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**Controls on the Size and Occurrence of
Pools in Coarse-Grained Forest Rivers**

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Controls on pool formation are examined in gravel- and cobble-bed rivers in forest mountain drainage basins of northern California, southern Oregon, and southeastern Alaska. We demonstrate that the majority of pools at our study sites are formed by flow obstructions and that pool geometry and frequency largely depend on obstruction characteristics (size, type, and frequency). However, the effectiveness of obstructions to induce scour also depends on channel characteristics, such as channel gradient, width-depth ratio, relative submergence (ratio of flow depth to grain size), and the caliber and rate of bed material supply. Moreover, different reach-scale channel types impose different characteristic physical processes and boundary conditions that further control the occurrence of pools within a watershed. Our findings indicate that effective management of pools and associated aquatic habitat requires consideration of a variety of factors, each of which may be more or less important depending on channel type and location within a watershed. Consequently, strategies for managing pools that are based solely on single-factor, regional target values (e.g. a certain number of wood pieces or pools per stream length) are likely to be ineffective because they do not account for the variety of local and watershed controls on pool scour and, therefore, may be of limited value for proactive management of complex ecosystems.