

Summary of **Traditional BMPs** White Paper
Stormwater Management Program Effectiveness Literature Review
Prepared by Carla Milesi, Cardno TEC, Inc.

Ranked Questions #10

Which combinations of retrofit BMPs in a basin are most effective at reducing pollutants to receiving waters?

Summary of literature review:

The literature available within the database was not able to answer this question. Studies looked at individual retrofit BMPs and showed positive pollutant removal ability, however, no studies looked at which combinations of retrofit BMPs are most effective at reducing pollutants.

Summary of recommended effectiveness studies:

- Perform field studies on existing urban retrofitted BMPs within western Washington to assess their effectiveness at removing a variety of pollutants.
- Conduct a more extensive literature search on which combined retrofitted BMPs are most effective at removing specific pollutants of interest.

To what extent does retrofitting using water quality treatment devices reduce urban stormwater pollution to receiving water bodies?

Summary of literature review:

The limited studies available within the literature database showed significant removals of TSS, total metals, and nutrients. Significant reductions in dissolved metals were also observed at higher influent concentrations.

Summary of recommended effectiveness studies:

Assess the feasibility of adding BMPs to existing developed areas. Investigate what sort of incentives landowners would need to take part in a program.

Once installed, do model predicted quantities of stormwater controls in a basin reduce stormwater impacts enough to support the receiving water's designated beneficial uses?

Summary of literature review:

Only one study within the literature database looked at verifying model predicted BMP effectiveness. That study found the model was a reliable tool to predict sediment removal using grass swales and filter strips. However, the study also noted that few models have been developed that specifically look at BMP effectiveness in urban environments.

Summary of recommended effectiveness studies:

- Conduct field studies to compare model predicted BMP effectiveness to field verified BMP effectiveness.
- Improve BMP models by incorporating urban stormwater runoff data.

Ranked Questions #12

Are existing sizing criteria for vegetative filter strips (based on bioswales) overly conservative?

Summary of literature review:

WSDOT sizing criteria uses a series of calculations to determine filter strip width, with a minimum recommended width of 8 feet. Available studies indicate that filter strips should be a minimum of 16.4 feet wide to have good removal of sediment. Existing criteria do not seem overly conservative.

Summary of recommended effectiveness studies:

- Performance of filter strips generally decreases with increasing flow rates. Conduct effectiveness studies of filter strips in Western Washington where light to moderate rainfall and flow intensities may show increased effectiveness of narrower filter strips.
- Conduct a literature search that is specific to western Washington to assess current widths and effectiveness of filter strips employed in Western Washington.
- Construct and perform field studies on a filter strip that is narrower than eight feet Washington State Department of Transportation (WSDOT) minimum to determine if it meets Ecology's guidelines for basic treatment of TSS.

Which combination of length, width, slope, soil types and vegetation types result in the greatest removal of sediment by vegetative filter strips?

Summary of literature review:

The literature available within the database was not able to answer this question. Individual studies looked at how different design elements affected pollutant removal ability, but no studies looked at which combination resulted in the greatest removal of sediment.

Summary of recommended effectiveness studies:

Perform local field studies on filter strips of varying widths, slopes, and vegetation to determine if there is a design combination that is optimal for the removal of sediment.