Definition

The treatment of residual woody material that is created due to management activities or natural disturbances.

Purposes

- Reduce hazardous fuels
- Protect/maintain air quality by reducing the risk of wildfire
- Reduce the risk of harmful insects and disease
- To improve access for management purposes
- Improve access to forage for livestock and wildlife
- Develop renewable energy systems
• Enhance aesthetics
• Reduce the risk of harm to humans and livestock
• Improve the soil organic matter
• Improve the site for natural or artificial regeneration.

Woody Residue Treatment

Woody residues, also known as slash, waste or debris, are the woody materials such as trunks, branches, limbs, twigs, needles and leaves created during forestry, agroforestry and horticultural activities and after a damaging natural event such as a blow down. Woody residue treatment is a practice that uses different methods on these materials to achieve specific management objectives. For a complete version of the conservation practice standard, refer to Section IV of the Field Office Technical Guide.

Woody residue treatments will reduce hazardous fuels and risk of wildfire, eliminate habitats for harmful insects and diseases, clear access and improve forage for livestock and wildlife, create openings and soil building materials for seedlings, accelerate decomposition to enrich soil organic matter, lessen the risk of physical harm to livestock and humans, provide feedstock for renewable energy systems and enhance the aesthetics of sites near public access. Treatments that reduce wildfire risk and avoid burning reduce hazards from smoke and fumes.

After forestry activities such as harvesting, forest stand improvement, pruning or brush management the woody materials left on the ground could be considered nutrient sources, soil enrichment materials, commercial products, harmful disease or insect habitats or an ugly waste.

Derechos (straight line winds), tornadoes, winter storms, floods, ice and other severe weather events as well as wildfires and insect and disease infestations result in, standing broken timbers or massive piles of downed woody debris that includes trunks, limbs and branches. These natural disturbances create more dangerous debris threats than human forest management activities.

There are considerations to account for when treating woody residues. The forest litter layers or O horizons and surface soil layers, usually A horizons, maintain a wide variety of ecosystem functions such as nutrient supply, erosion control, water retention and a medium for root development for trees, shrubs, forbs and grasses. Surface soil and litter layers should not be removed and disturbance should be minimized as much as possible. Residue removal could result in increased mortality of small conifer seedlings from direct heat damage and in increased competition from early successional hardwoods.

Specifications

General Specifications Required for All Purposes

Site-specific requirements are listed on the Implementation Requirements. Treatment of woody residues will take into account the condition and extent of the materials to be treated and shall comply with the following specifications.

All activities associated with applying this practice shall comply with state, tribal and local forestry and related laws and regulations. It is the landowner’s responsibility to obtain appropriate permits and/or applications prior to commencing any activities related to this practice.

Soils, site conditions, and timing of application must be suitable for any ground-based equipment used for woody residue treatment to avoid excessive compaction, rutting or damage to the soil surface layer. For safety purposes and to protect site resources including residual trees, treatment methods involving ground-based heavy equipment are generally not applied on slopes exceeding 20 percent.
Web Soil Survey ratings for Harvest Equipment Operability, Haul Roads, Rutting Hazard and Erosion Hazards of severe, very severe or poorly suited require additional analysis on whether or not to implement the practice and a plan to reduce or eliminate the risks and hazards if the practice is implemented; for example, determining the timing, method and intensity of the practice or planning supplemental practices. A moderate rating will require additional analysis to determine whether supplemental practices are needed to adequately protect the resources. These analyses must be documented in the case file.

High levels of biomass removals may impact some Minnesota soils; for example: soils that are very shallow over bedrock or are deep ombrotrophic peats (all water is from precipitation, not stream or spring fed) – which have lower nutrient capital than the average soil. Removing biomass will negatively affect their productivity.

Wounds and branch stubs are major vectors for fungal and bacterial infestations such as cankers, stem decays, galls and blights. Residual trees must be protected during the implementation of the practice; marking either leave trees or remove trees is required. Avoid during early growth periods since tissues are more vulnerable during this time.

For areas with residual trees suitable woody residue treatments include lop and scatter, windrowing and piling, burning, chipping, masticating or crushing, and/or removal.

For areas with few or no residual trees, suitable woody residue treatments include all of the above plus, prescribed (broadcast) burning, and/or removal. Any leave trees should be marked for protection against accidental removal.

Any burning, whether windrows, piles or broadcast, will follow criteria in the Conservation Practice Standard Prescribed Burning (338) and be conducted to minimize heat damage to residual trees, their roots and underlying soil. Even low intensity burns can harm beneficial mycorrhizal fungi and surface feeder roots.

Woody residue removed for improved forage access and growth will be in compliance with current federal, state and local wetland regulations in relation to vegetative removal.

**ADDITIONAL SPECIFICATIONS BY PURPOSE**

**Additional Specifications to Reduce the Risk of Harmful Insects and Disease**

In general dry conditions favor insects and associated diseases while wet conditions favor fungal, viral and bacterial infections.

**Bark Beetles**

Untreated woody residue provides excellent habitat for bark beetles. Bark beetles by themselves may be a serious forest pest but rarely lead to tree death. More importantly they transport fungal pathogens that act as secondary vectors that kill trees. Bark beetles attack weakened and recently broken larger branches and downed trees with or without attached root systems. Once that food supply is exhausted they often attack nearby healthy trees. Both conifers and hardwoods are attacked by bark beetles; conifers are more susceptible than hardwoods. If bark beetles are present or possible, time treatments late summer to early winter (September 1 to January 30) only.

**Fungus, Bacteria, Viruses Including Wilts, Blights, and Yellows**

Wilts, blights and other fungal, viral or bacterial diseases slow growth rates and some will kill trees by plugging either phloem or xylem vessels. Sanitation is the best method to control the spread of these diseases including completely removing infected trunk and branch material from the site. If complete
removal is not possible then debark and chip to less than 1 cu in. or burn the residue. Treat pruned branch collars with pruning paint immediately to stop sap flow and provide a barrier to infection.

**Diseases**

Conifers: needlecasts and blights, rusts, cankers wilts, mildews.

Hardwoods: knots, cankers, galls, blights, wilts and molds.

**Additional Specifications to Improve Access to Forage for Livestock and Wildlife, to Reduce the Risk of Harm to Humans and Livestock, and Enhance Aesthetics**

Woody areas used for livestock grazing require a Prescribed Grazing Plan (528). Remove any large debris that could cause harm or dangerous conditions to the livestock grazing area. Debris should be less than 4 inches in diameter and shorter than 2 feet long. As necessary, use Access Control (472) or Fence (382).

Soil Ratings of severe or very severe for Soil Rutting Hazards should be taken into account when grazing in wooded areas as hooves may damage trees by compacting the soil and destroying surface roots.

Retain slash piles that show evidence of use by wildlife; for example look for black bear dens.

**Additional Specifications to Improve the Site for Natural or Artificial Regeneration**

Use of prescribed fire, at low intensity, is recommended for fire adapted communities. Chipping and mastication exposes the soil mineral layer important for germination of some species such as oaks and walnuts.

Avoid dense slash layers that smother seedlings or cause bent or crooked stems; these seedlings will not recover.

**Operation and Maintenance**

This practice will be maintained for 10 years. Herbaceous and woody invasive species likely to invade the treated site will be monitored and the site will be treated should an infestation occur. Use of Conservation Practice Standards Tree/Shrub Site Preparation (490) and Tree/Shrub Establishment (612) will be used if recommended to fully recover the site. Tree establishment through natural regeneration is allowed as long as the 612 standard criteria are met.