



WEST BRANCH DUPAGE RIVER

Biological and Water Quality Study of the East and West Branches of the DuPage River and the Salt Creek Watersheds

Cook, DuPage, Kane and Will Counties, Illinois

Center for Applied Bioassessment and Biocriteria

Midwest Biodiversity Institute

P.O. Box 21561

Columbus, OH 43221-0561

Submitted to:

The DuPage River Salt Creek Workgroup

10 S. 404 Knoch Knolls Road

Naperville, IL 60565

Technical Report MBI/2008-12-3

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Midwest Biodiversity Institute
P.O. Box 21561
Columbus, Ohio 43221-0561
mbi@rrohio.com

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FOREWORD

What is a Biological and Water Quality Survey?

A biological and water quality survey, or “biosurvey”, is an interdisciplinary monitoring effort coordinated on a waterbody specific or watershed scale. This may involve a relatively simple setting focusing on one or two small streams, one or two principal stressors, and a handful of sampling sites or a much more complex effort including entire drainage basins, multiple and overlapping stressors, and tens of sites. The latter is the case with the DuPage River and Salt Creek biological and water quality study in that there were three distinct subwatersheds and a complex setting with multiple and overlapping stressors and sources involved. This is a baseline assessment of existing conditions and is the first such effort of this magnitude that we are aware of in these watersheds. Previous surveys and assessments by Illinois EPA and DNR were done at a much less intense spatial scale. While the principal focus of a biosurvey is on the status of aquatic life uses, the status of other uses such as recreation and water supply, as well as human health concerns, could also be potentially addressed.

Scope of the DuPage River-Salt Creek Biological and Water Quality Assessment

Biological, chemical, and physical monitoring and assessment techniques were employed in order to meet two major objectives: 1) determine the extent to which biological assemblages are impaired (using Illinois EPA guidelines), and 2) determine the categorical stressors and sources that are associated with those impairments. The data gathered here was processed, evaluated, and synthesized as a biological and water quality assessment. As such this study contains a summary of major findings and recommendations for future monitoring, follow-up investigations, and any immediate actions that may be needed to resolve readily diagnosed impairments. It was not the role of this study to identify specific remedial actions on a site specific or watershed basis. However, the baseline data established by this study should provide a firmer basis for developing these types of remedial projects in the future.

Introduction

In 2005 the DuPage River Salt Creek Workgroup (DRSCWG) contracted with the Midwest Biodiversity Institute (MBI) to carry out the data collection and analysis necessary to fulfill the requirements of the DRSCWG watershed-based biological assessment plan (MBI 2006a). Under the plan, a framework for collecting biological, physical and water chemistry samples for the basins of Salt Creek and the West and East Branches of the DuPage River was developed.

During the summer-early fall period of 2006 (West Branch) and 2007 (Salt Creek and East Branch) biological and chemical samples were collected, and physical measures taken from a total of 118 sampling locations including six reference sites.

The information gathered during these surveys represents a baseline of existing conditions, documenting current and past environmental impacts to the reaches from both point source discharges and nonpoint source pollution. Secondly the data gathered can be analyzed in such a way as to guide management decisions for effectively implementing the recommendations provided in the Total Maximum Daily Load (TMDL) reports for each subwatershed amongst other possible management goals. The bioassessment plan (MBI 2006a) described spatial and temporal sampling designs and the indicators and parameters to be collected at each sampling site. It also detailed the type of biological sampling methods for fish and macroinvertebrate assemblages and habitat assessment to be employed. The sampling design employed a combination of systematic and targeted-intensive site selection.

Sample sites (Figure 1) are selected by systematically starting at the downstream terminus of the watershed, and selecting the next upstream site at a fixed interval of one-half the drainage area. Thus, the upstream drainage area of each succeeding point, as one moves upstream, decreases by 50%. This resulted in seven levels of drainage area, starting from 150 mi.², through drainage sizes of 75, 38, 19, 9, 5 and finally 2 mi.². Each level was then supplemented with targeted sites that were situated around points of particular interest such as the outfalls of publicly owned treatment works (POTW), sewer overflows, major stormwater sources, and dams. The number of targeted sites added to this grid is dependent on the density of the sources of interest.

Specific objectives of this study were to:

- 1) Complete a comprehensive assessment of biological assemblages (fish and macro-invertebrates) and habitat within the targeted watersheds.
- 2) Establish a baseline for comparison to future conditions in response to management activities.
- 3) Determine the role of potential stressors at the local reach scale.

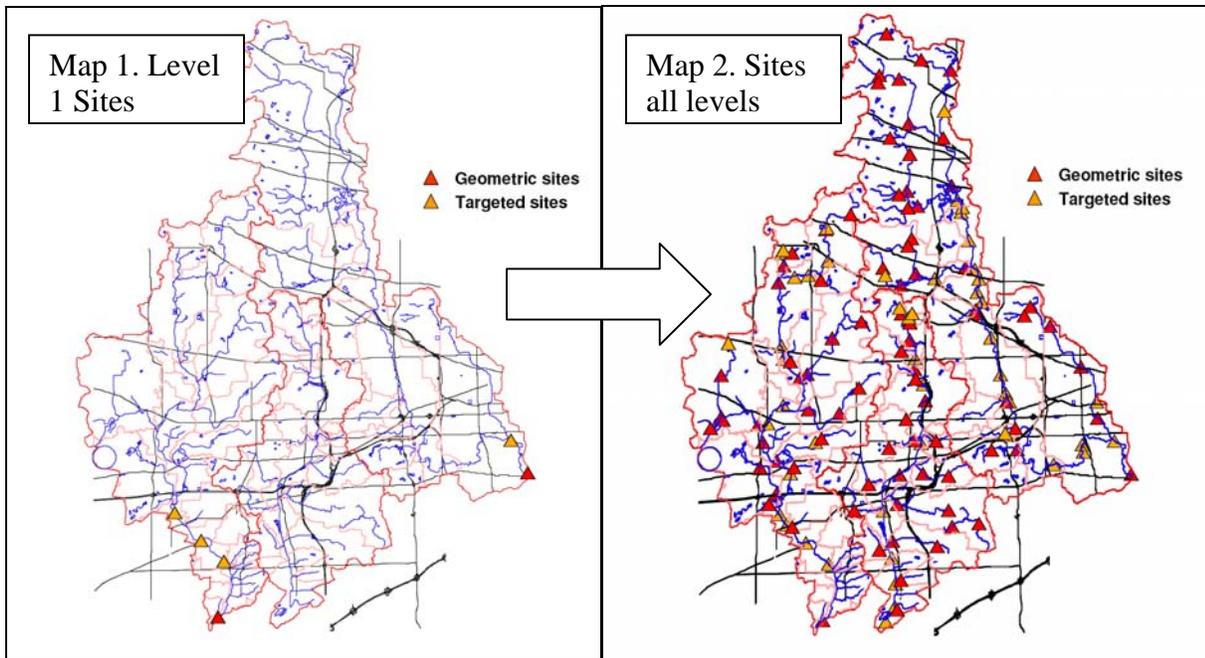


Figure 1 . The location of geometric and targeted sites throughout the DuPage River-Salt Creek study area. Sites are selected using a geometric progression of sites based on subwatershed drainage areas and proceeding through to a drainage area of approximately 2 sq. mi. There were seven levels of drainage areas ranging from 150 mi² for the West Branch and Salt Creek subwatersheds to 75, 38, 19, 8, 4, and 2 mi² levels in all 3 subwatersheds. Targeted sites are added to ensure that specific sources and places are sampled and pollution gradients are detected.