

PROJECT COMPLETION REPORT

**The Viability of Wetlands
for Urban Surface Water Management
and Nonpoint Pollution Control**

PREPARED BY

THE RESOURCE PLANNING SECTION

OF

KING COUNTY DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT

July 1, 1986

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ABSTRACT

Viability of Freshwater Wetlands For Urban Surface Water Management and Nonpoint Pollution Control: An Annotated Bibliography. Resource Planning Section, King County Department of Planning and Community Development, Seattle, WA., July 1, 1986. Washington State Department of Ecology, DOE Project Number G0086039, 106 pages.

An annotated bibliography was compiled to gather information from the literature that pertains to the use of wetlands for urban stormwater management and nonpoint pollution control. Most of the pertinent literature found relates to the use of wetlands for the treatment of secondary sewage effluent.

Entries were obtained primarily from conference and symposia proceedings, research reports, government publications, and scientific journals. Computer data bases and other prepared bibliographies were also utilized.

Approximately 80 percent of the entries have been annotated. Original author abstracts were used whenever possible.

A summary of the literature reviewed is reported in a paper titled **The Use of Wetlands for Stormwater Storage and Nonpoint Pollution Control: A Review of the Literature.** Resource Planning Section, King County Department of Planning and Community Development, Seattle, WA. 1986.

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ABSTRACT

The Use of Wetlands for Stormwater Storage and Nonpoint Pollution Control: A Review of the Literature. Resource Planning Section, King County Department of Planning and Community Development, Seattle, WA., July 1, 1986. Washington State Department of Ecology, WDOE Project Number G0086039, 20 pages.

There is a limited amount of information in the literature regarding the long-term effects of using freshwater wetlands for stormwater storage and nonpoint pollution control. Much of the related literature pertains to the use of wetlands for sewage effluent treatment. Some work has been done in other parts of the country utilizing natural or artificial wetlands for flood control and/or water quality management. Water quality improvements from these studies show promise, but their direct application to this region is limited. Some researchers believe the characteristics of wastewater and urban runoff are similar enough that findings in the wastewater literature may be analogous to stormwater systems. These findings can be confirmed by careful studies in the Northwest to help fill the gaps in present knowledge.

It is well established in the literature that wetlands improve water quality. The long-term consequences of storing urban stormwater in wetlands is uncertain and is an area of needed research. Information is needed before rational management and policy decisions can be made. Few stormwater and wastewater treatment studies have operated long enough to examine the long-term impacts to wetlands.

This paper summarizes wetlands water quality improvement principles from the literature, and areas of greatest uncertainty regarding the use of wetlands for urban stormwater management.

The annotated bibliography compiled as part of this study is contained in a document titled **Viability of Freshwater Wetlands for Urban Surface Water Management and Nonpoint Pollution Control: An Annotated Bibliography.** Resource Planning Section, King County Department of Planning and Community Development, 1986. 234 citations, 106pp. Seattle, WA.

ABSTRACT

A Research Program to Investigate the Viability of Using Urban Freshwater Wetlands for Stormwater Management and Nonpoint Pollution Control. Resource Planning Section, King County Department of Planning and Community Development, Seattle, WA., July 1, 1986. Washington State Department of Ecology, WDOE Project Number G0086039, 16 pages.

A review of the literature revealed little information on the long-term effects of using freshwater wetlands for urban stormwater management and nonpoint pollution control. This is especially true for freshwater wetlands in the Pacific Northwest.

King County began a study in 1986 to obtain sound scientific data for management decisions regarding freshwater wetlands. This Research Program is one of three products resulting from the first phase of that study. A research technical advisory committee was formed to help formulate a research design that will answer many of the long-term questions regarding the use of wetlands for urban surface water management. A series of research questions were formulated, and a research methodology prepared to answer those questions according to five subject areas: biology, sediments and soils, water quality, groundwater, and hydrology.

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The Viability of Wetlands for Urban Surface Water Management and Nonpoint Pollution Control

Prepared by

The Resource Planning Section

King County Department of Planning and Community Development

July 1, 1986

Reports prepared under Coastal Zone Management Grant G0086037

1. Viability of Freshwater Wetlands for Urban Surface Water Management and Nonpoint Pollution Control: An Annotated Bibliography
2. The Use of Wetlands for Stormwater Storage and Nonpoint Pollution Control: A Review of the Literature
3. A Research Program to Investigate the Viability of Using Urban Freshwater Wetlands for Stormwater Management and Nonpoint Pollution Control

Account Summary

The Resource Planning Section of King County, with the assistance of Coastal Zone Management funds, completed three products on the use of wetlands for surface water management and nonpoint pollution control.

The first product entitled Viability of Freshwater Wetlands for Urban Surface Water Management and Nonpoint Pollution Control: An Annotated Bibliography provides a bibliography of references related to the use of wetlands in wastewater and stormwater control. Approximately 240 citations were identified and compiled. Entries were obtained primarily from conferences and symposia proceedings, research reports, government publications, and scientific journals. Computer data bases and other prepared bibliographies were also utilized. In general, it was found much more work has been done on the use of wetlands for the treatment of secondary sewage effluent than on wetlands use for stormwater management and nonpoint pollution control. Also, much of the research has been done in the East and Midwest, with very little done in the Northwest.

The second product entitled The Use of Wetlands for Stormwater Storage and Nonpoint Pollution Control: A Review of the Literature is a written report describing the state of knowledge on the use of wetlands for urban surface water management and nonpoint pollution control. This report is based on a review of the literature and provides a summary of knowns and unknowns on the use of wetlands and potential impacts.

A major conclusion from the literature was that limited data is available regarding the long-term effects of using freshwater wetlands for stormwater storage and nonpoint pollution control. The abilities of wetlands to improve water quality was well documented and considerable research has been done on the use of wetlands for sewage effluent treatment. Some researchers believe the characteristics of wastewater and stormwater are similar enough that findings in the wastewater literature may be analogous to stormwater uses.

The third product entitled A Research Program to Investigate the Viability of Using Urban Freshwater Wetlands for Stormwater Management and Nonpoint Pollution Control is a description of a wetlands research program. The primary purpose of the research program is to obtain sound scientific data on which to base wetlands management decisions.

The research program was completed in conjunction with the literature search and review noted above. A wetlands research technical committee was formed to assist with the development of the research program. The committee consisted of planners, engineers, researchers and regulators from various levels of government and the University of Washington. The research program is geared to last five years in order to obtain longer-term data on the use of wetlands for urban stormwater management and nonpoint pollution control. Research goals are: (1) to determine the ecological implications of using urban wetlands for stormwater management; and (2) to determine the effect of wetlands on water quality of urban surface water runoff.

The research program covers parameters in biology, sediments and soils, water quality, groundwater and hydrology. Three wetlands will be selected for study. One will act as a control, the second wetland will be studied primarily to determine the effects of degraded water quality on wetlands, and the third wetland will be studied to determine the effects of using a wetland modified to act as an urban stormwater detention site.

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