Prioritizing Stream and Watershed Restoration: A Review of Approaches and a Recommended Interim Method[AFS]

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Hundreds of millions are spent annually on watershed restoration and habitat improvements in the western United States. It is generally accepted that watershed restoration should focus on restoring natural processes that create and maintain habitat rather than manipulating habitats. However, most process-based restoration is site-specific, i.e., conducted on a short stream reach. In an effort to synthesize site-specific techniques into

a process-based watershed restoration strategy, we reviewed the effectiveness of common stream restoration techniques at improving fish habitat, synthesize various methods for sequencing restoration actions, and developed a hierarchical strategy for prioritizing them. The hierarchical strategy we present is based on three key elements: 1) principles of watershed processes, 2) protecting high-quality habitats, and 3) knowledge of effectiveness of techniques. Initially, efforts should focus on protecting areas with intact processes and high-quality habitat. Following a watershed assessment, we recommend that restoration focus on reconnecting isolated high-quality habitats. Once the connectivity of habitats has been addressed, efforts should focus on restoring hydrology, geologic, and riparian processes through improvement and restoration of roads and riparian areas. Instream habitat enhancement should be employed only after restoring natural processes or in cases where short-term improvements in habitat are needed. Other approaches to prioritizing restoration are not completely incompatible with the above strategy. Information on species of interest, project cost, cost-effectiveness, access, ownership and other factors can be used to modify the prioritization method we describe above. Finally, our review of both restoration effectiveness and methods for prioritizing restoration emphasize the need for watershed assessments to understand watershed function and restoration opportunities as well as the need for rigorous monitoring to determine effectiveness of restoration techniques.