

ABSTRACT

WATERSHED APPROACH TO BMP IMPLEMENTATION AND EFFECTIVENESS MONITORING

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Snohomish County Surface Water Management approaches Best Management Practice (BMP) implementation by focusing work in small watersheds (15 square miles or less) to effectively produce measurable changes in water quality and aquatic habitat. We choose relatively small watersheds to focus intensive BMP implementation in an effort to produce improvements in water quality more quickly than in larger watersheds. We initially identify pollution problems through chemical water quality monitoring at the watershed scale. At the sub-watershed scale, we conduct land-use surveys to identify potential sources and areas of concern. We then conduct more extensive water quality monitoring to establish baseline pollutant levels within sub-watersheds. Based on these results, we prioritize problems and work with landowners or businesses to implement BMPs. We monitor BMPs for effectiveness at the project reach scale of several hundred feet. After implementing projects, we monitor at the watershed and sub-watershed scale to test for change. While most of our total maximum daily loads (TMDLs) target reductions in bacteria levels and increases in dissolved oxygen, we include improvements in fish habitat and increases in community education and involvement as goals in our watershed restoration efforts.

We use various watershed assessment techniques to evaluate conditions, to identify water quality and other resource problems, and to prioritize restoration efforts. We survey freshwater mussel populations as general indicators of watershed health and to assess baseline conditions. We use a benthic invertebrate index and chemical water quality monitoring data to identify problems in sub-basins of the watershed. Stream habitat surveys identify physical limitations to fish production that could be moderated or removed by habitat rehabilitation. Intensive temperature monitoring identifies stream reaches where temperatures could be improved by additional riparian vegetation.

Effectiveness monitoring is a key to determine if projects produce measurable changes in water quality and aquatic habitat. Our projects include habitat restoration, fish passage, and BMP implementation for water quality improvements. Staffing limits the number of projects that we can monitor for effectiveness, so we developed criteria for choosing projects. These criteria include projects that are large or costly, are located on big rivers, use experimental designs, have a high risk of failure, have negative impacts if they fail, or have high visibility or community involvement. We develop individual three- to five-year effectiveness monitoring plans for each project based on the specific goals and objectives for that project. Components of the project monitoring plans include: benthic invertebrates, chemical water quality, temperature, vegetation, bank and channel structures, channel morphology, and culvert surveys.

Problems that we have encountered in conducting project evaluation and effectiveness monitoring include having clear project goals articulated by the project designers, developing a database for tracking and analyzing information, funding monitoring beyond one- or two-year project construction budgets, receiving permission for access to private property, developing a multidisciplinary team approach to evaluation, and establishing a non-threatening forum for discussion and use of results.