



SILVICULTURE FIELD TIP

Field tested ideas.

Contact the author for further information.



Division of Forestry

Field Tip #14

December 2013

MECHANICAL SITE SCARIFICATION AND SEEDBED PREPARATION USING SALMON BLADE

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Background

Natural seeding success is often hampered by undesirable seedbed conditions including a thick organic matter ("duff") layer, unexposed mineral soil, inadequate soil drainage, and dry soil conditions. In recent years, St. Louis County Land Department and DNR Forestry have designed and built a mechanical site prep blade that can expose mineral soil and mix duff less intensively than traditional shearing or raking, thereby minimizing damage to the ground layer.

Purpose

The salmon blade is used to scarify and prepare a seedbed to provide for natural regeneration in seed tree or shelterwood silvicultural systems. It can be used to reestablish paper and yellow birch, northern hardwoods and pine. The salmon blade mixes topsoil and duff together creating a seedbed and incorporating seed already present in the duff layer. The salmon blade is used to scarify sites pre-harvest, but it might have application on appropriate sites following a thinning or final harvest.

Suitable Site Conditions

Hardwood or conifer stands that are level to gently rolling with soils that are dry to moderately moist are suitable for using a salmon blade. Wet soils are not recommended due to the susceptibility for the surface layer to be scraped away. Thin soils with large surface rock and stumps are not appropriate and may result in damage to equipment. Slopes exceeding 30% are not



Figure 1: Dense patch of undesirable vegetation underneath mature birch trees.



Figure 2: Pine overstory with minimal surface rock, well drained soils, and scattered stumps.



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for salmon blading.

Equipment Specifications

The salmon blade is designed to be pushed by a small to medium sized crawler dozer like a JD 450/550 in the 60 -100 hp range. This size dozer should be quite maneuverable in the understory of hardwood or pine stands. The salmon blade is 6' - 8' wide and can be made to attach to the existing dozer blade.

Operational Techniques

The salmon blade is run through a stand with the teeth 2-5 inches deep in the soil. This mixes downed seeds, surface litter, decaying organic matter and underlying mineral soil together. The salmon blade can cut shallow roots and stems of brush and shrub competition clearing openings for seed catch from the overstory. The salmon blade creates furrows in the soil to catch seed and hold moisture increasing seed germination and seedling survival. One trip over an area and a minimum of 50 - 65% area coverage is usually adequate for seedbed and soil disturbance

Costs

Equipment availability, blade installation, vendor experience, and site conditions are important factors in determining costs. Local projects average \$150-300/acre but may be lower if more sites are offered for bid.



Figure 3: Salmon blade mounted on standard dozer.



Figure 4: 50 to 65% soil exposure and duff mixing is adequate for seeds to germinate in mineral soil.