



*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

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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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### Acknowledgements

We would like to thank all of the private and public landowners in all three watersheds that provided access to sampling sites. In addition to those who granted access, the following organizations are thanked for also providing staff to facilitate access: Metropolitan Water Reclamation District of Greater Chicago, Wheaton Sanitary District, Village of Bartlett, DuPage County, Village of Glen Ellyn, Seven Bridges Golf Club, Salt Creek Sanitary District, Fermi Lab, The Morton Arboretum, and the Forest Preserve District of Cook County. We would like to give a special thanks to the staff at the Forest Preserve District of DuPage County and the Downers Grove Sanitary District for providing assistance with site access and equipment storage. The efforts of everyone involved made this project run efficiently and successfully.

This report was prepared in part using U.S. Environmental Protection Agency funds under Section 319 of the Clean Water Act distributed through the Illinois Environmental Protection Agency. The findings and recommendations herein are not necessarily those of the funding agencies.

## Table of Contents

FOREWORD.....	xxiii
Introduction .....	1
Summary.....	3
Relationship to Existing TMDLs.....	6
Study Area Setting.....	10
Summary of Dams in the DuPage River-Salt Creek River Study Area .....	15
Methods.....	27
Biological and Water Quality – Salt Creek .....	33
Salt Creek Pollutant Loadings.....	42
Water Chemistry – Salt Creek .....	65
Sediment Chemistry –Salt Creek.....	78
Physical Habitat Quality of Aquatic Life – Salt Creek.....	81
Salt Creek Biological Communities – Fish .....	89
Salt Creek Biological Communities – Macroinvertebrates .....	93
Biological and Water Quality East Branch DuPage River .....	96
East Branch Pollutant Loadings .....	104
Water Chemistry – East Branch.....	120
Sediment Chemistry – East Branch .....	138
Physical Habitat Quality for Aquatic Life - East Branch .....	142
East Branch Biological Communities – Fish.....	146
East Branch Biological Communities - Macroinvertebrates.....	147
Biological and Water Quality – West Branch DuPage River.....	150
Pollutant Loadings – West Branch.....	157
Water Chemistry – West Branch .....	170
Sediment Chemistry – West Branch.....	176
Physical Habitat Quality for Aquatic Life - West Branch.....	181
West Branch Biological Communities - Fish .....	188
West Branch Biological Communities - Macroinvertebrates .....	190

## List of Figures

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 mi. <sup>2</sup> for the West Branch and Salt Creek subwatersheds to 75, 38, 19, 8, 4, and 2 mi. <sup>2</sup> levels in all 3 subwatersheds. Targeted sites are added to ensure that specific sources and places are sampled and pollution gradients are detected.....	2
Figure 2. Minimum dissolved oxygen concentrations recorded from hourly observations in the West Branch at McDowell Grove, 2006, and in the East Branch at Hidden Lake FP in 2007. The water quality standards for seasonal instantaneous minimum concentrations are shown as dashed lines.....	3
Figure 3. Concentrations of selected water quality parameters measured during the Salt Creek - DuPage River watershed survey stratified by stream size category. Boxes enclose the lower and upper quartiles, whiskers encompass the range of data, outliers are shown as asterisks, outliers more than twice the interquartile range are shown as dots. The shaded area in each plot shows the upper range of concentrations typical of unpolluted waters (USEPA 2000, Ohio EPA 1999, Wetzel 1983).....	5
Figure 4. Left Panel - Fish Index of Biotic Integrity (IBI) scores for the Salt Creek - DuPage River study area plotted against Qualitative Habitat Evaluation Index (QHEI). The trend line is from ordinary least squares regression. Right Panel - QHEI scores for the Salt Creek - DuPage River study area plotted by stream size category. The trend line is drawn through the median value for each size category.....	6
Figure 5. Municipal boundaries and forest preserves in the Salt Creek watershed.....	12
Figure 6. Municipal boundaries and forest preserves in the East Branch DuPage River watershed.....	13
Figure 7. Municipal boundaries and forest preserves in the West Branch DuPage River watershed.....	14
Figure 8. Hierarchy of administrative and environmental indicators which can be used for water quality management activities such as monitoring and assessment, reporting, and the evaluation of overall program effectiveness. This is patterned after a model developed by U.S. EPA (1995a) and further enhanced by Karr and Yoder (2004).....	31

Figure 9. Distributions of macroinvertebrate and fish Index of Biotic Integrity (IBI) scores for sites sampled in 2007 from the Salt Creek basin. Results are stratified by drainage area. The dashed line in each plot shows the minimum score needed for the indicator to meet basic biological quality standards. .... 34

Figure 10. Concentrations (mg/l) of total dissolved solids (TDS) and ammonia-nitrogen (NH<sub>3</sub>) stratified by drainage area for sites sampled in the Salt Creek basin, 2007..... 34

Figure 11. Locations of sites sampled in the Salt Creek drainage referenced in Table 1. For specific location information of each site, see Table 2. Locations of dams and their names (inset key) referenced in the text are noted on the figure as triangles. .... 38

Figure 12. Annual and third quarter (July, August and September) plant flows (top panels) for the MWRDGC EGAN WRP [IL0036340] in relation to the plant’s design maximum and design average (upper and lower dashed lines, respectively). Data points represent reported daily averages and are in units of millions of gallons per day (MGD). Lower left panel, excess flows reported by the plant between 2000 and 2007 subject to secondary treatment standards. Lower right panel, distributions of fecal coliform counts (colonies/100 ml) in the plant effluent for 2000-2007 plotted by month. The limit for fecals (dashed line) applies for the months of May through November. Box and whisker plots show the central tendency of the data and the shape of the data distribution. The boxes bound the 75<sup>th</sup> and 25<sup>th</sup> percentiles data values, whisker define the limits of data falling within 1.5 times the inter quartile range. Values outside the inter-quartile range but within 2 standard deviations of the mean are noted as open points. Asterisks denote outliers. This definition applies to all box plots presented in the document. .... 44

Figure 13. Annual and third quarter effluent concentrations (mg/l) for BOD<sub>5</sub>, TSS and NH<sub>3</sub> (as ammonia-nitrogen) reported by the MWRDGC EGAN WRP [IL0036340] plant plotted by year. Effluent limits for the respective daily maximums are denoted by dashed lines (note that all values were less than the monthly average limits). The April through October limits are shown for both annual and third quarter plots as those limits are the most stringent, and therefore best reveal potential stressful events. .... 45

Figure 14. Annual and third quarter plant flows in millions of gallons per day, and effluent BOD<sub>5</sub> concentrations (mg/l) for the Itasca STP [IL0026280]. Plant design maximum and design average flow are shown in the upper panels as stippled lines. All BOD<sub>5</sub> concentrations were below permitted limits..... 46

Figure 15. Annual and third quarter effluent concentrations (mg/l) for TSS and NH<sub>3</sub> reported by the Itasca STP [IL0026280] plotted by year. Effluent limits for respective monthly averages are denoted by dashed lines. The April through October limits are shown for ammonia..... 47

- Figure 16. Annual and third quarter plant flows (top panels, in MGD) and effluent fecal counts (colonies/100ml) for the Wood Dale North STP [IL0020061]. Plant design maximum and design average flow are shown in the upper panels as dashed lines. The 400 colonies/100 ml fecal daily maximum limit is similarly depicted..... 48
- Figure 17. Annual and third quarter effluent concentrations (mg/l) for cBOD5, TSS and NH3 reported by the Wood Dale North [IL0020061] plant plotted by year. Effluent limits for monthly averages are shown as dashed lines in the annual cBOD5 and TSS plots (note that the respective weekly average limits of 40 and 45 mg/l extend beyond the y-axis). The April through October monthly average and daily maximum effluent limits are denoted by dashed lines for the ammonia-nitrogen plots..... 49
- Figure 18. Upper panels, annual and third quarter plant flows (MGD). Lower panels, effluent fecal counts (colonies/100 ml) for the Wood Dale South STP [IL0034274]. Plant design maximum and design average flow are shown in the upper panels as dashed lines. The 400 colonies/100 ml daily maximum fecal limit is similarly depicted ..... 50
- Figure 19. Annual and third quarter effluent concentrations (mg/l) for cBOD5, TSS and NH3 reported by the Wood Dale North plant [IL0020061] plotted by year. Monthly and weekly average effluent limits for cBOD5 and TSS are denoted by dashed lines. The April through October monthly average and daily maximum limits are shown for ammonia. .... 51
- Figure 20. Annual and third quarter plant flows (in MGD, top panels) and effluent fecal counts (colonies/100 ml) for the Salt Creek Sanitary District WWTP [IL0030953]. Plant design maximum and design average flow are shown in the upper panels as dashed lines. The 400 colonies/100 ml fecal daily limit is similarly depicted..... 52
- Figure 21. Annual and third quarter effluent concentrations (mg/l) for cBOD5, TSS and NH3 reported by the Salt Creek Sanitary District plant [IL0030953] plotted by year. Monthly and weekly average effluent limits for cBOD5 and TSS are denoted by dashed lines. The April through October monthly average and daily maximum limits are shown for ammonia. .... 53
- Figure 22. Annual and third quarter plant flows (in MGD, top panels) and effluent fecal counts (colonies/100 ml) for the DuPage County Nordic Park STP [IL0028398]. Plant design maximum and design average flow are shown in the upper panels as dashed lines. The 400 colonies/100 ml fecal daily maximum limit is similarly depicted. .... 54
- Figure 23. Annual and third quarter effluent concentrations (mg/l) for cBOD5, NH3 and TSS reported by the DuPage County Nordic Park STP [IL0028398] plotted by year. Monthly and weekly average effluent limits for cBOD5 and TSS are denoted by dashed lines. The April through October monthly average and daily maximum limits are shown for ammonia. .... 55

- Figure 24. Annual plant flows (in MGD) and annual effluent concentrations (mg/l) of cBOD5, TSS and NH3 for the Elmhurst STP [IL0028746]. Dashed lines follow the usual conventions of depicting limits. .... 56
- Figure 25. Upper and middle panels, third quarter plant flows (in MGD) and concentrations (mg/l) of cBOD5, TSS and NH3 in relation to applicable limits (as dashed lines). Lower panels, fecal colony counts (per 100 ml) and TSS concentrations (mg/l) plotted in relation to plant flows, 1995 and 2007 ..... 57
- Figure 26. Annual and third quarter plant flows (top panels) annual effluent fecal counts for the Addison North STP [IL0033812]. Plant design maximum and design average flow are shown in the upper panels as dashed lines. The 400 colonies/100 ml fecal limit is similarly depicted..... 58
- Figure 27. Annual and third quarter effluent concentrations (mg/l) for cBOD5, NH3 and TSS reported by the Addison North STP [IL0033812] plotted by year. The weekly average effluent limits for TSS is denoted by dashed lines (note that all cBOD5 values fell below the monthly average limit of 20 mg/l). The April through October monthly average and daily maximum limits are shown for ammonia..... 59
- Figure 28. Concentrations of cBOD5, TSS, flow volume and fecal counts in excess plant flows reported by the Addison North STP [IL0033812] 1998 - 2007. The numbers at the top of the flow plot (lower left) are counts of excess flows reported for each year. Dashed lines show the respective secondary treatment standards. .... 60
- Figure 29. Annual (left panels) and third quarter (right panels) plant flows and cBOD5 concentrations from the Addison South (A. J. Larocca) STP [IL0027367] (note that the weekly average limit for cBOD5 is 20 mg/l). Plant design maximum and average flows are noted in the flow plots by dashed lines. .... 61
- Figure 30. Annual (left) and third quarter (right) effluent concentrations for TSS and NH3 by the Addison South (A. J. Larocca) STP [IL0027367]. The monthly average limit for TSS is noted by a dashed line. The April through October monthly and daily limits are shown for ammonia. Lower panel, annual effluent fecal counts (colonies/100 ml) for May through October 1998-2002 in relation to the 400 colonies/100 ml daily limit ..... 62
- Figure 31. Combined sewer overflow (CSO) discharges reported by the Addison South (A. J. Larocca) STP [IL0027367] 1998-2007. Upper left panel shows the distribution of flow volumes (MGD) by year. The upper right panel shows the same data plotted by month. Lower panels: residual chlorine and BOD5 concentrations in CSO discharges receiving secondary treatment plotted by month for the 1998-2007 time period. BOD5 concentrations in the regularly treated effluent are shown for comparison. .... 63



- Figure 32. Third quarter plant flows, effluent ammonia, BOD and TSS concentrations (mg/l) for the Bensenville South STP [IL0021849]. Dashed lines in the ammonia plot show the monthly average (1.5 mg/l) and the weekly average (3.9 mg/l) limits applicable in July and August. The dashed line in the BOD plot shows the monthly limit. Note all values for BOD were less than the daily maximum of 20 mg/l. The monthly average limit for TSS is 12 mg/l. .... 64
- Figure 33. Concentrations of water quality parameters measured in samples collected from Salt Creek during the summer-fall low flow period in 2007. Locations of dischargers and the confluence with Addison Creek are shown along the top of each plot as a number key. Vertical bars on the x-axis show the locations of dams. Dashed lines in each plot show the upper range of concentrations found in unpolluted water (USEPA 2000, Ohio EPA 1999, Wetzel 1983). Solid lines shows the median values at each river mile..... 67
- Figure 34. Results from continuous monitoring in 2006 of dissolved oxygen concentrations at the Salt Creek Butterfield Road site (RM 15.9) in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. Y-axis units are in mg/l..... 68
- Figure 35. Results from continuous monitoring of dissolved oxygen concentrations at the Salt Creek Fullersburg Woods site (RM 11.0) in relation to various water quality standards for dissolved oxygen, 2006. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. Y-axis units are in mg/l. .... 69
- Figure 36. Results from continuous monitoring of dissolved oxygen concentrations at the Salt Creek York Road site (RM 10.50) in relation to various water quality standards for dissolved oxygen, 2006. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. Y-axis units are in mg/l. .... 70
- Figure 37. Distributions of the daily 24 hour range of dissolved oxygen concentrations recorded by continuous monitors in Salt Creek during 2006 plotted by location and month. Stations are: SCBR, Butterfield Road (RM 15.9); SCFW, Fullersburg Woods (RM 11.0); and SCYR, York Road (10.5). Dashed lines represent range magnitudes of increasing stress to aquatic life ..... 71
- Figure 38. Distributions of daily minimum dissolved oxygen concentrations measured by continuous monitors in Salt Creek at Butterfield Road, Fullersburg Woods and York Road, 2006. Applicable water quality standards for instantaneous minimum dissolved oxygen concentrations are shown as dashed lines..... 71

Figure 39. Distributions of the daily 24 hour range of dissolved oxygen concentrations recorded by continuous monitors in Salt Creek during 2007 plotted by location and month. Stations are: SCBR, Butterfield Road (RM 15.9); SCFW, Fullersburg Woods (RM 11.0); and SCYR, York Road (10.5). Dashed lines represent range magnitudes of increasing stress to aquatic life .....	72
Figure 40. Distributions of daily minimum dissolved oxygen concentrations recorded by automated data loggers as Salt Creek, 2007. Dashed lines show seasonal water quality standards for minimum dissolved oxygen. Station abbreviations are as follows: SCBR, Butterfield Road; SCFW, Fullersburg Woods; SCYR, York Road.....	72
Figure 41. Results from continuous monitoring of dissolved oxygen concentrations at the Salt Creek Butterfield Road site (RM 15.9) in relation to various water quality standards for dissolved oxygen, 2007. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. Y-axis units are in mg/l. ....	73
Figure 42. Results from continuous monitoring of dissolved oxygen concentrations at the Salt Creek Fullersburg Woods site (RM 11.0) in relation to various water quality standards for dissolved oxygen, 2007. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. Y-axis units are in mg/l. ....	74
Figure 43. Results from continuous monitoring of dissolved oxygen concentrations at the Salt Creek York Road site (RM 10.50) in relation to various water quality standards for dissolved oxygen, 2007. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. Y-axis units are in mg/l. ....	75
Figure 44. Mean concentrations of total dissolved solids in water quality samples collected throughout the Salt Creek watershed plotted by categorical level .....	76
Figure 45. Mean concentrations of 5-day biological oxygen demand in water quality samples collected throughout the Salt Creek watershed plotted by categorical level. ....	77
Figure 46. Locations of sediment samples collect in the Salt Creek watershed in relation to municipal wastewater dischargers. Samples are color-coded to the number of polycyclic aromatic hydrocarbons detected at concentrations exceeding levels where negative effects on aquatic organisms are probable.....	79
Figure 47. Locations of sediment samples collect in the Salt Creek watershed in relation to municipal wastewater dischargers. Samples are color-coded to the number of metals detected at concentrations exceeding levels where negative effects on aquatic organisms are probable.....	80

Figure 48. QHEI scores for locations sampled in the Salt Creek mainstem, 2007. The dashed line represents the boundary between excellent and good habitat quality ranges; the shaded region represents the range over which habitat quality is marginal and potentially limiting to aquatic life. Scores less than 45 represent habitats that are overwhelmingly modified in character, and therefore generally not capable of supporting aquatic assemblages consistent with Clean Water Act goals. Sites lacking riffles are noted as filled points. Dam locations are arrayed along the x-axis as diamond-tipped bars. The box plot to the right of the plot shows the distribution of QHEI scores; the box bounds the 25<sup>th</sup> - 75<sup>th</sup> percentiles, the vertical line represents the median score, and whiskers show the outer range of data points. .... 82

Figure 49. QHEI (left panel) and riffle metric (right panel) scores for sites sampled in the Salt Creek catchment, 2007. Scores are color-coded by narrative range..... 78

Figure 50. IBI scores for the Salt Creek mainstem, 2007, plotted by river mile (from the confluence with the Des Plaines River) in relation to municipal wastewater discharges and locations of combined sewer overflows (CSO). Dam locations are arrayed along the x-axis as diamond-tipped bars. Narrative quality ranges are noted on the plot. .... 89

Figure 51. Scatter plots of IBI scores on QHEI scores for the West Branch, East Branch and Salt Creek basins. Coefficients of determination are noted for significant linear associations. Asterisks denote significance levels (single, 0.01<P<0.05; double P<0.01)..... 90

Figure 52. Modified Index of Well-being (MIwb) scores for fish samples collected along the Salt Creek mainstem in relation to wastewater dischargers, CSOs and dams. MIwb scores less than 4.5 are very poor and typically indicate toxicity..... 90

Figure 53. Percent of fish in electrofishing samples collected along the Salt Creek mainstem noted as having either deformities, eroded fins or barbels, lesions and/or tumors..... 91

Figure 54. IBI scores and percent of fish with DELT anomalies for fish sampled from Addison Creek, 2007 ..... 91

Figure 55. Macroinvertebrate IBI (MIBI) scores for the Salt Creek mainstem, 2007, plotted by river mile (from the confluence with the Des Plaines River) in relation to municipal wastewater discharges and locations of combined sewer overflows (CSO). Dam locations are arrayed along the x-axis as diamond-tipped bars. Narrative quality ranges are noted on the plot ..... 94

Figure 56. MIBI and QHEI scores for the Salt Creek mainstem plotted by river mile (left panel), and MIBI scores plotted as a function of QHEI scores (right panel). The arrow points to the same data point in both plots. The two MIBI scores in the right panel falling well below the fitted (LOWESS) line are shown as filled circles in both panels. .... 94

Figure 57. MIBI scores as a function of QHEI score for the Salt Creek, East Branch and West Branch mainstems (left panel), and mainstem tributaries (right panel). Fitted lines are from LOWESS smoothing. The dashed horizontal line shows the boundary between restricted (poor) and limited (fair) narrative ranges. Filled circles indicate sites located in forest preserves, or having comparatively wide riparian buffers.....	95
Figure 58. MIBI scores for sites sampled in the Salt Creek catchment, 2007, plotted by narrative ranges. The locations of POTWs and dams are noted. ....	96
Figure 59. Distributions of macroinvertebrate and fish Index of Biotic Integrity (IBI) scores for sites sampled in 2007 from the Salt Creek basin. Results are stratified by drainage area. The dashed line in each plot shows the minimum score needed for the indicator to meet basic biological quality standards. ....	97
Figure 60. Concentrations (mg/l) of ammonia-nitrogen (NH <sub>3</sub> ) and total phosphorus (TP) stratified by drainage area for sites sampled in the East Branch DuPage River watershed, 2007.....	98
Figure 61. Locations and identification of sites sampled in the East Branch DuPage River drainage referenced in Table 3. Sites that partially meet the Illinois EPA aquatic life goal for general use waters are shaded green. ....	101
Figure 62. Annual and third quarter effluent flows and TSS concentrations from Bolingbrook STP #1 [IL0032689]. The design maximum and average daily flow for the plant is shown by dashed lines in the flow plots. The permit limit for monthly average TSS concentration is 25 mg/l. ....	105
Figure 63. Annual and third quarter concentrations cBOD <sub>5</sub> and NH <sub>3</sub> -N from Bolingbrook STP #1 [IL0032689]. The permit limit for monthly average cBOD <sub>5</sub> concentration is 20 mg/l. Dashed lines in the ammonia plots show the April-October monthly average (3.0 mg/l) and daily maximum (1.5 mg/l) permit limits. ....	106
Figure 64. Excess flows (MGD) subject to secondary treatment standards (40 CFR 133.102; 35 IAC 302.208) for the years 2004 - 2007. The monthly average limits residual chlorine, BOD, and TSS are shown as dashed lines.....	107
Figure 65. Annual and third quarter effluent flows and cBOD <sub>5</sub> concentrations from the DCDPW Woodridge-Greene Valley STP [IL0031844]. The design maximum and average daily flow for the plant is shown by stippled lines in the flow plots. The dashed line in the cBOD <sub>5</sub> plot depicts the monthly average effluent limit. ....	109

- Figure 66. Upper and middle panels, annual and third quarter effluent concentrations for TSS and NH<sub>3</sub> reported by the Woodridge-Greene Valley STP [IL0031844] plotted by year. The monthly and weekly average effluent limits for TSS are denoted by dashed lines. The April through October monthly average and daily maximum limits are shown for ammonia. Lower panels, monthly concentrations of NH<sub>3</sub> and fecal coliform counts for 1998-2007 in relation to applicable permit limits (dashed lines)..... 110
- Figure 67. Annual and third quarter effluent flows and cBOD concentrations from the Downers Grove SD WTC [IL0028380]. The design maximum and average daily flow for the plant is shown by dashed lines in the flow plot. The monthly average cBOD<sub>5</sub> limit for the plant is 10 mg/l..... 111
- Figure 68. Annual and third quarter effluent concentrations for TSS (upper panel) and NH<sub>3</sub>-N (lower panel) reported by the Downers Grove SD WTC [IL028380]. The monthly average limit for TSS is shown by dashed lines (the weekly average for TSS is 24 mg/l). The April through October monthly average and daily limits are shown for ammonia..... 112
- Figure 69. Distributions of monthly maximum and median plant flows by year for the Glenbard Wastewater Authority-Glenbard WWTP [IL0021547]. The design maximum flow of 58 MGD is shown as a dashed lined in both plots ..... 113
- Figure 70. Distributions of annual and third quarter monthly maximum (shaded boxes) and median (open boxes) effluent concentrations of cBOD<sub>5</sub> (top panel) and TSS (lower panel) for the Glenbard Wastewater Authority-Glenbard WWTP [IL0021547]. Weekly and monthly average permit limits are shown as dashed lines..... 114
- Figure 71. Distributions of annual and third quarter monthly maximum (shaded boxes) and median (open boxes) effluent concentrations of ammonia nitrogen for the Glenbard Wastewater Authority-Glenbard WWTP [IL0021547]. Daily maximum and monthly average permit limits are shown as dashed lines ..... 115
- Figure 72. Distributions of monthly maximum (shaded box) and average (open box) effluent flows from the Glendale Heights STP [IL0028967]. The plant design maximum and daily average flows are shown as dashed lines. .... 116
- Figure 73. Third quarter effluent data for the Glendale Heights [IL0028967] Sewage Treatment Plant. Upper left, flow in millions of gallons per day; upper right, total suspended solids in milligrams per liter (mg/l); lower left, 5-day carbonaceous biological oxygen demand (mg/l); and lower right, ammonia nitrogen (mg/l). Dashed lines in the flow plot show the design maximum and the daily average design flow. Dashed lines in the TSS, cBOD<sub>5</sub>, and NH<sub>3</sub> plots show the respective effluent limits for the daily average and monthly maximums..... 117

- Figure 74. Annual and third quarter effluent flows and cBOD concentrations from the Bloomingdale-Reeves WRF [IL0021130]. The design maximum and average daily flow for the plant is shown by dashed lines in the flow plot ..... 118
- Figure 75. Distributions of annual and third quarter effluent concentrations of NH<sub>3</sub>-N(top panel), cBOD<sub>5</sub> (middle panel), and TSS (lower panel) for the Bloomingdale-Reeves WRF [IL0021130]. Weekly and monthly average permit limits are shown as dashed lines..... 119
- Figure 76. Left panel, excess flows as a function of plant flow for the Bloomingdale-Reeves WRF [IL0021130] for the years 1998 through April, 2008. Solid square points are for 2007 and 2008 data. Right panel, distributions of BOD<sub>5</sub> concentrations in excess flows by year. .... 120
- Figure 77. Concentrations of ammonia nitrogen (top panel) and nitrate-nitrite nitrogen (lower panel) in water quality samples collected from the East Branch DuPage River in 2007. Approximate discharge locations of municipal wastewater treatment plants are shown. The diamond-tipped bars along the x-axis show the locations of dams along the mainstem. The dashed line in the ammonia plot shows a threshold concentration beyond which toxicity is likely, and the dashed line in the nitrate-nitrite plot shows the upper limit of concentrations typical for unpolluted waters. .... 123
- Figure 78. Concentrations of total Kjeldahl nitrogen (top panel) and total phosphorus (lower panel) in water quality samples collected from the East Branch DuPage River in 2007. Approximate discharge locations of municipal wastewater treatment plants are shown. The diamond-tipped bars along the x-axis show the locations of dams along the mainstem. The dashed line in each plot shows the upper limit of concentrations typical for unpolluted waters. .... 124
- Figure 79. Concentrations of 5-day biological oxygen demand (top panel) and total suspended solids (lower panel) in water quality samples collected from the East Branch DuPage River in 2007. Approximate discharge locations of municipal wastewater treatment plants are shown. The diamond-tipped bars along the x-axis show the locations of dams along the mainstem. The dashed line in each plot shows the upper limit of concentrations typical for unpolluted waters. .... 125
- Figure 80. Distributions of the 24 hour range of dissolved oxygen concentrations recorded by continuous monitors in the East Branch, 2006, plotted by location and month. The river mile of the location is shown below each station. Stations are: EBAT, Army Trail; EBSC, Saint Charles; EBBR, Butterfield Road; EBHL, Hidden Lake; and EBHR, Hobson Road. Dashed lines represent range magnitudes of increasing stress to aquatic life. .... 126

Figure 81. Results from continuous monitoring of dissolved oxygen at Army Trail Road, 2006, in relation to various water quality standards for dissolved oxygen. The stippled line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period.....	126
Figure 82. Results from continuous monitoring of dissolved oxygen at St. Charles Road, 2006, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period. ....	127
Figure 83. Results from continuous monitoring of dissolved oxygen at Butterfield Road, 2006, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period.....	128
Figure 84. Results from continuous monitoring of dissolved oxygen at Hidden Lake Forrest Preserve, 2006, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period.....	129
Figure 85. Results from continuous monitoring of dissolved oxygen at Hobson Road, 2006, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period.....	130
Figure 86. Distributions of the 24 hour range of dissolved oxygen concentrations recorded by continuous monitors in the East Branch, 2007, plotted by location and month. The river mile of the location is shown below each station. Stations are: EBAT, Army Trail; EBCW, Churchill Woods; EBBR, Butterfield Road; EBHL, Hidden Lake; and EBHR, Hobson Road. Dashed lines represent range magnitudes of increasing stress to aquatic life. ....	131
Figure 87. Distributions of minimum daily dissolved oxygen concentrations recorded by automated data loggers, 2007, in the East Branch. Station locations are: EBAT, Army Trail Road; EBCW, Churchill Woods; EBBR, Butterfield Road; EBHL, Hidden Lake, EBHR, Hobson Road. Dashed lines represent the seasonal water quality standard for instantaneous minimum dissolved oxygen concentration. ....	132
Figure 88. Results from continuous monitoring of dissolved oxygen at Army Trail Road in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period.....	133

Figure 89. Results from continuous monitoring of dissolved oxygen at Churchill Woods in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period..... 134

Figure 90. Results from continuous monitoring of dissolved oxygen at Butterfield Road, 2007, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period..... 135

Figure 91. Results from continuous monitoring of dissolved oxygen at Hidden Lake Forest Preserve, 2007, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period..... 136

Figure 92. Results from continuous monitoring of dissolved oxygen at Hobson Road, 2007, in relation to various water quality standards for dissolved oxygen. The dashed line in each plot shows the water quality standard corresponding to the labeled y-axis and the appropriate time period..... 137

Figure 93. Concentrations of water quality parameters in samples collected from the East Branch and its tributaries stratified by drainage area. The dashed line in each plot shows the upper range of concentrations typical for unpolluted waters ..... 139

Figure 94. Locations of sediment samples collect in the East Branch watershed in relation to municipal wastewater dischargers. Samples color-coded to the number of polycyclic aromatic hydrocarbons detected at concentrations exceeding levels where negative effects on aquatic organisms are probable..... 141

Figure 95. QHEI scores for locations sampled in the East Branch mainstem, 2007. Sites lacking riffles are shown as filled points. Dam locations are arrayed along the x-axis as diamond-tipped bars. The box plot to the right of the plot shows the distribution of QHEI scores; the box bounds the 25<sup>th</sup> - 75<sup>th</sup> percentiles, the vertical line represents the median score, and whiskers show the outer range of data points. Narrative quality ranges are noted..... 142

Figure 96. QHEI (left panel) and riffle metric (right panel) scores for sites sampled in the East Branch catchment, 2007. Score are color-coded by narrative ranges. Dam locations are noted as black squares in the riffle metric plot at right..... 143

Figure 97. IBI scores for the East Branch mainstem, 2007, plotted by river mile (from the confluence with the West Branch) in relation to municipal wastewater discharges. Dam locations are arrayed along the x-axis as diamond-tipped bars. Narrative quality ranges are noted on the plot..... 146



Figure 98. Percent of fish in electrofishing samples showing deformities, eroded fins or barbels, lesions, and/or tumors collected from the East Branch mainstem, 2007 .....	147
Figure 99. Macroinvertebrate IBI (MIBI) scores for the East Branch mainstem, 2007, plotted by river mile (from the confluence with the West Branch) in relation to municipal wastewater discharges. Dam locations are arrayed along the x-axis as diamond-tipped bars. Narrative quality ranges are noted on the plot.....	148
Figure 100. MIBI scores for sites sampled in the East Branch DuPage, 2007, plotted by narrative ranges. The locations of POTWs and dams are noted. ....	149
Figure 101. Distributions of macroinvertebrate and fish Index of Biotic Integrity (IBI) scores for sites sampled in 2007 from the Salt Creek basin. Results are stratified by drainage area. The dashed line in each plot shows the minimum score needed for the indicator to meet basic biological quality standards.....	150
Figure 102. Concentrations (mg/l) of ammonia-nitrogen (NH <sub>3</sub> ) and total phosphorus (TP) stratified by drainage area for sites sampled in the West Branch DuPage River watershed, 2006.....	151
Figure 103. Locations and identification of sites sampled in the West Branch DuPage River drainage referenced in Table 2. Sites that partially meet the Illinois EPA aquatic life goal for general use waters are shaded green. ....	154
Figure 104. Annual and third quarter effluent flows (top panel) for the MWRDGC Hanover Park WWTP [IL003180], 2001 - 2007, in relation to the design maximum and design average (dashed lines). Lower panels, left, excess flows from the plant as a function of plant flow and in relation to the design average; right, excess flows plotted by year. All flow values are in millions of gallons per day.....	158
Figure 105. Annual and third quarter effluent concentrations for BOD <sub>5</sub> , NH <sub>3</sub> and TSS reported by the MWRDGC Hanover Park WRP [IL003180], 2001 - 2007. Effluent limits for respective monthly averages and daily maximums are denoted by dashed lines. The April through October limits are shown for ammonia.....	159
Figure 106. Annual and third quarter effluent concentrations of nitrate-nitrate nitrogen (upper panel) and total phosphorus (middle panel) for the MWRDGC Hanover Park WWTP [IL003180], 2001 - 2007. Lower left panel, fecal counts plotted by month for 2001-2007 data. A 400 fecal colonies/100 ml standard exists for April through October. ....	160
Figure 107. Distributions of monthly maximum (shaded box) and average flows (open box) from the Hanover Park STP [IL0034479] for October, 2006 through January, 2008. The plant design maximum and daily average capacities are shown as dashed lines.....	162

- Figure 108. Third quarter effluent data for the Village of Hanover Park Sewage Treatment Plant #1 [IL0034479]. Upper left, flow in millions of gallons per day; upper right, total suspended solids in milligrams per liter (mg/l); lower left, 5-day carbonaceous biological oxygen demand (mg/l); and lower right, ammonia nitrogen (mg/l). Dashed lines in the flow plot show the design maximum and the daily average design flow. Dashed lines in the TSS, cBOD5, and NH3 plots show the respective effluent limits for the daily average and monthly maximums..... 163
- Figure 109. Annual and third quarter plant flows (top panels) and effluent fecal counts for the BARTLETT WWTP [IL0027618]. Plant design maximum and design average flow are shown in the upper panels as dashed lines. The 400 colonies/100 ml fecal limit is similarly depicted..... 164
- Figure 110. Annual and third quarter effluent concentrations for cBOD5, TSS and NH3 reported by the Bartlett WWTP [IL0027618] plotted by year. Effluent limits for respective monthly averages and daily maximums are denoted by dashed lines. The April through October limits are shown for ammonia. .... 165
- Figure 111. Annual and third quarter effluent flows (top panel) and NH3 concentrations for the Carol Stream WCR ..... 166
- Figure 112. Annual (left) and third quarter (right) effluent concentrations of cBOD5 and TSS in the Carol Stream WRC [IL0026352] effluent, 2000 - 2007..... 167
- Figure 113. Top panels: Annual and third quarter plant flows for the Wheaton SD WWTF [IL0031739]. Lower panels: left, reported excess flows as a function of plant flow (note all excess flows occurred above the design average flow of 8.9 MGD; and, right, TSS concentrations in excess flows subject to secondary treatment standards. Flow values are in MGD..... 168
- Figure 114. Annual and third quarter effluent concentrations (mg/l) for NH3, cBOD5, and TSS reported by the Wheaton SD WWTF [IL0031739], 1998-2007. Effluent limits for respective monthly averages and daily maximums are denoted by dashed lines. The April through October limits are shown for ammonia..... 169
- Figure 115. Distributions of minimum dissolved oxygen concentrations recorded by continuous monitors in the West Branch, 2006, at Arlington Drive and McDowell Grove. Applicable, seasonal water standards for instantaneous minimum dissolved oxygen concentrations are shown as dashed lines in each plot..... 172
- Figure 116. Distributions of 24 h ranges (daytime high to nighttime low) in dissolved oxygen concentrations recorded by continuous monitors in the West Branch at Arlington Drive and McDowell Grove, 2006. .... 172

Figure 117. Distributions of selected water quality parameters for the West Branch basin by size strata. The upper range of concentrations found in unpolluted water is shown as stippled lines in each plot.....	173
Figure 118. Concentrations of total phosphorus (top panel) and nitrate-nitrate nitrogen in water quality samples in the West Branch DuPage River, 2006, in relation to municipal wastewater treatment dischargers. Longitudinal locations of the dischargers are noted by numbers along the top of each graph.....	174
Figure 119. Elemental ratios of total inorganic nitrogen to total phosphorus in water quality samples collected from the West Branch DuPage River, 2006. ....	174
Figure 120. Molar ratios of nitrogen (NH <sub>3</sub> +NO <sub>x</sub> ) to phosphorus (TP) in water chemistry samples collected from the DuPage River-Salt Creek River study area, 2006 and 2007. ....	175
Figure 121. Locations of sediment chemistry samples collected from the West Branch watershed. Samples are color-coded by the number of polycyclic aromatic hydrocarbon compounds detected at concentrations exceeding probable effects levels. ....	178
Figure 122. Locations of sediment chemistry samples collected from the West Branch watershed. Samples are color-coded by the number of heavy metals detected at concentrations exceeding threshold effects levels. ....	179
Figure 123. Probability plots of selected sediment metals concentrations in relation to threshold effects levels (vertical dashed line). The threshold for probable effects (PEL; values listed in lower right of each plot) exceeds the observed distributions in all cases. Solid points show samples collected from Spring Brook. Normal ranges from Illinois lakes given by Mitzelfelt (1996) are: iron 16000-37000 mg/kg; copper 16.7-100 mg/kg; lead 15-59 mg/kg; and mercury <0.15mg/kg.....	180
Figure 124. QHEI scores for locations sampled in the West Branch mainstem, 2006. Sites lacking riffles are noted as filled points. Dam locations are arrayed along the x-axis as diamond-tipped bars. The box plot to the right of the plot shows the distribution of QHEI scores; the box bounds the 25 <sup>th</sup> - 75 <sup>th</sup> percentiles, the vertical line represents the median score, and whiskers show the outer range of data points.....	181
Figure 125. QHEI scores (left panel) and the number of highly influential negative habitat attributes (right panel) for sites sampled in the West Branch catchment plotted by stream size class .....	182
Figure 126. From left to right, frequency distributions of QHEI and substrate scores, number of highly influential negative habitat attributes (MWH_H_ATTR), and riffle, pool and channel scores for sites sampled in the West Branch catchment. ....	183

Figure 127. IBI scores for the West Branch mainstem, 2006, plotted by river mile (from the confluence with the East Branch) in relation to municipal wastewater discharges. Dam locations are arrayed along the x-axis as diamond-tipped bars. Narrative quality ranges are noted on the plot..... 188

Figure 128. Percent of fish in electrofishing samples showing deformities, eroded fins or barbels, lesions, and/or tumors collected from the West Branch mainstem, 2006. .... 189

Figure 129. Macroinvertebrate IBI (MIBI) scores for the West Branch mainstem, 2006, plotted by river mile (from the confluence with the East Branch) in relation to municipal wastewater discharges. Dam locations are arrayed along the x-axis as diamond-tipped bars. Narrative quality ranges are noted on the plot (Restricted = Poor; Limited = Fair; General = Good)..... 190

Figure 130. Macroinvertebrate IBI scores plotted by narrative range for the West Branch DuPage River. Locations of dams and publicly owned treatment works are noted..... 191

### List of Tables

Table 1. Total Maximum Daily Load studies completed or under consideration for development for waterbodies in the DuPage River-Salt Creek River study area compared to leading causes of impairment identified in this study. Note that multiple stressors falling under the rubric of stormwater are a major cause of impairment to all waterbodies in the watershed.....	8
Table 2. Land use types by area and percent for Salt Creek, and the East and West Branches of the DuPage River. Percentages based on total watershed area. Land use data is based on Chicago Metropolitan s Agency for Planning 2005 land use data.....	11
Table 3. Dams in the DuPage River-Salt Creek River Study area referenced in the summary. Letters next to dam names correspond to those in Figures 11, 61 and 103 for the respective watersheds.....	16
Table 4. Attainment status of sites sampled in the Salt Creek drainage, 2007. Status is based on the performance of both the macroinvertebrate IBI (MIBI) and fish IBI. The Qualitative Habitat Evaluation Index (QHEI) rates habitat quality on a scale of 12 to 100, and Modified Index of Well-being (MIwb) gauges fish abundance and diversity on a scale of 0 to 12. ....	35
Table 5. Site location table for the Salt Creek survey area (shown in Figure 11). River mile for a particular stream is measured as the distance upstream from its confluence with a receiving body. Samples are as follows: C, water chemistry; Co, water chemistry with a scan for organic pollutants; D, automated data logger for dissolved oxygen; F, fish community, M, benthic macroinvertebrate community; S, sediment chemistry. ....	39
Table 6. Publicly owned sewage treatment plants that discharge to the Salt Creek watershed. DAF is design average flow, DMF is design maximum flow. The accompanying figure shows the relative contribution of each plant to the average effluent volume for September, 2007.....	42
Table 7. Water quality standards exceedences noted in water quality samples collected from Salt Creek and its tributaries, 2006-2007.....	66
Table 8. Number of polycyclic aromatic hydrocarbons (PAHs), metals, polychlorinated biphenyls (PCBs), and pesticide detections found in sediment samples collected from Salt Creek and its tributaries, 2006, having concentrations that exceed threshold effects levels (TEL) listed in McDonald et al. (2000) or Ontario Ministry of Environment (1993).....	78

Table 9. Habitat attributes for sites sampled in the Salt Creek watershed, 2007. The left block of columns shows habitat features that benefit aquatic life, the middle block shows attributes characteristic of extensive anthropogenic modifications that are highly deleterious to aquatic life, and the right block of columns shows habitat features arising from anthropogenic modifications that are moderately deleterious.....	85
Table 10. Attainment status of sites sampled in the East Branch DuPage drainage, 2007. Status is based on the performance of both the macroinvertebrate IBI (MIBI) and fish IBI. The Qualitative Habitat Evaluation Index (QHEI) rates habitat quality on a scale of 12 to 100, and Modified Index of Well-being (MIwb) gauges fish abundance and diversity on a scale of 0 to 12.....	99
Table 11. Site location table for the East Branch DuPage survey area (shown in Figure x). River mile for a particular stream is measured as the distance upstream from its confluence with a receiving body. Samples are as follows: C, water chemistry; Co, water chemistry with a scan for organic pollutants; D, automated data logger for dissolved oxygen; F, fish community, M, benthic macroinvertebrate community; S, sediment chemistry.....	102
Table 12. Publicly owned sewage treatment plants that discharge to the East Branch DuPage watershed. DAF is design average flow, DMF is design maximum flow. The accompanying figure shows the relative contribution of each plant to the average effluent volume for September, 2007.....	104
Table 13. Water quality standards exceedences noted in water quality samples collected from the East Branch DuPage River and its tributaries, 2006-2007.....	121
Table 14. Number of polycyclic aromatic hydrocarbons (PAHs), metals, polychlorinated biphenyls (PCBs), and pesticide detections found in sediment samples collected from the East Branch DuPage and its tributaries, 2006, having concentrations that exceed threshold effects levels (TEL) listed in McDonald et al. (2000) or Ontario Ministry of Environment (1993).....	140
Table 15. Habitat attributes for sites sampled in the East Branch DuPage River watershed, 2007. The left block of columns shows habitat features that benefit aquatic life, the middle block shows attributes characteristic of extensive anthropogenic modifications that are highly deleterious to aquatic life, and the right block of columns shows habitat features arising from anthropogenic modifications that are moderately deleterious.....	144
Table 16. Attainment status of sites sampled in the West Branch DuPage drainage, 2006. Status is based on the performance of both the macroinvertebrate IBI (MIBI) and fish IBI indicators. The Qualitative Habitat Evaluation Index (QHEI) rates habitat quality on a scale of 12 to 100, and Modified Index of Well-being (MIwb) gauges fish abundance and diversity on a scale of 0 to 12.....	152

Table 17. Site location table for the West Branch DuPage River survey area (shown in Figure 103). River mile for a particular stream is measured as the distance upstream from its confluence with a receiving body. Samples are as follows: C, water chemistry; Co, water chemistry with a scan for organic pollutants; D, automated data logger for dissolved oxygen; F, fish community, M, benthic macroinvertebrate community; S, sediment chemistry.....	155
Table 18. Publicly owned sewage treatment plants that discharge to the West Branch DuPage watershed. DAF is design average flow, DMF is design maximum flow. The accompanying figure shows the relative contribution of each plant to the average effluent volume for September, 2007. ....	157
Table 19. Water quality standards exceedences noted in water quality samples collected from the West Branch of the DuPage River and its tributaries, 2006-2007. ....	171
Table 20. Spearman (rank order) correlations of water column metals, total dissolved solids and total suspended solids.....	171
Table 21. Concentrations of pesticides, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) found in sediment samples collected from the West Branch and its tributaries, 2006. Concentrations listed are those that exceed threshold effects levels listed in McDonald et al. (2000) or Ontario Ministry of Environment (1993). Concentrations exceeding probable effects levels are noted with an asterisk. Concentrations for organics are in µg/kg, and those for metals are mg/kg. ....	177
Table 22. Habitat attributes for sites sampled in the Salt Creek watershed, 2007. The left block of columns shows habitat features that benefit aquatic life, the middle block shows attributes characteristic of extensive anthropogenic modifications that are highly deleterious to aquatic life, and the right block of columns shows habitat features arising from anthropogenic modifications that are moderately deleterious.....	184

## 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.<sup>2</sup>, through drainage sizes of 75, 38, 19, 9, 5 and finally 2 mi.<sup>2</sup>. 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 macroinvertebrates) 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.

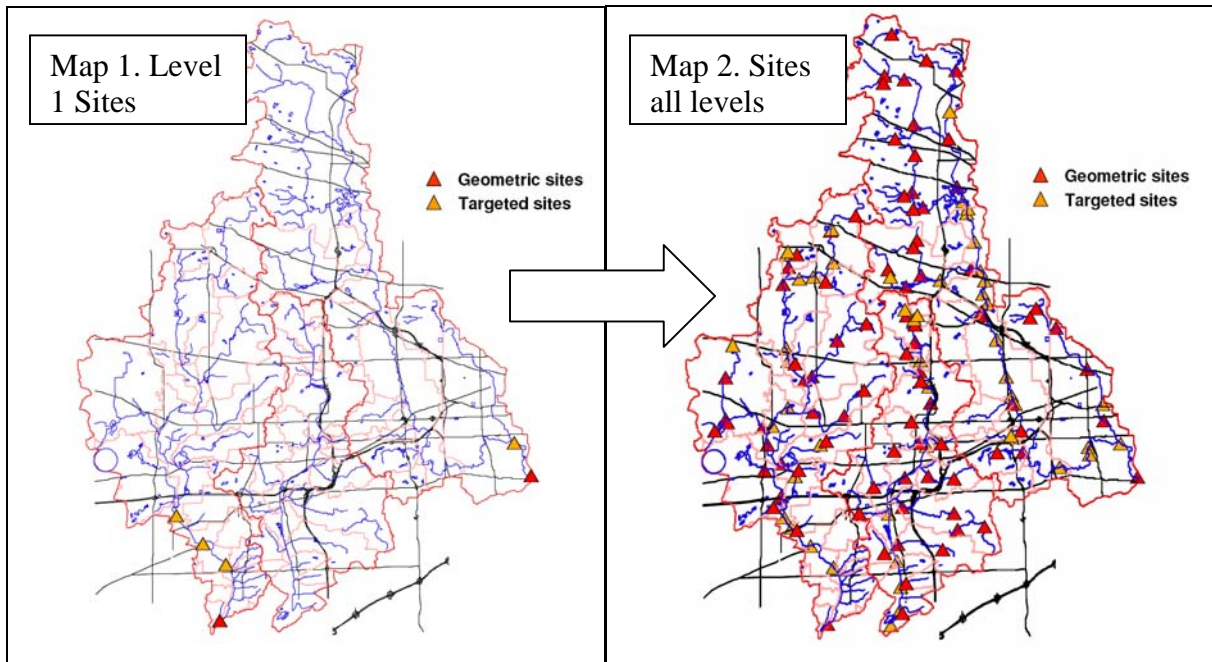


Figure 1 . The location of geometric and targeted sites throughout the DuPage River-Salt Creek study area. Sites are selected using a geometric progression of sites based on subwatershed drainage areas and proceeding through to a drainage area of approximately 2 sq. mi. There were seven levels of drainage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