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413.01 Introduction

This chapter includes information pertaining to WSDOT projects that might benefit from the use of watershed-based tools that allow rapid assessment of environmental conditions in a selected watershed, portion of a watershed, or set of watersheds. The products of these studies have many benefits, including providing a detailed list of mitigation opportunities and much high-quality and detailed environmental information that can give you a huge head start on producing environmental documentation. Additionally, GIS data and maps created during the watershed characterization can be of great value during the rest of the project.

(1) **Summary of Requirements**

Watershed-based evaluation of mitigation opportunities is not required by any laws or rules; rather, it is a way we can save time and money while selecting higher quality mitigation options.

(2) **Abbreviations and Acronyms**

Abbreviations and acronyms used in this chapter are listed below. Others are found in the general list in **Appendix A**.

GIS Geographic Information Systems
WRIA Water Resource Inventory Area; see glossary

(3) **Glossary**

See **Appendix B** for a general glossary of terms used in the EPM.

Watershed Characterization – A process that describes the extent of human alteration to natural watershed conditions at a coarse scale using an interdisciplinary approach to the collection and analysis of landscape-scale information.

*Web sites and navigation referenced in this chapter are subject to change. For the most current links, please refer to the online version of the EPM, available through the WSDOT Environmental Services Office (ESO) home page: <http://www.wsdot.wa.gov/environment/>

Water Resource Inventory Area (WRIA) – A major watershed in Washington, as defined in Chapter 173-500 of the Washington Administrative Code. The state is divided into 62 WRIsAs. For a WRIA map, see the Department of Ecology’s Web site:

☞ <http://www.ecy.wa.gov/services/gis/maps/wria/wria.htm#get>

413.02 What is Watershed Characterization?

(1) *Watershed Characterization*

Watershed characterization is a methodology that allows rapid assessment of environmental conditions in a selected watershed, portion of a watershed, or set of watersheds. For WSDOT, we usually use a watershed study area that encompasses large parts of the WRIA (or multiple WRIsAs) that includes the transportation project we are addressing.

Watershed characterization can provide information about restoration opportunities as well as a substantial body of environmental baseline data usable for other purposes. It must be noted that candidate mitigation sites are developed through aerial photo interpretation and still require the detailed site-scale assessment to determine actual restoration feasibility and mitigation potential.

Watershed characterization’s main product is a ranked list of potential mitigation sites with detailed information about conditions at the sites. We can create a database of potential restoration sites which may be prioritized based on a variety of criteria, depending on the mitigation needs of a proposed transportation project or projects. The databases can be extremely large; for our characterization related to proposed work on SR-167, we evaluated nearly 4,000 riparian areas, over 1,700 wetland areas, 67 floodplain areas, and 10 stormwater retrofit sites for mitigation potential and environmental benefit. Of these sites, 1,026 potential wetland, floodplain and riparian restoration sites met our minimum criteria for potential use for mitigation. We prioritized those sites for optimizing overall ecosystem function. In addition, 569 sites (559 potential wetland, floodplain, and riparian restoration sites and 10 stormwater retrofit sites) met minimum criteria for potential use for stormwater flow control. We prioritized those sites for stormwater flow control.

413.03 What Can Be Gained From Using Watershed Characterization?

Watershed characterization has many benefits. Some of these are discussed in the following paragraphs.

As noted above, the main product is a detailed, ranked list of potential mitigation sites. These lists not only provide a wide range of mitigation options, but the analysis provided by watershed characterization can be invaluable when negotiating with permitting agencies.

At the same time, the quality and quantity of environmental information produced can give you a huge head start on producing a BA, EIS, or other documentation. The reports include detailed baseline environmental data about conditions in the project area as well as the greater study area used in the watershed characterization.

The GIS data and maps created during the watershed characterization can be of great value during the rest of the project. They give a head start on producing the maps needed in environmental documentation.

The prioritized lists of potential mitigation sites give the most comprehensive set of mitigation items ever collected for mitigation of transportation projects.

Watershed characterization is very cost-effective when compared to consultant-produced early action mitigation plans. Consultants often produce a list of 10 to 15 potential sites after lengthy and expensive contracts. For example, as noted above, WSDOT's SR-167 study produced a list of over 1,000 potential mitigation sites.

Watershed-based mitigation has potential to provide options that are much more economical than stormwater vaults. In part, this is due to the fact that sites away from the transportation corridor may have less expensive real estate. Moreover, restoration sites with existing hydrologic conditions conducive to maintaining wetland conditions may be much less expensive to develop and maintain than sites where the hydrology was never conducive to maintaining wetland conditions or has been so modified as to make this the case.

Watershed-based mitigation can provide options that are far more beneficial to the overall goal of full watershed recovery than traditional on-site mitigation. Not only does this make WSDOT a better "watershed citizen," it can help in the permitting process by involving local entities, tribes, and other concerned groups as advocates of our projects.

413.04 What Watershed Characterization Tools Are Available?

Several tools have been developed (or are in development) to assist in addressing the impacts and mitigation of transportation projects through watershed characterization. Here is a brief review of some of them. For greater details, see staff from the appropriate Environmental Services Office programs.

Watershed Screening Tool – A GIS-based tool that allows a rapid review of proposed transportation projects to identify which projects or sets of projects would have the most expensive or otherwise problematic mitigation. The basic methodology and models for this have been developed, while the GIS interface is under development in the fall of 2006. For details, talk to staff from the Watershed Program.

Watershed Characterization Methods – WSDOT has developed a detailed watershed methods document (*Enhancing Transportation Project Delivery Through Watershed Characterization: Methods Document*, WSDOT, updated 2006).

The methods document provides a thorough introduction to watershed characterization, followed by a detailed step-by-step methodology. This detailed, step-by-step methodology for performing a watershed characterization provides replicable and scientifically defensible results.

For the current version of the methods document, as well as other related documents, see WSDOT's Web site:

☞ <http://www.wsdot.wa.gov/Environment/Watershed/characterization.htm>

For more details, talk to staff from the Watershed Program.

Watershed-related GIS Capabilities – The ESO GIS team has developed tools and expertise to conduct watershed characterization. For details, talk to staff from the Environmental Information Program.

Hydrologic Models – Watershed Program staff have cooperated with the Department of Ecology and consultants to develop models to help project engineers to demonstrate the benefits of alternative mitigation sites, especially for stormwater control. For details, talk to staff from the Watershed Program.

413.05 When Should Watershed Characterization Be Used?

Watershed characterization should be used when the screening tool indicates that a project or projects in urban or otherwise constrained sites will be likely to have expensive or non-existent mitigation opportunities. For details, talk to staff from the Watershed Program.

413.06 How Do I Use the Watershed Characterization Process?

The first step should be to discuss the project or projects with the Watershed Program staff.

Watershed Program staff will review the situation, use the screening tool, and discuss the options with you.

If the use of the full-scale watershed characterization methodology seems appropriate, Watershed Program staff will cooperate with regional staff and local entities to gather the needed background data and complete the watershed characterization.