

Maintaining **Soil Productivity** during **Forest** or Biomass-to-Energy Thinning Harvests in the **Western** United States [electronic resource].

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Abstract:

Forest biomass thinnings, to promote **forest** health or for energy production, can potentially impact the **soil** resource by altering **soil** physical, chemical, and/or biological properties. The extent and degree of impacts within a harvest unit or across a watershed will subsequently determine if site or **soil productivity** is affected. Although the impacts of stand removal on **soil** properties in the **western** United States have been documented, much less is known on periodic removals of biomass by thinnings or other partial cutting practices. However, basic recommendations and findings derived from stand-removal studies are also applicable to guide biomass thinnings for **forest** health, fuel reduction, or energy production. These are summarized as follows: (1) thinning operations are less likely to cause significant **soil** compaction than a stand-removal harvest, (2) risk-rating systems that evaluate **soil** susceptibility to compaction or nutrient losses from organic or mineral topsoil removal can help guide management practices, (3) using designated or existing harvesting traffic lanes and leaving some thinning residue in high traffic areas can reduce **soil** compaction on a stand basis, and (4) coarse-textured low fertility **soils** have greater risk of nutrient limitations resulting from whole-tree thinning removals than finer textured **soils** with higher fertility levels.