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# WETLANDS METHODOLOGY

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A Methodology for Defining and Assessing  
Wetlands in the Raritan River Basin

**Upper Raritan Watershed Association, for the  
Raritan Basin Watershed Management Project**

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**METHODOLOGY FOR DEFINING AND ASSESSING WETLANDS  
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## **EXECUTIVE SUMMARY**

An important component of the Raritan Basin project is the analyses of wetlands, an essential indicator of basin health. Information derived from these analyses will aid in the identification and resolution of problems associated with changes in land and water use and to prevent and minimize the impact of development on fish and wildlife and their supporting ecosystems.

Wetlands analyses will focus on change detection and modified wetland categories on watershed, Watershed Management Area and basin levels. Change detection will be analyzed for the alteration of wetlands and degree of wetland loss between 1986 and 1995/97. Modified wetlands will be analyzed by category, change and for their potential use in wetland restoration. The existence of contaminated sites in wetlands and within transition areas will also be analyzed regarding potential harm to wetlands and dependent habitats.

## **ACKNOWLEDGEMENTS**

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- South Branch Watershed Association
- Stony Brook Millstone Watershed Association
- United States Department of Agriculture – Natural Resources Conservation Service
- United States Geological Survey
- Upper Raritan Watershed Association

## 1.0 CHANGE DETECTION

Wetlands change naturally or are altered by human intervention over time. The purpose of this analysis is to document the changes of wetland types and alterations of wetlands to other land use/landcover types between 1986 and 1995/97. It is important to know how and where change affects water/wetland and dependent habitats because of their impact on natural resources, such as water quality and wildlife populations, and natural hazards, such as flooding.

Change detection of wetlands will be analyzed using NJDEP land use/landcover GIS data created by interpretation of 1986 and 1995/97 aerial photography. These data use the Anderson Classification, a land use/landcover classification scheme that is easily understood by the non-expert. Open waters are categorized by type of water body, wetlands by vegetative type and modified wetlands by their modification.

The Cowardin Classification, a relatively complex water/wetlands classification scheme, used for 1986 NJDEP wetlands data, is not being updated for 1995/97 due to budget constraints at NJDEP, and therefore, cannot be used for analysis. The Cowardin Classification provides better information to planners with a biological focus regarding preservation, use management and restoration of wetlands.

It should be recognized that losses and changes below the one acre mapping threshold, or regarding wetlands under heavy tree cover or affected by changes in quality will not necessarily be detected. Changes will be quantified using the most current sub-watershed boundaries data (HUC14 data – a fourteen digit Hydrologic Unit Code) developed by the New Jersey Geological Survey by watershed and aggregated to the Watershed Management Area (WMA) and basin levels.

Water/Wetland types as described by the Anderson Classification are as follows:

- Agricultural wetlands (modified)
- Artificial lakes
- Bays, estuaries and other tidal waters
- Coniferous scrub/shrub wetlands
- Coniferous wooded wetlands
- Deciduous scrub/shrub wetlands
- Deciduous wooded wetlands
- Disturbed wetlands (modified)
- Former agricultural wetland-becoming shrubby, not built-up (developed)
- Freshwater tidal marshes
- Herbaceous wetlands
- Managed wetland in built-up maintained recreation area (modified)
- Managed wetland in maintained lawn greenspace (modified)
- Mixed brush and bog wetlands, coniferous dominate
- Mixed forested wetlands, coniferous dominate
- Mixed forested wetlands, deciduous dominate

- Mixed scrub/shrub wetlands, coniferous dominate
- Mixed scrub/shrub wetlands, deciduous dominate
- Natural lakes
- Saline marshes
- Streams and canals
- Wetland rights-of-way (modified)

The contractor hired by NJDEP to create the 1995/97 land use/landcover data found numerous classification mistakes in the 1986 data while editing them for the 1995/97 update. Corrections of the 1986 data were included in the 1995/97 data. It should also be noted that the data, as of April 2000, are in draft version. Possible changes in the data, according to NJDEP, concern edgematching, the matching of boundaries between GIS coverages. According to NJDEP, if these changes are needed they will be insignificant.

GIS coverages of land use/landcover data were created by NJDEP for each WMA. To create a seamless coverage for the Raritan Basin, GIS coverages for the three WMAs that make up the basin need to be appended. It is important in this process that the common boundaries between coverages are edgematched correctly so there are no data gaps or overlaps in the appended coverage.

## **2.0 MODIFIED WETLANDS**

Modified wetlands, wetland areas changed by human intervention, will also be analyzed using NJDEP land use/landcover data. These areas will primarily be analyzed for potential wetland restoration. Research of wetland restoration techniques will be needed to identify the circumstances in which they can be used and how the data can be used to inform the techniques. A beginning bibliography is attached. This bibliographic search was done to find information relating to the selection of areas for restoration and was confined to the last three years of publication.

Modified wetland types described by the Anderson Classification are as follows:

- Agricultural wetlands
- Disturbed wetlands
- Former agricultural wetland-becoming shrubby, not built-up (developed)
- Managed wetland in built-up maintained recreation area
- Managed wetland in maintained lawn greenspace
- Wetland rights-of-way

Modified wetlands will be quantified by watershed and aggregated to the WMA and basin levels.

### 3.0 EXISTENCE OF CONTAMINATED SITES IN WETLANDS

The most current contaminated sites data will be analyzed for their location in wetlands and transition areas. Sources of contaminated sites data will come from NJDEP and county and municipal agencies if available in appropriate GIS format.

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