Stormwater Action Monitoring

Project Title

Redmond Paired Watershed Study – Status Update

Effectiveness Study

Lead Entity

City of Redmond

Partners

City of Seattle, King County, Kitsap County, U.S. Environmental Protection Agency, U.S. Geological Survey, Washington State Department of Ecology, and Herrera Environmental Consulting

Collectively improving stormwater management

Stormwater Action Monitoring (SAM) is a collaborative, regional stormwater monitoring program that is funded by more than 90 Western Washington cities and counties, the ports of Seattle and Tacoma, and the Washington State Department of Transportation. SAM's goal is to improve stormwater management to reduce pollution, improve water quality, and reduce flooding. We do this by measuring stormwater impacts on the environment and evaluating the effectiveness of stormwater management actions.

Questions about SAM? Send an email to SAMinfo@ecy.wa.gov

Study question



This ten-year study sets out to answer: how effective are combined stormwater retrofits and other watershed-scale rehabilitation efforts at improving habitat and water quality conditions in receiving waters?

Many individual stormwater management techniques have been tested and proven to improve stormwater quality and reduce environmental impacts. But it is not currently known whether our collective stormwater management practices are effective at recovering the health of urban streams. The City of Redmond is accelerating the installation of stormwater facilities in selected areas ahead of the rate of development to provide an early example of targeting stormwater controls.

Stormwater management problem

Healthy streams in western Washington have only moderately altered hydrology. For over a century the region has transformed from forest to urban areas. Small stream aquatic biota and habitats are impacted by changes to hydrology and pollutants from runoff.

Until very recently, most of western Washington was developed without what is now considered necessary infrastructure and construction practices to protect aquatic habitat in urban watersheds from stormwater impacts. Local, state, and federal government agencies are implementing various programs and regulations intended to create healthy aquatic habitat in urban areas.

Since 2014, new stormwater management approaches are required to control runoff volumes and reduce pollutants in areas of new development and re-development. Additional retrofitting of older stormwater infrastructure above and beyond current requirements is probably needed to increase the pace and certainty at which urban waterbodies can be recovered to healthy conditions.

Project status and expected findings



This is a long-term effectiveness monitoring project to measure the health of streams as Redmond implements an aggressive retrofitting and restoration program designed to improve in-stream conditions. The project began in 2015 and the first two years of data collection have established baseline conditions in watersheds to be retrofitted and in control watersheds

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where retrofits are not planned or funded. In 2017, Redmond began constructing the first retrofit projects and restoration programs. The goal is to get ahead of development and to see measurable improvements in the streams, with the ultimate goal to recover these urban water bodies to healthy conditions within a decade.

Redmond conducted a statistical simulation to choose meaningful metrics and design monitoring to measure trends and assess the health of the study streams. In years 4, 6, 8, and 10 of this project, Redmond will report on trends by summarizing the results of statistical analyses performed on data from all previous years of monitoring. In these reports, Redmond will evaluate potential relationships between the rehabilitation efforts and observed improvements in the receiving water conditions.

Recommendations

This project will continue to gather data that informs the region within the next decade if Redmond's long-term stormwater management strategy in these watersheds is effective at recovering the urban streams.

The paired watershed study design allows for other local governments in western Washington to use the data to measure their effectiveness at recovering urban streams. Local governments could do similar monitoring of streams where they are trying to improve conditions. Data from this study for both control and reference streams can be used in other studies to evaluate in-stream responses. We can differentiate between natural variations and responses to recovery actions.

Other local governments should follow this project. The findings can be used to refine stormwater management programs and will help federal and state agencies assess whether current regulations and program requirements are effectively improving stream conditions in urban areas.

Why does this study matter?

Planning and construction of stormwater retrofitting projects is expensive. Stormwater managers and policy makers want more certainty of success before widespread implementation of these projects. The public wants to know that their tax dollars are being spent to improve conditions in their local water bodies. This study will tell us whether going "all-in" on combined retrofit and restoration projects delivers a return on these investments that is measurable within a decade.

What should we do with this information?

Stormwater managers should continue to gather the information necessary to understand the current conditions in their local receiving waters. Permittees should consider the hydrology and water quality impacts of their municipal separate storm sewer discharges to these water bodies in relation to other problems in their watersheds and, if appropriate, develop programs to target aspects of stormwater management in key areas of these watersheds where receiving water conditions are likely to measurably improve as a result.

What will Ecology do with this information?

Ecology will continue to fund stormwater infrastructure retrofits and other restoration and recovery efforts – particularly those identified and prioritized through science-based planning efforts. Ecology may determine that changes to municipal stormwater permit requirements are needed to meet Clean Water Act goals of protecting and restoring beneficial uses in receiving waters.





For more information

Go to www.ecology.wa.gov and search for "SAM paired watershed."

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