in a condition for controlled broadcast burning, and subsequently burn.

WAC 222-30-100 Slash disposal or prescribed burning.
(entire WAC provided)

- (1) **Slash disposal or prescribed burning are prohibited in the core zone.**
- (2) **Slash disposal techniques:**

*(a) Any conventional method of slash disposal may be used, except in Type A or B Wetlands, wetland management zones, and RMZ core and inner zones, Type Np RMZs, sensitive sites, and on sites where the department determines that a particular method would cause unreasonable risk to leave trees, public resources or site productivity. Conventional methods of slash disposal include the following: Controlled broadcast burning; pile or windrow and burn; pile or windrow without burning; mechanical scatter and compaction; scarification; chip, mulch or lop and scatter; burying; and physical removal from the forest lands: Provided, That on land shown to have low productivity potential the landowner or operator shall obtain the department's approval of its regeneration plan prior to utilizing controlled broadcast burning as a slash disposal technique. In riparian management inner zones, slash disposal shall be by hand, unless approved by the department. Slash disposal methods that employ machine piling, mechanical scatter and/or compaction, scarification or other techniques that result in soil disturbance shall not be allowed in equipment limitation zones. Scarification shall not be allowed within wetlands. Machine piling is not allowed in Type A and B Wetlands. Department approval, through a burning permit, is required for burning within an equipment limitation zone.

(b) All slash burning requires a burning permit from the department which provides for compliance with the smoke management plan and reasonable care to protect Type A and B Wetlands, wetland management zones, riparian management zones, equipment limitation zones, soil, residual timber, public resources, and other property.

- (3) **Slash isolation, reduction, or abatement** is required when the department determines there is an extreme fire hazard according to law (see chapter [332-24](#) WAC).
- (4) **Slash disposal** is required where the forest landowner has applied for and been granted an extension of time for reforestation on the grounds that slash disposal is necessary or desirable before reforestation.

***(5) Removing slash and debris from streams.**

"Slash" or "debris" which can reasonably be expected to cause significant damage to the public resource shall be removed from Type S, F or Np Waters, to above the 100-year flood level and left in a location or manner minimizing risk of re-entry into the stream, lake or pond and if substantial accumulations of slash exist below the 100-year flood level of Type S, F or Np Waters, slash disposal is required. See the forest practices board manual section 4 for "Guidelines for clearing slash and debris from Type Np and Ns Waters."

***(6) Fire trails.**

(a) Construct drainage structures as needed to control erosion.

(b) Reasonable care shall be taken to minimize excavation during fire trail construction and sidecast shall only be permitted above the 100-year flood level.

(c) Fire trails shall not be located within Type A or B Wetlands, wetland management zones, equipment limitation zones or riparian zones without prior written approval of the department. Hand constructed fire trails are preferred within forested wetlands. When machine built fire trails are necessary for control of burning, trail width and excavation shall be minimized.

(7) Disturbance avoidance for northern spotted owls. Burning within a SOSEA boundary shall not be allowed within 0.25 mile of a northern spotted owl site center between March 1 and August 31, provided that, this restriction shall not apply if:

(a) The landowner demonstrates that the owls are not actively nesting during the current nesting season; or

(b) The forest practice is operating in compliance with a plan or agreement developed for the protection of the northern spotted owl under WAC [222-16-080](#) (6)(a), (e), or (f).

(8) Disturbance avoidance for marbled murrelets. Slash disposal or prescribed burning shall not be allowed within 0.25 mile of an occupied marbled murrelet site during the critical nesting season, provided that, this restriction shall not apply if the forest practice is operating in compliance with a plan or agreement developed for the protection of the marbled murrelet under WAC [222-16-080](#) (6)(a) or (c).

Chapter 222-34 WAC, Reforestation

WAC 222-34-010 Required reforestation — West of Cascades Summit.

(1) Reforestation - where required.

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b) Reforestation is not required where:

i) Individual dead, dying, down or windthrown trees are salvaged; or

...

WAC 222-34-020 Required reforestation — East of Cascades Summit.

(1) Reforestation - where required.

...

b) Reforestation is not required where:

i) Individual dead, dying, down or windthrown trees are salvaged; or

...

BOARD MANUAL SECTION 3, GUIDELINES FOR FOREST ROADS

PART 4. ROAD CONSTRUCTION AND MAINTENANCE

4.1 General Construction BMP (Rules are in WAC 222-24-030.)

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- Place all clearing debris and slash (such as tree limbs, stumps and brush) outside the road prism.

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4.3 Erosion Control

Erosion control measures are necessary if exposed soils can deliver sediment to typed waters. The key to controlling sediment is to control erosion. The best way to control erosion is to prevent it by:

- Covering all exposed soils with non-invasive plant species as soon as possible (native plants are preferred). Until the area can be vegetated, apply straw, logging slash or *fiber mats* to the exposed soil to prevent erosion from raindrop splash. This not only protects and holds soil particles from the erosive effects of rainfall; it also prevents the spread of noxious weeds.

...

4.4 Sediment Control

The goal of sediment control is to create a stable, dispersed, non-erosive drainage pattern. This minimizes potential or actual sediment delivery to typed waters. Where needed, sediment control BMPs include:

- Excavating *dead sumps* to intercept and settle sediment-laden water.
- ...
- Installing *slash filter windrows* to intercept sediment at the toe of fills over water crossings.
- Placing *straw wattles*, *silt fencing*, or *slash filter windrows* perpendicular to the hill slope to slow down and disperse water flow.

Use *sediment traps*, *silt fences* or *dead sumps* only as temporary or remedial measures because they require continuous maintenance.

4.6 Grading

Avoid the following practices:

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- Burying vegetation, logging debris and slash into the road running surface or sub-grade. (Decomposition of this material will leave holes in the road surface. Traffic on this surface may cause sediment delivery to typed waters.)

4.7 Roadside Vegetation Maintenance

Mechanical Brushing BMPs

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- Upon completion, remove all debris and/or slash generated during mechanical brushing that will interfere with proper function of ditches or culverts.

PART 5. LANDINGS (Rules are in WAC 222-24-035.)

General landing BMPs

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- After completion of harvest:
 - Pull back fill material and woody debris on steep slopes that have the potential to damage a public resource. Place debris in a stable location.

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PART 6. WATER CROSSINGS (Rules are in WAC 222-24-040.)

6.1 General Water Crossing BMPs (Rules are in WAC 222-24-040.)

Water crossing construction BMPs

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- Place slash and/or debris above the 100-year flood level outside of the riparian management zone or wetland management zone in a stable location.

PART 7. DRAINAGE STRUCTURES

7.5 Ditches

Maintenance BMPs

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- Clean ditches of all debris generated during logging. Place this material on the downhill side of the road near the base of the fill.

BOARD MANUAL SECTION 4, GUIDELINES FOR CLEARING SLASH AND DEBRIS FROM NP AND NS WATER

(entire section 4 provided)

In cases such as those described in **WAC 222-24-030(5)**, channel clearance, slash and debris that may reasonably be expected to plug new culverts on Type Np or Ns Waters must be cleared from the channel for an upstream distance of 50 feet. Debris removed from the channel in these circumstances must be placed immediately downstream from the culvert, or as otherwise required in an HPA. Slash and debris that are excluded from these cases include logs that are embedded along their length or at least substantially at one end, and slash buried under stable deposits of soil, rocks or woody debris. Do not limb, buck, notch, or remove trees and logs that are to be left in the stream channel or are firmly embedded.

Large accumulations of slash may contribute to the initiation or exacerbation of mass wasting events (e.g., debris slides and debris torrents), however, these events are expected to be rare because current forest practice rules prohibit the machine piling of slash and debris within 30 feet of unbuffered stream banks. Likewise, limbing and bucking within the bankfull channel of Type S, F, Np waters, RMZ core zones, sensitive sites, or open water areas of Type A wetlands is prohibited (**WAC 222-30-050(2)**). In the event that slash or debris must be removed from the channel, an HPA, issued by WDFW, is required in Type S or F Waters. An HPA may be required on Type Np or Ns Waters.

The benefits of retaining slash are tied to soil, fish and wildlife, and other public resources. Small woody debris (<4 inches diameter) provides cover for a variety of riparian-dependent amphibians and small mammals. Green branches left over exposed soils may reduce erosion. Small woody debris in the water can provide important habitat for small fish (fry) and aquatic amphibians, and may trap leaf litter and other detritus. Debris left on flood plains trap leaf litter and other detritus, which subsequently decomposes and enriches the soil. Evidence also suggests that small accumulations of woody debris may moderate fine sediment transport to downstream reaches. Large woody debris (>4 inches diameter and >1.5 times bankfull width in length) may provide important structural components to stream channels, trapping beds of gravel that are used by fish for spawning, and as habitat for aquatic invertebrates. Floodwater flowing around large woody debris scours pools, which become habitat for more abundant and larger fish. While Type Np and Ns Waters are not fish bearing by definition, woody debris in these waters are important for helping to abate excessive erosion during peak flows and for providing recruitment of debris which if eventually moved down stream may become beneficial structures for fish habitat in Type F and S Waters.