Geomorphic conditions in salmonid-supporting streams, Umatilla National Forest, northeast Oregon and southeast Washington
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One hundred and twenty-nine stream reaches in the Umatilla National Forest were categorized as healthy or less-healthy, based on the presence or absence of salmonids and the quality of aquatic habitat, and compared for differences in channel characteristics. Relationships between each of twenty-six channel variables and four watershed variables (drainage area, channel gradient, geology, and valley constraint) were also explored to determine which watershed variables influenced channel characteristics. Statistical analyses showed that ten channel variables had statistically significant differences between healthy and less-healthy reaches, and that all four watershed variables significantly influenced channel characteristics. Three separate multivariate analyses of covariance confirmed significant differences in channel characteristics between the healthy and less-healthy reaches. Significantly different channel variables were stratified by influential watershed variables to establish target values. Results presented in this study have important implications for the future health of salmonids, and for land managers responsible for stream management and restoration decisions.