

# Dam Safety- Fact Sheet

Montana Watercourse and Montana Department of Natural Resources and Conservation  
Water Resources Division



## Trees and Brush

Fact Sheet: 5

The establishment and control of proper vegetation is an important part of dam maintenance. Properly maintained vegetation can help prevent erosion of embankment and earth channel surfaces, and aid in the control of rodents. The uncontrolled growth of vegetation can damage embankments and concrete structures and make close inspection difficult.

### Trees and Brush

Trees and brush should not be permitted on embankment surfaces or in vegetated earth spillways. Extensive root systems can provide seepage paths for water. Trees that blow down or fall over can leave large holes in the embankment surface that will weaken the embankment and can lead to increased erosion. Brush obscures the surface, limiting visual inspection, provides a haven for burrowing animals, and retards growth of grass vegetation. Tree and brush growth adjacent to concrete walls and structures may eventually cause damage to the concrete and should be removed.

### Tree Removal

Stumps of cut trees should be removed, and cavities should be filled and covered with a short grass that can be easily maintained and mowed. Stumps can be removed either by pulling or with equipment that will grind them down. All woody material should be removed to about six inches below the ground surface. Stumps of trees in rip-rap cannot usually be pulled or ground down, but can be chemically treated prevent them from continually forming new sprouts.

### Upstream Embankment

Remove all trees, stumps, rootballs, and root systems; clean rootball cavity; and backfill with properly placed and compacted soil. Install rip-rap for wave erosion protection on the upstream slope from about four feet below normal pool elevation to about three feet above normal pool elevation.

### Dam Crest

Cut trees having stump diameters of twelve inches or less flush with the ground and treat the stump with a waterproof sealant to delay stump decay. Completely remove trees having stump diameters of about twelve inches and greater, and backfill rootball cavity with properly compacted backfill soil.

### Downstream Embankment

Cut trees having stump diameters of about six inches and less level with the ground and treat the stump with a waterproof sealant to delay stump and rootball decay. Completely remove all trees having stump diameters greater than about eight inches and backfill the cleaned rootball cavity with compacted backfill soil.

### Lower Portion of Embankment and Toe of Dam

Cut all trees having stump diameters of about four inches and smaller flush with the ground and treat the stump to delay stump and rootball decay. Install a toe drain or subdrain system to lower the subsurface water level. The drain filter system will collect and discharge the seepage. Incorporate major subdrain with tree rootball and stump removal where possible. Remove all trees located up to 30 feet beyond the toe of the downstream slope having stump diameters greater than

about four inches. Install sand filters and drain systems in rootball cavities where seepage boiling and soil piping are likely to occur.

### **Tree Removal Tips**

When cutting trees for removal, at least one to two feet of the stump should be left above the ground, leaving a well-defined stump that can be used in the stump removal process. The stump and rootball should then be removed by pulling the stump upward with a track-mounted backhoe (or similar equipment) after loosening the rootball by pulling on the stump from different directions. The rootball cavity should be cleaned to remove loose soil and the remaining roots in the cavity using a backhoe. The side slopes of the hole are to be no steeper than 1:1. Compacted soil should be a cohesive material, compacted in lifts no greater than 8-inches loose lift thickness on top of a flat bottom.

### **Embankment Maintenance**

Embankments, groins, areas adjacent to spillway structures, vegetated channels, and other areas associated with a dam require continual maintenance of the vegetative cover. Grass mowing, brush cutting, and removal of woody vegetation (including trees) are necessary for the proper maintenance of a dam, dike, or levee. All embankment slopes and vegetated earth spillways should be mowed at least twice per year. Trees and brush should be removed in all areas within 30 feet of the embankment.

Well tended grasses improve aesthetics, simplify inspections, create a non-erodible surface, and discourage burrowing animal habitation. Chemical spraying and burning for the purpose of regular maintenance are no longer acceptable methods of vegetation control near a water body. More acceptable methods include the use of weed whips or power brush-cutters and mowers. If chemical

spraying is used, utmost care should be taken to protect the local environment. To protect the integrity of the embankment, mowing with heavy equipment when wet should be avoided. Only proper equipment designed specifically for the type of slope and vegetation should be utilized following the manufacturer's recommended safe operation procedures.



For more questions, comments, additional fact sheets, and area specific information you can contact DNRC or Montana Watercourse at the addresses below or on the web.

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