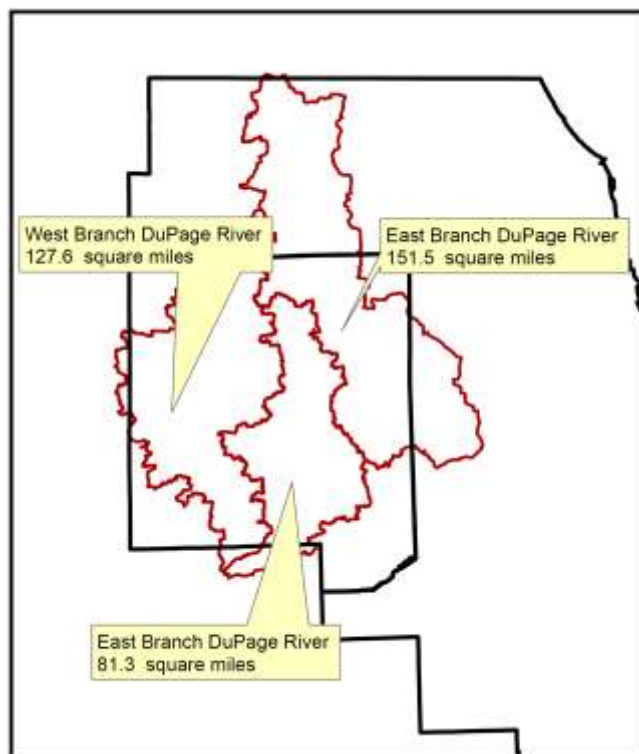


DuPage River Salt Creek Workgroup (DRSCW) Implementation Plan

April 16 2015

General Information

The DuPage River Salt Creek Workgroup (DRSCW) is a coalition of publicly owned treatment works (POTWs), MS4 communities, citizen advocacy groups and professional firms focused on meeting Clean Water Act (CWA) goals in the East Branch DuPage River, the West Branch DuPage River, and Salt Creek watersheds (see location map below), particularly the designated use for aquatic life. The DRSCW was formed to carry out the adaptive management as recommended in the approved Total Maximum Daily Load (TMDL) studies for these watersheds.



The DRSCW is funded by membership dues principally from local government agencies, based on POTW design average flow and their drainage area within the watersheds. Illinois EPA's Section 319 program has also been a significant source of funding.

The DRSCW's adaptive management approach focuses on high resolution, comprehensive monitoring of chemical, biological, and physical characteristics of the watersheds. This monitoring provides the data needed to execute the 'Plan-Do-Check-Act' methodology inherent to adaptive management. Monitoring and analysis provides insight into the highest priority stressors affecting stream health in order to identify projects or initiatives with the greatest potential to attain stream use goals. Monitoring also provides the

feedback needed to properly assess the impacts of cutting-edge stream restoration projects and water quality initiatives to better formulate future activities.

Holistic monitoring and analysis of stream characteristics in the DRSCW program area show that point source loading offers an insufficient explanation for the inability of local streams to support aquatic life in 2013. Based on the empirical evidence, physical anthropomorphic modifications to stream corridors and nonpoint source pollution provide much more compelling explanations. Early projects completed by the Workgroup have focused on dam removal (where marked improvements in stream biological health have already been documented) and chloride reduction. Actions need to be carried out on a scale many times

larger than the Workgroup's current effort, need to be systematically applied over an extended period of time, and need to be guided by a system where actions are prioritized both by nature (physical restoration, pollutant abatement) and space (stream reaches) in order to ensure measurable progress.

The DRSCW has developed and maintains a project prioritization system (Identification and Prioritization System or IPS) that uses monitoring data it has collected to identify priority stressors at a small spatial scale and prioritizes the assessed stream reaches for restoration activities. This prioritization system is used to identify potential projects for further development, including preliminary scopes and costs. Post project monitoring is used to evaluate impacts, identify the next set of activities and improve the design of future projects based on improved understanding of the relationships between stressors and biological communities.

The DRSCW's data and analysis currently shows that major investments in channel form, in-stream and riparian habitat and nonpoint source pollutant abatement at a watershed scale are essential to make efficient and measurable progress towards attaining the designated uses for aquatic life.

The plan presented here-in represents activities that the DRSCW will perform as part of an adaptive management program focused on working towards the aquatic life use goals in the affected watersheds during two 5 year NPDES permit cycles.

This plan includes a list of preliminary projects that will deliver significant and verifiable improvements to local aquatic communities, because they directly address the most significant aquatic life stressors in these particular watersheds. To fund these watershed plan projects, this plan establishes a funding structure that would generate approximately \$7.5M over the initial five-year NPDES permit cycle, and approximately \$15.5 M over the eight year period of the assessment.

The plan is designed to be amended for future planning periods coinciding with future NPDES permit cycles. Project completion and further monitoring and assessment will continually adjust priorities and identify additional projects and activities needed to achieve stream use goals. This implementation plan will be amended to reflect the priority projects and activities that are relevant at the time of subsequent renewal cycles of NPDES permits in the watershed. An amended plan will be available to be referenced when subsequent NPDES permit renewals are needed.

The DRSCW understands that the responsibility to develop this adaptive implementation management plan and associated watershed based priorities rests with the municipalities that choose to pursue implementation of the plan. The workgroup structure is contingent upon DRSCW members making funds available for, and then executing and evaluating the watershed plan projects. All parties understand and agree that the responsibilities and benefits of the implementation plan accrue to all the participating agencies in the program area.

This plan allows public and private managers to allocate their limited financial and human resources to address the most critical problems impinging on aquatic life in a prioritized systematic manner inside a framework of clear environmental outcomes and objectives. These objectives and outcomes are the status and integrity of aquatic assemblages, a primary goal of the Clean Water Act. As such, the objectives of the plan are the same as those of the Clean Water Act. The IPS tool is aimed at moving towards the goal of the Clean Water Act of attaining full support of aquatic communities.

Projects and Activities

The DRSCW has created a prioritized list of preliminary projects and activities which it calculates will improve aquatic assemblages in a measurable and systemic manner (Table 1, depicted geographically in Map 1). The projects were selected by scoring high in the DRSCW's Identification and Prioritization System (IPS) tool, (Appendix 1), or via identification in the DRSCW's TMDL implementation analyses (Appendices 2 & 3). In some instances, these deliver common priorities (Fullersburg Dam modification, chloride reduction BMPs, etc). The IPS is based on extensive monitoring data: assemblages; physical habitat; water and sediment chemistry; land cover analysis; and stream features (dams, outfalls and culverts), and scores projects 1-6 in descending order of priority.

Table 1 lists and describes projects the DRSCW and partner agencies are committed to pursuing during the initial 5 year planning period. A more complete list of projects that will be pursued by member agencies that meet the DRSCWs priorities can be found in the "White Paper- Adaptive Management to meet the Aquatic Life goal". Table 1 includes projected short and long term outcomes. Projects shaded in red will be funded out of the proposed project funding mechanism contained in this plan. Project funding will cover engineering, permitting and construction and post project monitoring (of construction and vegetation integrity). After these projects have been completed, there will be a reassessment of priorities and generation of a second list of priority projects. The second list of projects cannot be generated at this time as they, by the very nature of adaptive management, rely on assessment of the first set of actions. The development of the second set of activities and the other actions shaded in blue, will be funded by membership dues and includes post project impact monitoring (IBI and QHEI) surveys. If an action on either the first or second project lists proves impossible due to engineering or permitting issues DRSCW will select a replacement action from its IPS methodology.

TABLE 1. Priority Projects For Cycle 1

Project Name (Map 1 code)	Drainage basin/ waterbody	Location (RM or Other)	Approximate Activities and Project Description	DO Imp. Project (A2)	IPS Ranking (A1)	TMDL Imp.	Short Term Objectives (1-2 years)	Long Term Objectives (4-6 years)	Schedule	Estimated Cost
Oak Meadows Golf Course dam removal (A)	Salt Creek	23.5	Remove Oak Meadows dam	Yes	3	Yes	Improve average daily DO; decrease Diel	Improve average daily DO; decrease Diel, improve fish passage	Complete 2016	\$250,000
Oak Meadows Golf Course dam removal and stream restoration (B)	Salt Creek	23.5-25	Naturalize 1.5 miles of stream corridor. Construct meanders and cobble substrate. Plant vegetated buffers on riparian land.	Yes	3	No	Raise QHEI from 46.5 to >70.0; reduce nutrients by 760 lbs. P/year, 1521 lbs. N/year, 760 tons sediment/year	Raise mIBI from 21 to > 35 to 1-1.5 miles of river; raise fIBI from 19 to 25 for 1-1.5 miles of river	Complete 2017	\$2,000,000
Fullersburg Woods dam modification (C)	Salt Creek	10.5	Modify dam to improve DO in the upstream impoundment and fish passage.	Yes	1-2	Yes	Improve average daily DO; raise QHEI from 39.5 to >70.0	Raise fIBI from 19 to 27; raise mIBI from 35 to > 42 for 1.5 miles of river	Complete 2021	\$1,500,000
Fullersburg Woods dam impoundment area stream restoration (D)	Salt Creek	10.5-12.0	Naturalize upstream 1.5 miles of stream corridor to include meanders and pool and riffle sequences.	Yes	1-2	Yes	Improve average daily DO; raise QHEI from 39.5 to >70.0; reduce pollutants by 760 lbs. P/year, 1521 lbs. N/year, 760 tons sediment/year	Raise fIBI from 19 to 27; raise mIBI from 35 to > 42 for 1.5 miles of river beyond restored area	Complete 2022	\$1,500,000

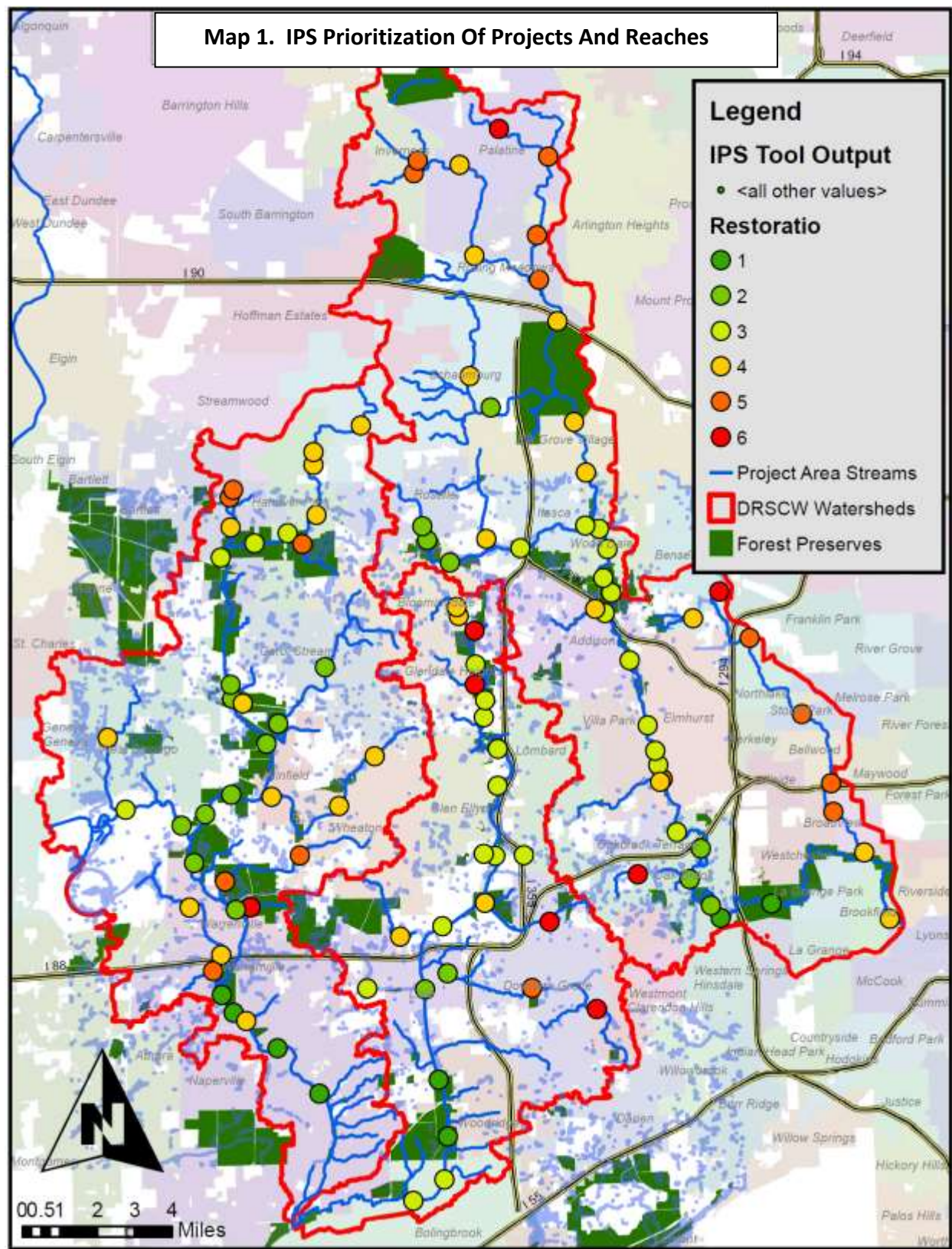
Project Name (Map 1 code)	Drainage basin/ waterbody	Location (RM or Other)	Approximate Activities and Project Description	DO Imp. Project (A2)	IPS Ranking (A1)	TMDL Imp.	Short Term Objectives (1-2 years)	Long Term Objectives (4-6 years)	Schedule	Estimated Cost
Southern West ¹ Branch Physical Enhancement Project (G)	West Branch	Between RM 0 and RM 8 (TBD)	Naturalize 1 mile of stream corridor; pool and riffle sequences and bank reconstruction	No	1	No	Raise QHEI from 70-75 to >77; reduce nutrients by 507 lbs. P/year, 1014 lbs. N/year, 507 tons sediment/year	Raise fIBI from 31- 33 to > 42	Complete 2022	\$500,000.00
Fawell Dam Modification (E)	West Branch	8	Modify structure to allow fish passage to the 24 miles of main stem river upstream.	No	1 -1	No	Create fish passage for target species	Raise fIBI from 17.5 to 27 for 2 miles upstream of project; passage beyond 2 mile area	Complete 2018	\$687,500
Southern East Branch Stream Enhancement Project (F)	East Branch	6.5-8.5	Naturalize 2 miles of stream corridor; construct pool and riffle sequences, cobble substrate and meanders.	No	1-3	No	Raise QHEI from 59-70 to >77. reduce nutrients by 1014 lbs. P/year, 2028 lbs. N/year, 1014 tons sediment/year	Raise fIBI from 27- 35 to > 42; raise mIBI from 27-35 to > 42	Complete 2023	\$2,500,000.00
Spring Brook Restoration (I)	West Branch and Spring Brook	0-2	Naturalize 1 mile of stream corridor; pool and riffle sequences and bank reconstruction	No	3	No	Raise QHEI from 64 to 77; reduce pollutants by 506.66 lbs. P/year, 1014 lbs. N/year, 5066.66 tons sediment/year	Raise fIBI from 21.5 to 22 (post Fawell >27); raise mIBI from 30.1 to >42	Complete 2019	\$1,000,000
Physical Project Total										\$9,937,500.00

¹ Projects coded red are physical improvement projects, projects coded blue are will be funded by membership dues of individual members

Project Name (Map 1 code)	Drainage basin/ waterbody	Location (RM or Other)	Approximate Activities and Project Description	DO Imp. Project (A2)	IPS Ranking (A1)	TMDL Imp.	Short Term Objectives (1-2 years)	Long Term Objectives (4-6 years)	Schedule	Estimated Cost
Chloride Abatement (A3)	All	Program Area Wide	Education program for pre-wetting, anti-icing and equipment calibration	No	Proximate Stressor	Yes	Decrease chloride application rates; increase survey participation by 10 (currently 33); surveyed communities average application rate < 500 lbs./lane mile (currently 3 are higher), 18 surveyed communities anti-ice (currently 12); 33 surveyed communities pre wet (currently 33), zero surveyed communities store exposed salt	Decrease average summer chloride concentrations	Ongoing	\$175,000.00
Basin and project assessments	All	Program Area Wide	Rolling assessment of physical, chemical and biological characteristics.	NA	NA	No	Complete assessment for each basin	Assess project goals attainment; enhance understanding of stressor-response relationships; use information to develop next round of projects	Ongoing	\$929,110.00
Municipal level IPS Implementation Plan	All	Program Area Wide	Design and disseminate an IPS report and summary tailored to individual communities.	No	NA	No		Integrate IPS outputs into local projects and decision making	Complete 2017	\$30,000.00

Project Name (Map 1 code)	Drainage basin/ waterbody	Location (RM or Other)	Approximate Activities and Project Description	DO Imp. Project (A2)	IPS Ranking (A1)	TMDL Imp.	Short Term Objectives (1-2 years)	Long Term Objectives (4-6 years)	Schedule	Estimated Cost
PAH Abatement	All	Program Area Wide	Signed voluntary agreements to discontinue use of coal tar sealants by DRSCW members (MOU).	No	Proximate Stressor	No	75% of members discontinue use of CT sealants for public operations	Area wide ban on sale of CT sealants	MOU goal met by 2018	\$20,000.00
Elgin O'Hare (EOWA) Chloride Offset Program	Salt Creek and West Branch	EOWA envelope	Create and manage offset program for chloride loading increase created by EOWA.	No	Proximate Stressor	Yes	Detailed tracking of Tier 1 agency use in place; ambient monitoring system in place; Tollway and municipal offsets identified	Zero increase in ambient chloride levels following winter operations in EOWA envelope	2019	\$50,000.00
Develop 2nd set IPS projects	All	Program Area Wide	Identify projects for second round of investments (causal analysis and IPS allocation).	No	N/A	Yes	N/A	N/A	List of projects available 2019	\$100,000.00
Continuous DO monitoring	All	Program Area Wide	Collect hourly warm-weather data for DO, pH, Conductivity and temperature.	Yes	N/A	Yes	Add to dataset	N/A	Yearly collection	\$221,920.00
QUAL 2K East Branch and Salt Creek	East Branch and Salt Creek	Relevant Basins	Update QUAL 2K model for East Branch Salt Creek.	Yes	N/A	Yes	Identify next round of DO improvement projects	N/A	2023	\$140,000

Project Name (Map 1 code)	Drainage basin/ waterbody	Location (RM or Other)	Approximate Activities and Project Description	DO Imp. Project (A2)	IPS Ranking (A1)	TMDL Imp.	Short Term Objectives (1-2 years)	Long Term Objectives (4-6 years)	Schedule	Estimated Cost
Point Source Trading Feasibility Study	All	Program Area Wide	Model of marginal costs of TP and TN for each plant is developed	No	N/A	Yes	Evaluate feasibility and environmental impacts of trading concept	Lower marginal costs of meeting P reduction targets	2023	\$200,000
Nutrient Implementation Plan	All	Program Area Wide	Identify phosphorus input reductions by point source discharges, non- point source discharges and other measures, and	No	N/A	Yes	Develop a schedule for implementation of the phosphorus input reductions and other measures at PS and NPS.	Lower marginal costs of meeting P reduction targets	2023	\$200,000
NPS Phosphorous Feasibility Analysis	All	Program Area Wide	Evaluate leaf litter and street sweeping programs.	No	N/A	No			Complete 2021	\$120,000
Grand total for all DRSCW										\$12,123,530.00



Financial and Reporting

DRSCW Agency members are public agencies holding an NPDES permit for a discharge from a publicly owned treatment works or from a municipal separate storm sewer system into the DRSCW watersheds. DRSCW Agency members currently fund the monitoring, assessment and administration activities of the Workgroup through annual dues. Agency members will contribute to project funding through a project assessment amount in addition to their inflation adjusted membership dues.

The project assessment would total \$7,495,002 over the first five year permit cycle, and \$8,243,829 over the subsequent five year permit cycle (where it would run for three years only). This amount would be combined with an approximate 40% match from local project sponsors calculated at approximately 40% of the assessment total making it \$10,492,557 over the two permit cycles. In total the proposal (assessment and match) would create total priority project investment of approximately \$12.5M in projects within the three DRSCW watersheds over the initial permit cycle, and a possible \$26,231,388 total over the two permit cycles (10 years). The proposed funding level would start at \$1.5M in the first year. This initial funding level allows DRSCW and its Agency members to work out the implementation of this new funding initiative and build local support for projects as the funding level increases through the fifth year of the program. The proposed special assessment funding, local matching funds and total project funding for each year are provided in Table 2. Table 2A contains the inflation adjusted membership dues for each year over the same time period.

TABLE 2. Member Special Assessment for First and Second Permit Cycle²

Year	DRSCW Agency Member Project Assessments	Local Matches from Project Sponsors	Total Amount of Annual Project Funding
FY 15-16	\$900,000	\$600,000	\$1,500,000
FY 16-17	927,001	617,999	1,545,000
FY 17-18	1,516,529	1,011,021	2,527,550
FY 18-19	1,562,028	1,041,355	2,603,383
FY 19-20	2,589,444	1,726,296	4,315,740
Subtotal	7,495,002	4,996,671	12,491,673
FY 20-21	2,667,131	1,778,087	4,445,218
FY 21-22	2,747,142	1,831,428	4,578,570
FY 22-23	2,829,556	1,886,371	4,715,927
Subtotal	8,243,829	5,495,886	13,739,715
Totals	\$15,738,831	\$10,492,557	\$26,231,388

Table 2A. Member Dues and Personnel Rates for First and Second Permit Cycle Permit Cycle

Dates	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Total
Dues	\$403,180	\$415,276	\$427,742	\$440,572	\$453,779	\$2,140,549
Dates	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	Total
Dues	\$467,413	\$481,425	\$495,865	\$510,737	\$526,076	\$2,481,516

Participating agencies will: continue funding the DRSCW monitoring, assessment, and administration activities at inflation adjusted current levels through the payment of annual DRSCW Agency member dues; fund project implementation at the level identified here through the payment of an annual DRSCW project assessment; implement agreed upon projects; and report project implementation progress and spending via an annual progress report submitted to Illinois EPA, the first of which will be submitted on March 31st of each year. The DRSCW memo entitled “Updates to Proposed NPDES Permit Special Condition Language and Recommended Agency Member Dues, Agency Member Assessments and Local Project Matches to Implement DRSCW Project Funding Plan”, dated February 16th, 2015, is provided in Appendix 6, and contains a detailed discussion of the proposed funding program as well as the proposed dues and assessments from Agency members for each year of the proposed ten year program.

It must be clearly understood that the estimated project funding total of \$26M contained in this Implementation Plan represents the preferred and targeted funding goal. It is based on 100% participation by all DRSCW Member agencies, which own a POTW discharging into DRSCW watersheds, in the payment of the project assessments each year. A DRSCW Agency member which elects not to participate in the DRSCW watershed implementation plan would not contribute to the proposed project funding but rather would negotiate directly with the Illinois EPA on appropriate limits in their NPDES permit. In addition, the estimated \$26M project funding level is based on the contribution of local matches of 40% of the cost of each individual project from local project sponsors, above and beyond the project funding assessments paid by DRSCW Agency members. The proposed project assessments contained in this Implementation Plan are not subject to a reassessment process should participation by DRSCW Agency members which own a POTW be less than 100% or should local project matches not materialize at the 40% level. It is also anticipated that the estimated project funding level will vary from the annual estimates contained in this plan but that the appropriate funding target is total project funding over the ten year period and the DRSCW will commit to achieving that target.

The cost of this approach to local government entities is assessed at the level needed for successful implementation of the plan. Along with a high probability of moving towards the aquatic life thresholds, it creates an incentive for members to participate, allows local government to offset the risk of investing in an untried methodology by creating short term savings, encourages them to invest outside of their jurisdictions, and, if the program is successful, helps to validate its efficacy. The selection of projects to be funded will start with the projects prioritized by the IPS tool and then proceed to reflect other factors such as readiness to proceed, project sponsors willing to provide local match, etc. as deemed appropriate during the consensus building process of project selection at the DRSCW.

Appendix 1. Monitoring,

Monitoring data and analysis is essential to provide a sound scientific basis to identify impaired waters, diagnose causes of impairment, and conduct adaptive management implementation. Between 2006 and 2012, DRSCW collected physical measures and biological and chemical samples from a total of 118 sampling locations including six reference sites (biological and physical). Continuous dissolved oxygen (DO) data was collected at a further 14 sites. The information gathered during these surveys represents a baseline of existing conditions, documents environmental impacts to the reaches from point source discharges and nonpoint source pollution, and serves as a guide for management decisions. The sampling design employed by DRSCW is a combination of systematic and target-intensive site selection. Sample sites were selected by systematically moving upstream in a watershed at a fixed interval of one-half the drainage area of the preceding site. This resulted in seven levels of drainage area, starting from 150mi², through drainage sizes of 75, 38, 19, 9, 5 and finally 2 mi². Each level was then supplemented with targeted sites around points of particular interest such as POTW outfalls, sanitary sewer overflows (SSOs), major stormwater sources, and dams. Data collected at each site includes fish and macroinvertebrate assemblages (IBIs), habitat assessment (QHEI), water column chemistry (nutrients, metals, oxygen demand and organics), and sediment (metals and organics). Data is collected from late spring through early fall in one basin each year. Thus, there will normally be a three-year cycle for each basin. A map of the sample sites in each basin, including continuous DO sites, is provided in Map 2. The list of water column parameters is supplied in Table 3. Information on the DRSCW's continuous DO monitoring activities is given in Appendix 3.

The monitoring will continue annually under the agreement. Reports will be available by November the year following the survey.

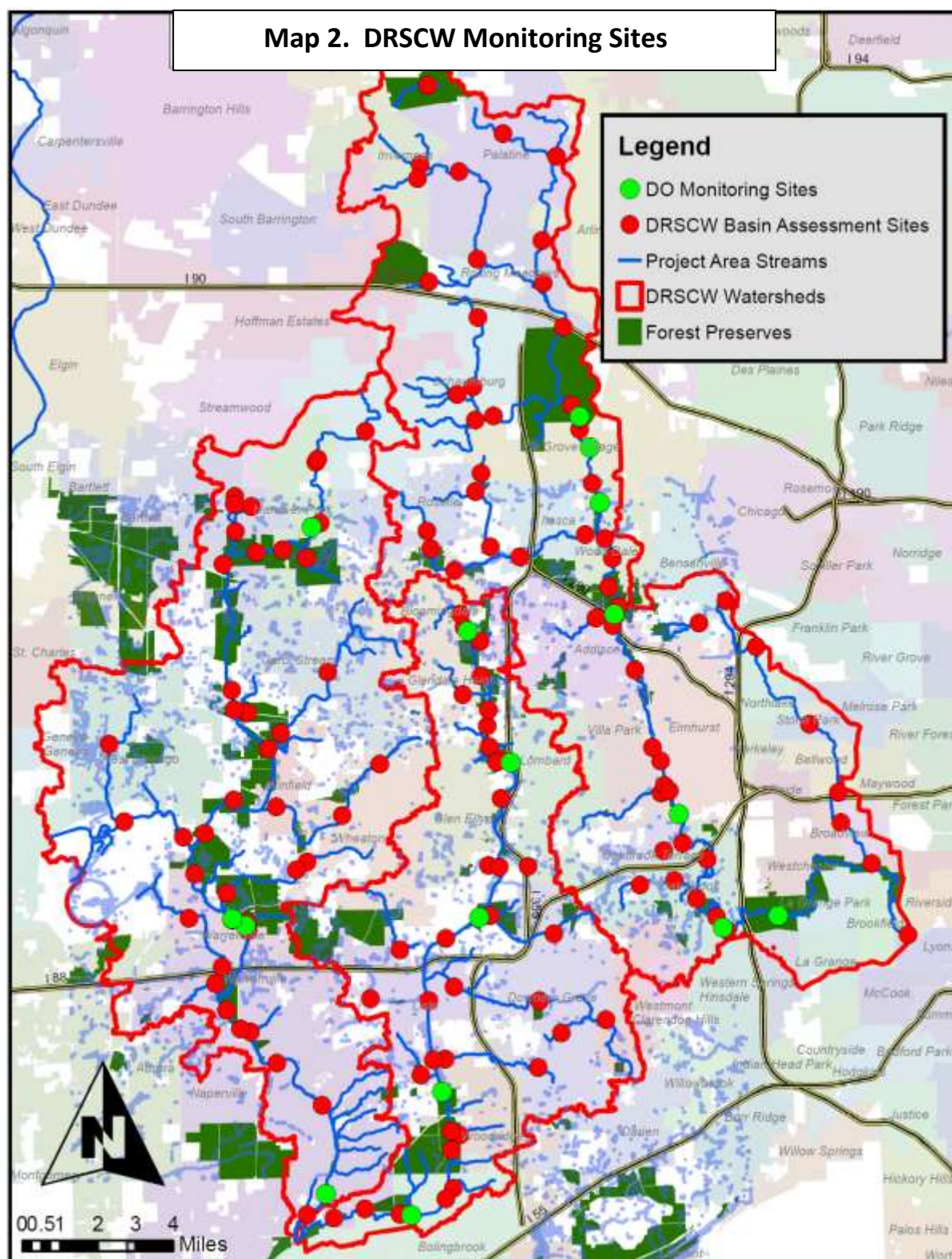


Table 3

Biological and Water Quality Assessment DuPage River and Salt Creek Watersheds

Water and Sediment Chemistry Analysis Parameters

Demand Parameters

5 Day BOD
Chloride
Conductivity
Dissolved Oxygen (continuous and grab)
pH
Temperature
Total Dissolved Solids
Total Suspended Solids

Nutrients

Ammonia
Nitrogen/Nitrate
Nitrogen – Total Kjeldahl
Phosphorus, Total

Metals

Cadmium
Calcium
Copper
Iron
Lead
Magnesium
Zinc

Organics – Water

PCBS
Pesticides
Semivolatile Organics
Volatile Organics

Sediment Metals

Arsenic
Barium
Cadmium
Chromium
Copper
Iron
Lead
Manganese
Nickel
Potassium
Silver
Zinc

Sediment Organics

Organochlorine Pesticides
PCBS
Percent Moisture
Semivolatile Organics
Volatile Organic Compounds

Specific objectives of this activity are to:

- Complete a comprehensive assessment of biological assemblages (fish and macroinvertebrates), habitat and ambient conditions within the targeted watersheds.
- Establish a baseline to compare to future conditions in response to management activities.
- Determine the role of potential stressors at a local reach scale.

DRSCW has completed two assessments for each basin and a third for the West Branch DuPage River was carried out in 2012. Figure 1 shows West Branch DuPage River fIBI scores from 1983 (collected by the Forest Preserve District of DuPage County), 2006, and 2009.

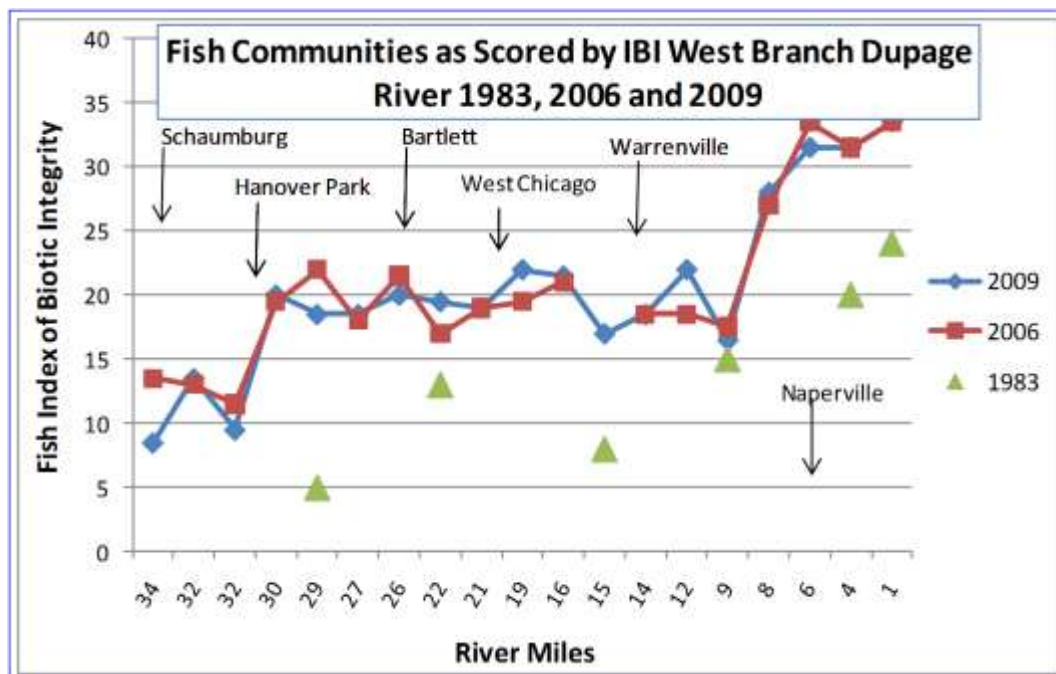


Figure 1 – fIBI scores for the West Branch DuPage River 1983, 2006, 2009. Arrows represent point source inputs from POTWs

Appendix 2. Identification and Prioritization System (IPS)

Active adaptive management calls for a mechanism to integrate baseline data and trend information into management and implementation decisions on an on-going basis. With a solid understanding of the stressors responsible for impairment, based on the analysis of biological responses, DRSCW has developed and maintains a mechanism to select implementation projects that:

- Address the most limiting stressors at a reach level
- Prioritize reaches for intervention
- Establish restoration endpoints
- Provide a level of confidence in the likelihood of success
- Have measurable outcomes

DRSCW uses a number of statistical techniques to look at correlations between observed aquatic communities as measured by IBI and 41 possible stressors. Possible stressors include landscape scale stressors (such as road density and basin size), ambient chemistry (such as chloride and phosphorous concentrations) and physical (using sub components of the QHEI such as measures of buffer width and stream sinuosity). The methods used are based on the EPA's Causal Analysis/Diagnosis Decision Information System (CADDIS) methodology and include cluster analysis, non-metric Multidimensional Scaling and Classification and Regression Trees.

Table 4 lists the nine stressors identified by statistical analysis that best correlate with IBI values in current monitoring data. Quantile Regression is then used to examine the relationship between the individual stressor and the fIBI and mIBI scores. Figure 2 shows a quantile regression between mIBI scores and riparian scores from the QHEI. Such analysis supplies both thresholds for the stressor response in aquatic communities and information for project planners to design restoration projects. To the list can be added physical fragmentation (dams) and Polycyclic Aromatic Hydrocarbons (PAHs). Neither is used in the statistical methodology for methodological reasons but both have explanatory power in IBI variation, the former in longitudinal IBI plots (Figure 1) and the latter is ubiquitous in sediment samples.

Table 4. Proximate stressors identified in the stressor analysis

Riparian score
Riffle score
Channel score
Substrate score
Pool score
Chloride
TKN

A scatter plot showing the relationship between MIBI (Y-axis) and RIPARIAN (X-axis) scores. The Y-axis ranges from 0 to 80, and the X-axis ranges from 1 to 11. Data points are labeled with site codes (e.g., WB01, SC34, EB32). A blue trend line shows a positive correlation between the two variables.

Stream segments are then graded according to their estimated “restorability”. To accomplish this, a composite score based on three factors is created:

- Site score improves if it has proximity to open space (based on GIS analysis of aerial images and land use coverage). Criteria are selected to ensure that sufficient physical space exists in the riparian corridor to allow physical enhancement projects.
- Site score decreases as the number of proximate stressors identified at the site increases (based on the analysis outlined above). Having a low number of proximate stressors is assumed to mean that restoring biological integrity to the site would be less complex than at a site with a large number of proximate stressors.
- Site score decreases as mean deviation from the biological threshold for the IBI rankings (thresholds set by Illinois EPA). This criterion is based on the assumption that segments close to compliance would be easier to steer to full compliance than sites with poor assemblages.

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priority sites with field visits from stream restoration and water quality specialists. Once a site is chosen, projects can be designed based on the data supplied by the tool (targeted on reducing proximate stressors, designed by quantile regression) and by accessing the field data for the site (QHEI subset scores and species data). For example, at sites WB 41 and WB 36 (see RM 8-9 on Figure 1), the proximate stressors are habitat (lack of riffles and a silt mud substrate) and ammonia–nitrogen. Dam modification is suggested, which would allow the river system to correct a number of the stressors (impoundment leading to degradation of in-stream habitat). As Figure 1 shows, dam modification would also allow fish to move upstream, thereby raising IBI scores north of the site. Indeed fish passage is the primary reason that fIBI scores fall so precipitously in that section of river and never recover. The latter note comes from viewing the data spatially and weighting the IPS output. The IPS tool suggests some obvious restoration projects, such as this one, that can be implemented rather quickly and have the highest expectations for restoring biological assemblages. Preliminary priority projects selected by the IPS tool are summarized in Table 1.

DRSCW used 42 stressors in its causal analysis. The list includes land cover stressors (industrial area, road density), water chemistry (chlorides, TSS, a full suite of nutrients including total phosphorus, etc.) and habitat (buffer width, channel sinuosity and similar habitat scoring metrics). The stressors used in the analysis do not directly list physical barriers to fish movement, such as dams or other control structures, although metrics affected by such structures, such as poor habitat or sediment conditions that exist due to the presence of impounded water upstream of a dam, are included. The statistical tool identified certain parameters from a suite of nutrients as stressors with an identifiable correlation to stream biological health. The tool examines relationships between the independent variables and goes further and looks at relationships with the species and taxa from which IBIs are constructed. Ammonia-N and TKN showed significant correlation.

Phosphorus Reductions

Both total phosphorus and the computed nitrogen to phosphorus ratio were evaluated as potential stressors, but a sufficiently strong correlation was not identified between phosphorus and the dependent variables (biological data) to include it in the prioritized list of proximate stressors. This is not an uncommon observation in urbanized watersheds where non-chemical and other chemical stressors exert much stronger effects on the biota. There may also be some covariance with another parameter, such as TKN, serving as a proxy for effects contributed by phosphorus. Phosphorus could manifest as a relevant stressor in the future after more significant stressor effects that may be masking the adverse effects of phosphorus are corrected. In lieu of the application of any new phosphorus limits in the current cycle of NPDES permits, this plan includes the following activities:

Specific Point-Source Actions Surrounding Phosphorus

All POTWs will, at their own expense without financial assistance from the workgroup:

- Monitor phosphorus (total) and nitrogen (total) at all POTWs starting in 2015.
 - At minimum samples will be taken in influent and effluent as a single grab monthly
 - Data will be reported as part of their DMR report and to the DRSCW
- Evaluate the following measures as part of the phosphorus control feasibility study required in their NPDES permit:
 - Modify secondary treatment process sequence with available equipment to reduce effluent phosphorus levels without adversely impacting treatment performance.
 - Identify and reduce sources of phosphorus from generators discharging readily controllable quantities of phosphorus into the tributary collection system, and if applicable, develop and implement appropriate pre-treatment rules.
- Collaborate to gather preliminary data necessary for evaluating and comparing phosphorus reduction costs at each POTW in the program area.

The DRSCW will use its resources to explore and develop potential trading models for achieving targeted watershed scale reductions in nutrient loading.

Selected POTWs or the DRSCW will pursue innovative and alternative phosphorus control strategies:

- Investigate waste chemical clearing-house resources to identify and utilize renewable sources of chemicals that can be used to safely reduce effluent phosphorus in a sustainable manner.
- Evaluate and implement, where practical, nutrient recovery technology to cost-effectively sequester phosphorus from side streams to make marketable fertilizer products.
- Phosphorus removal that is incidental to other pollutant control processes.

Specific Nonpoint-Source Actions Surrounding Phosphorus

The DRSCW will review and report to Illinois EPA inside the time frame set out below on the following NPS actions:

- Enhanced street sweeping basin wide - review member current municipal street sweeping schedule and optimize by system (adoption of high efficiency regenerative air systems), time (concentration of effort in spring and fall) and location (by land use and traffic volume). Enhancement plan including projected nutrient loading abatement and cost estimation ready by 2018.
- All members will review, using in-kind resources, good housekeeping measures and contracts and consider inclusion of specific requirements to prevent cut vegetation from being deposited on impervious surfaces. Enhancement plan prepared by DRSCW with workgroup resources including projected nutrient loading abatement and cost estimation ready by end of 2018.
- Leaf litter management. DRSCW will follow the study being undertaken in Madison, Wisconsin about efficiency of leaf collection programs. If the program is cost effective, then DRSCW will use its resources to prepare an implementation plan in place one year after the study is published (approximately 2018). Review of member policies will be available by 2016. Member agencies are expected to provide in-kind services to assist with plan preparation.
- Use workgroup resources to conduct targeted public education on best management practices that reduce phosphorus loading within the watersheds (pilot test on one sub watershed).
- DRSCW will use its resources to review the interest in organizing a phosphorus reduction workshop modeled on its successful chloride reduction workshops to be aimed at municipalities, landowners and contractors. If market research showed that such a workshop would have an audience and was likely to have measurable impacts, then it would commence in the fall of 2015 using workgroup resources.

Appendix 3. TMDL Implementation: Dissolved Oxygen

Project Background

In 2004, the Illinois EPA completed Dissolved Oxygen (DO) TMDL studies for several main stem reaches of Salt Creek and East Branch DuPage River. In order to achieve the Illinois DO standards, the TMDLs recommended concentration limits on CBOD5 and ammonia-nitrogen on area POTWs based on outputs from QUAL2E models developed for each waterway. The TMDL studies noted that POTW load reductions for oxygen demanding pollutants might be reduced if dam removal was implemented and that this could be further evaluated. Reactions to the TMDLs were unfavorable. POTW operators pointed to the large costs associated with reducing wastewater loadings; the Illinois Association of Wastewater Agencies (IAWA) estimated compliance costs at \$48 M dollars for Salt Creek alone, and had reservations about the accuracy of the modeling outputs. IAWA noted that the models utilized design average flow (DAF) as opposed to actual flows, NPDES loadings as opposed to actual discharge loadings, data used were over seven-years old, and that the models had not been validated. All stakeholders, including the reports' authors, were skeptical that the reductions would improve aquatic biology, noting, "DMR data for POTWs show that average summer values for CBOD5 and ammonia are below the proposed limits.....thus it may be that these limits can be met with little or no additional treatment." (CH2M Hill 2004) While this statement admitted that the TMDLs conclusions were in error, it did not account for the erasing of the margins of safety needed by POTWs to operate under their permit levels which would now require waste water infrastructure investments to maintain. Environmental advocacy groups and the regulated community both questioned the accuracy of the models because they were not based on actual performance data and were not calibrated against ambient data.

In 2005, the Illinois EPA came to an agreement with the DRSCW to delay implementation of the TMDL recommendations while the DRSCW developed a plan to address DO. Stakeholders immediately set about rebuilding the DO models. This first project, "Stream Dissolved Oxygen Feasibility Project" set the following objectives:

- Identify the principle low flow DO sags in both waterways;
- Evaluate the impacts of decreasing oxygen demanding loadings from POTWs on the low flow ambient DO concentrations;
- Evaluate the impacts of five existing dams on DO and where significant, identify alternatives for specific dam sites,
- Identify criteria and sites where stream aeration could be used to improve DO levels during low flow conditions; and
- Determine financial impacts, including project capital costs, operation and maintenance needs, and costs associated with stream improvement projects (life cycle costs).

Model Selection

The DRSCW used QUAL2K to model the DO impairments. The QUAL2K model is capable of diurnally varying headwater/meteorological input data and includes a full sediment diagnosis model to compute sediment oxygen demand (SOD) and nutrient fluxes from the bottom sediment to the water column.

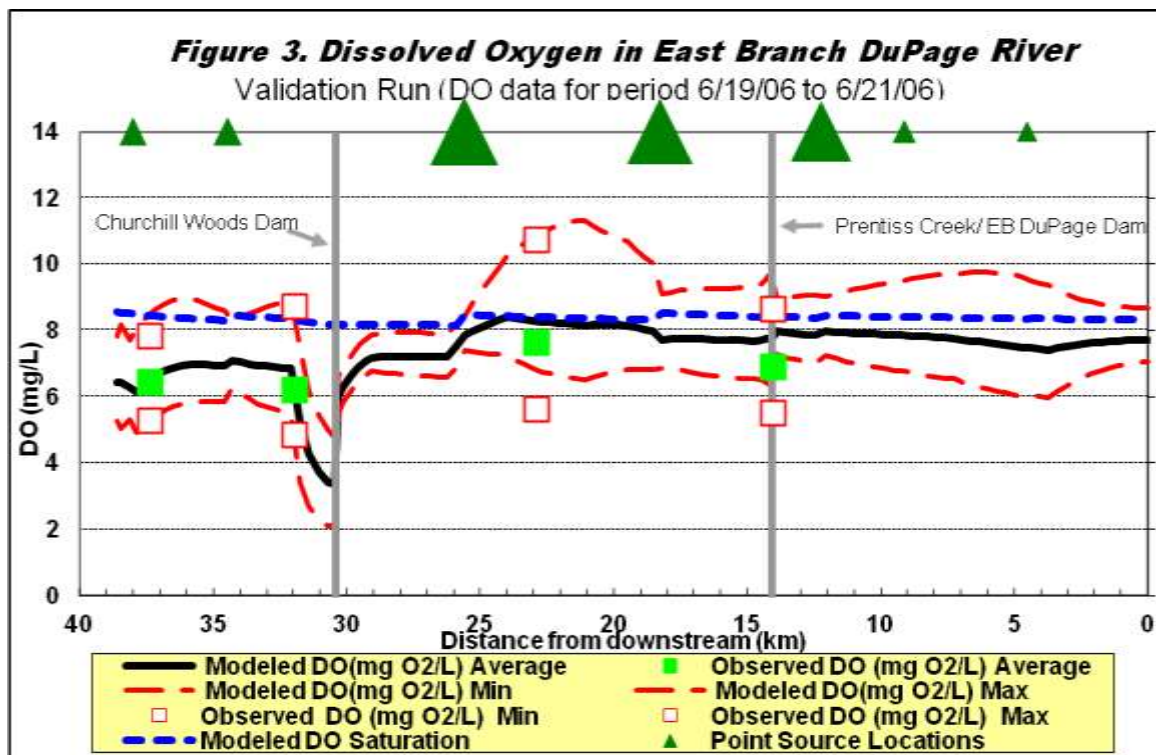
Input data from the QUAL2Emodel was used and the results of the TMDL model were reproduced prior to utilizing the new model's more refined functions. Geographical data for river miles and impoundment geometry was also refined.

Data Collection

A major criticism of the original DO model was its lack of quantitative data. While data were available on stream flow, wastewater flow, and effluent quality, very limited data existed on stream quality. Gathering such information became an immediate priority.

In the spring of 2006, the DRSCW set up a system of "continuous" DO monitoring stations. The stations collected information on DO, water temperature, conductivity, and pH at hourly intervals from May through September at six sites on Salt Creek and five on East Branch DuPage River (three additional sites on the West Branch not part of this modeling effort, were also deployed). Data on SOD were also collected at 16 sites.

All wastewater treatment facilities in the basins cooperated in the re-modeling exercise and supplied discharge monitoring data including daily values for flow, CBOD5, ammonia-nitrogen, total suspended solids (TSS) and pH to the modeling team. The DRSCW collected field coordinates for all the POTW outfalls in the two basins to ensure accurate spatial placement of the data. Additional data on river flow was collected from USGS records.



Calibrating the Model

Two calibration runs were completed for East Branch DuPage River and three were completed for Salt Creek. In the runs, model outputs were plotted against the continuous DO measurements taken during field sampling for the same date and the model was revised based on the results. Finally, model runs were conducted with the revised model, one for East Branch for the period June 19 – June 21, 2006 (shown here as Figure 3) which shows the computed DO against the ambient DO concentration observed for the same period. Computed DO is represented by the red and black lines and observed DO as green filled or red hollow squares. The diurnal range of the modeled DO is represented in both figures with the minimum and maximum DO values being shown. The green triangles shown along the top of Figure 3 represent the locations of POTWs discharging to the East Branch DuPage River. The relative size of each triangle is representative of the quantity of discharge supplied by the plant (they are shown as locations only in the other figures).

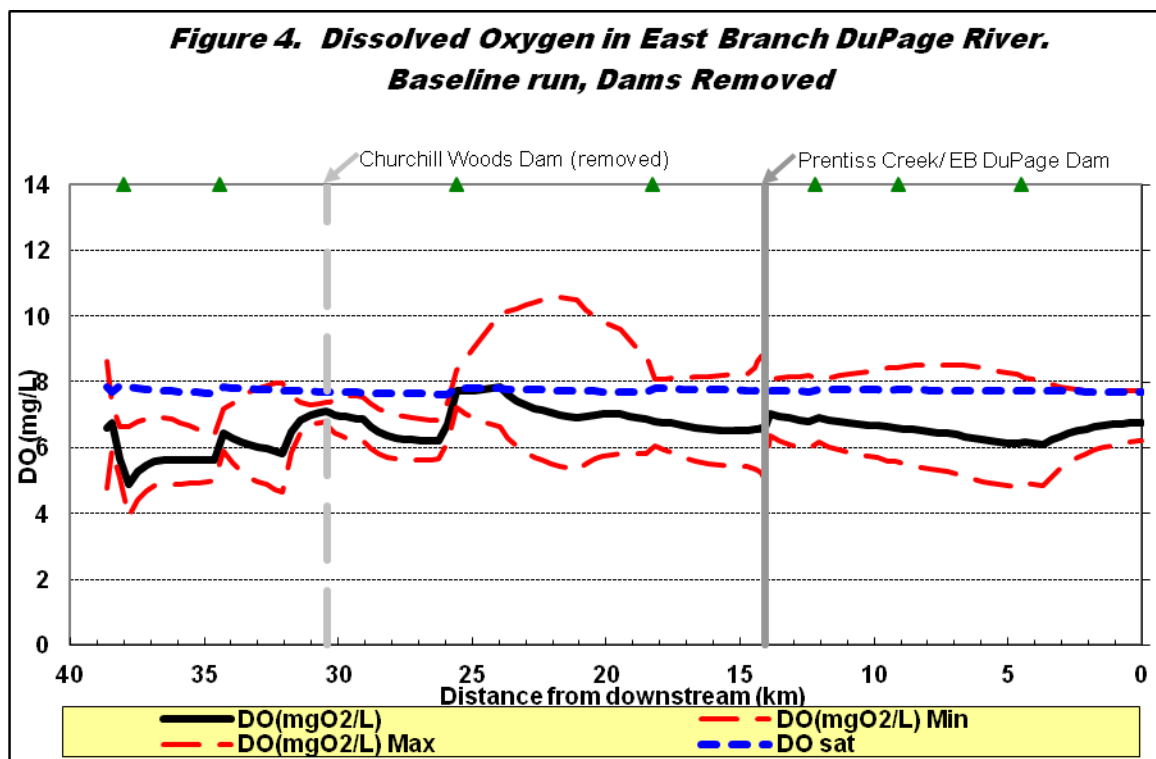
The calibrated and validated model was then used to predict ambient conditions under seven-day, ten-year low flow (7Q10) warm weather conditions using historical data sets compiled by the Metropolitan Water Reclamation District of Greater Chicago (which showed an ambient stream temperature of 30 deg C, several degrees higher than temperatures recorded during the validation/calibration periods) and warm weather flow and loadings from area POTWs. This model run was intended to reflect worst-case conditions. The baseline output for East Branch showed the principal DO sags were upstream of the Churchill Woods Dam on the East Branch DuPage River and upstream of the Fullersburg Woods Dam on Salt Creek.

Modeling Alternatives

The DRSCW was ready to use the baseline model run to project the impacts on ambient DO concentrations of various remediation efforts. The following alternatives were explored:

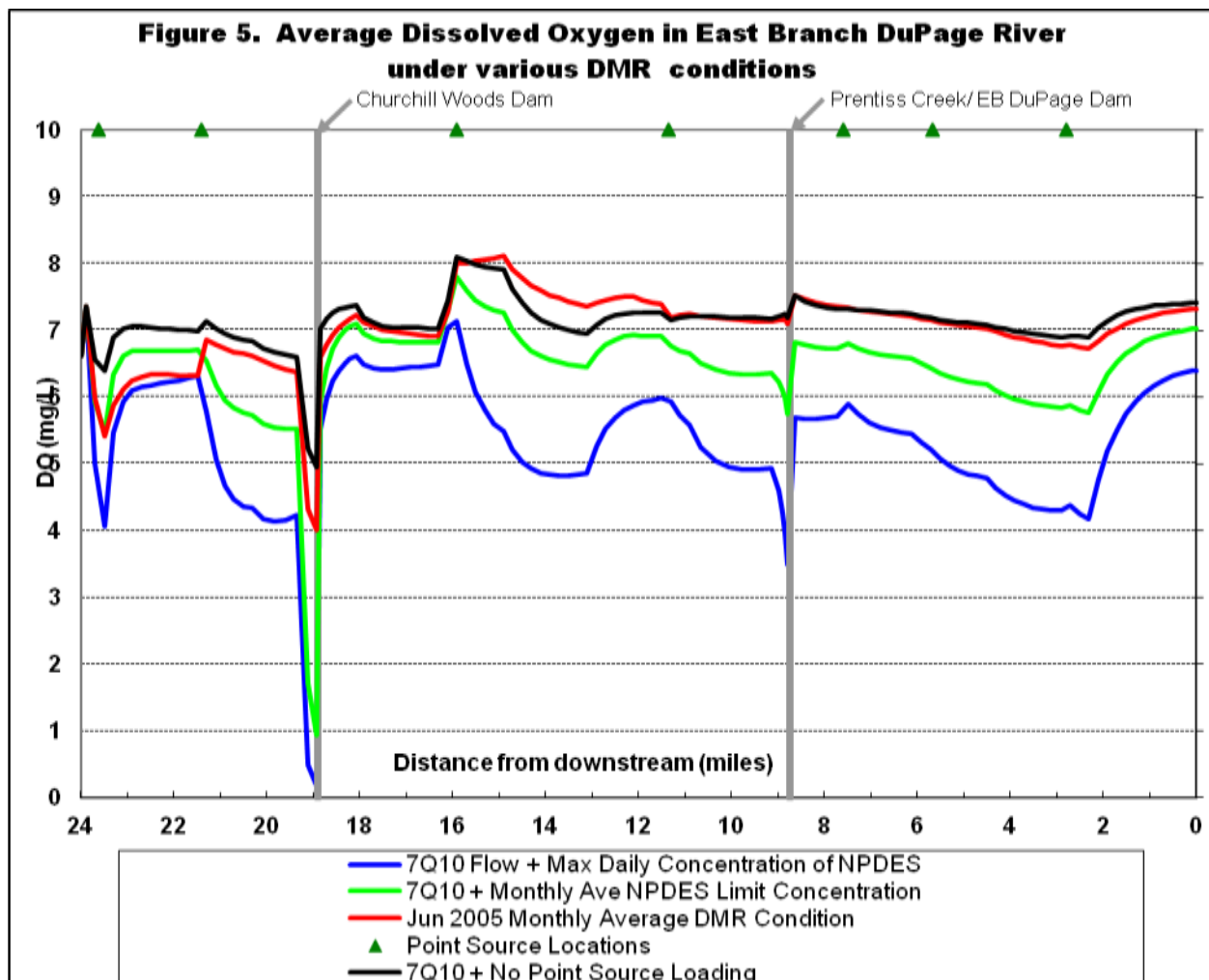
- Lower POTW loadings to zero while maintaining flow (a strictly theoretical exercise);
- Full removal of the Churchill Woods dam;
- Full removal of the Fullersburg Woods dam;
- Partial breach of the Fullersburg Woods dam;
- Lower the crest of the Fullersburg Woods dam by increments; and
- In-stream aeration with air or high-purity oxygen in the dam impoundments.

The “zero loading” model run for the East Branch DuPage River showed that the DO impairment would still exist at the site, even without any pollutant loading from the POTWs (see figure 5). Given that this POTW alternative was projected to cost more than \$6 million, the preferred action at the Churchill Woods location became full dam removal (cost of \$1.5 million).



DO concentrations at the site would approach compliance following full removal. The dam removal modeled output is shown in Figure 4. The project was complicated by the presence of culverts immediately downstream of the dam that set the stream floor elevation higher than that used in the dam removal model. The project was carried out in March 2011 and fish surveys conducted three months later found two additional species of fish not previously

present had moved into the area of and upstream of the dam. The McDowell Grove and Warrenville Dams on the West Branch DuPage River have also been removed. The West Branch DO TMDL, currently under development, was triggered by excursions below the State DO standard in these impoundments. Monitoring at the sites will continue to confirm whether the project DO goals are achieved and if additional work is necessary.



Project Proposal

DRSCW is proposing to design and implement the following projects as implementation of the TMDL. Details on the projects are supplied in Table 1. Monitoring and assessment under this initiative are integrated into the data gathering and analysis set out in Appendices 1 and 2 and the key recommendation of modifying the Fullersburg Woods dam is a priority on both the DRSCW TMDL and IPS project list:

- Modification of the Fullersburg Woods dam to eliminate the impoundment (Salt Creek Basin river mile 10.5).
- Full removal of the Oak Meadows dam (Salt Creek Basin river mile 23.5) and construct in-stream riffles.

- Monitor and document the impacts from the McDowell Grove, Warrenville and Churchill Woods dam removals/modifications and accompanying riffles on DO.
- Maintain the Continuous DO monitoring program but investigate adding chlorophyll a.
- Assist Illinois EPA in completing the DO modeling for the West Branch DuPage River.

The DRSCW will use its resources to conduct the following:

- Continuous DO and pH monitoring on all three waterways at present or expanded locations (currently at 15 sites). This effort includes in-kind services from Agency members for monitoring station installation, operation and maintenance.
- Review the QUAL 2K model for East Branch DuPage River following Churchill Woods dam modification, data accumulation, weather and other potential projects (Hidden Lake and Route 53).
- Modify the Fullersburg Woods dam and remove the Oak Meadows dam on Salt Creek to remove impoundments and abate related stressors, including dissolved oxygen. This effort is expected to leverage matching funds from local agencies, and could also include outside state or federal funding if available.
- Review the QUAL 2K model for Salt Creek post dam modification(s) based on data accumulation and weather.
- Assist Illinois EPA to complete analysis and conclusions of the West Branch QUAL 2K model (Illinois EPA TMDL output) and update to account for removal of the Warrenville Grove and McDowell Grove dams.
- At least five miles of program area river bank have been stabilized in the last three years (equating to approximately 1,000 lbs of phosphorous removed each year). Priority projects for the area include stabilizing approximately 17.5 additional miles of program area river bank (equating to approximately 3,538 lbs of phosphorus removed per year). Stream bank stabilization efforts can leverage local or other matching funding.
- Improve in-stream DO, by building pool and riffle sequences and increasing shading. The three dam modification projects completed for the area to-date have all included one or both of these additional actions. Pool and riffle construction can leverage local or other matching funding.

Appendix 4. TMDL Implementation: Chloride

Background

In October 2004, the United States Environmental Protection Agency (USEPA) approved chloride TMDLs for Salt Creek and the East and West Branches of the DuPage River. The TMDLs called for reductions in chloride loading, specifically from winter road salt application. The TMDLs for these watersheds were specifically derived to achieve compliance with the general use chloride water quality standard (WQS) of 500 mg/L adopted in 1972 by the Illinois Pollution Control Board (IPCB). The TMDL reports concluded that “[the] primary contributor to the [chloride WQS] exceedences is application of road salt for snow and ice control purposes. However, due to the sporadic nature of deicing activities, on a yearly basis the chloride mass contributed to the West Branch DuPage River watershed is larger from point sources than nonpoint sources.” (IEPA, 2004, West Branch TMDL) The conclusions regarding Salt Creek and the East Branch are the same. In the West Branch watershed, a 35% reduction for chloride applied in deicing operations is specified, in the East Branch watershed a 33% reduction is specified, and a 14% reduction is specified in the Salt Creek watershed (IEPA, 2004, East and West Branch TMDLs). To initiate TMDL implementation, the DRSCW initiated a Chloride Usage Education and Reduction Program Study in 2006. The study findings and recommendations were used to develop the TMDL implementation program described further in this section. Through this program, the DRSCW hopes to catalyze changes in deicing practices and reduce salt application while maintaining public safety.

Data Gathering and Analysis

A local deicing program base line was set in 2007 by sending a questionnaire to about 80 deicing agencies, 39 of whom responded (representing approximately 69% of the total watershed area). These agencies reported a total annual salt use of 126,000 tons. Survey responses indicated a total of 8,369 lane miles of road serviced by deicing programs throughout the watershed. Out of the villages interviewed, only two required that private snow plowing businesses have licenses. In those municipalities the permits were required for the office locations only, and did not regulate how deicing practices are performed. Additionally, eight of approximately 130 private snow removal companies in the watershed area were contacted. Private contractors tend to serve commercial, industrial and residential customers, clearing parking lots and private drives rather than roads. Each company’s typical annual salt use ranges from 7.5 to 500 tons per winter.

The total amount of chloride applied to the watersheds annually, in the form of road salt, was estimated from the questionnaire responses. The estimated load includes salt from municipalities, townships, the Illinois State Toll Highway Authority, and county transportation departments. Private snow removal companies and the Illinois Department of Transportation

are not accounted for. Table 6 provides the estimated TMDL and DRSCW baselines per watershed and the TMDL target loading.

	Salt Creek	East Branch	West Branch	Total
TMDL Target, Tons of Cl-/yr	13,300	5,200	13,700	32,200
TMDL Baseline, Tons of Cl-/yr	15,500	7,800	21,100	44,400
DRSCW Baseline, Tons of Cl-/yr	32,600	16,900	21,200	70,700

Table 6. Estimated Current Chloride Loading from Road Salt in the Study Area, Compared with TMDL Road Salt Chloride Allocations. Table is for tons of chloride and does not include private snow removal companies or the Illinois Department of Transportation

Program Design and Implementation

The DRSCW carried out a literature review to identify the best management practices to reduce chloride loadings from winter deicing operations. The following target areas were identified:

- Improved Storage and Handling Practices
- Application Practices for Salt (level of service, staff training and record keeping, calibration of equipment, environmental monitoring)
- Chemical Methods – (the definitions used by Environment Canada (2003)):
 - “Anti-icing is the application of a deicer to the roadway before a frost or snowfall to prevent melted snow and ice from forming a bond with the road surface.”
 - “Pre-wetting is the addition of a liquid to solid deicers or abrasives before application to quicken melting and improve material adherence to the road surface.”

In order to improve the adoption of these best management practices, the DRSCW organized, training, technical materials and technical workshops targeting the following core areas:

- Highways staff education of NPDES goals, the impacts of chlorides on waterways, staff training on calibration of equipment, and improved salt storage and handling practices
- Watershed-wide implementation of prewetting and anti-icing programs

- Consideration of alternative non-chloride products, such as acetate deicers and beet and corn derivatives



Plate 1. Flyer for the 2011 Public Roads Chloride Reduction Workshop]

As of 2012, the DRSCW has conducted eight chloride reduction workshops throughout the program area. Four of these workshops have been aimed at public roads (largely the public sector) and three have been aimed at parking lots and sidewalks (largely the private sector). Over 400 participants have attended the public roads workshops, and over 100 attended the parking lots and sidewalks workshops. In a 2010 program survey, 14 agencies confirmed that they had made improvements to their program based on local deicing program workshops. The following is a list of changes reported by agencies due to information gathered at deicing workshops:

- Cutting back salt usage by: re-calibrating salt spreaders, applying less salt per lane mile, and not salting until snow plowing has been completed;
- Obtaining and implementing new equipment for pre-wetting and anti-icing practices;
- Spreading salt in a narrow band down the center of two-lane streets to reduce scatter; and
- Using beet juice as an alternative deicing agent.

A noteworthy finding from the survey is that the private sector (e.g., contractors that provide deicing services at hotels, schools, stores), and who had been initially assumed to have minimal impact, actually apply significant amounts of salt and contribute significantly to chloride loadings. Addressing these activities will likely require different approaches and different implementation tools. For example, DRSCW is looking at the possibility of having member municipalities adopt licensing programs or ordinances governing operations to require private companies to implement the identified BMPs, especially for storage.

Salt Application Rates and Trends

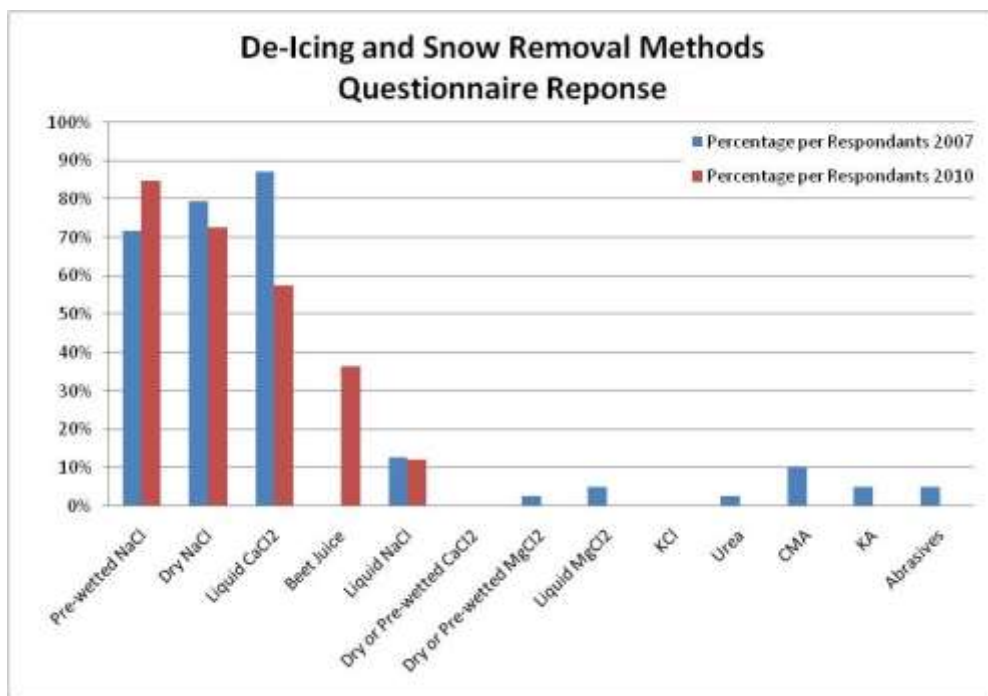


Figure 6 – Use of Deicing and Snow Removal Agents 2007 & 2010]

Many of the questions in the surveys focused on the use of alternative deicing agents, methods, and practices such as pre-wetting and anti-icing. Figure 6 illustrates the percentage of respondents that use various deicing agents as reported in the 2007 and 2010 questionnaires. Figure 6 shows an increase in the amount of agencies using pre-wetted salt (NaCl) and beet juice and a corresponding decrease in the use of dry NaCl, liquid CaCl₂, KA, abrasives, and liquid MgCl₂. Information provided in 2007 indicated that 14 agencies reported the use of anti-icing practices, while in 2010, 20 agencies reported using anti-icing practices. This has resulted in an approximate 25 percent increase in the implementation of anti-icing practices. Figure 7 shows salt application rates over the past three winter seasons provided by DuPage County DOT.

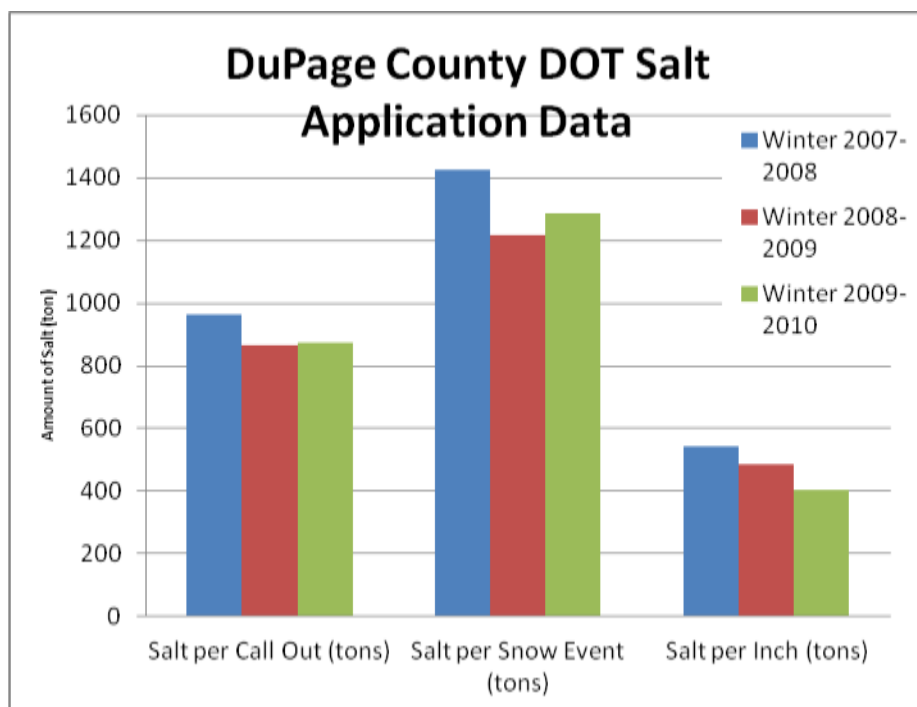


Figure 7 – DuPage County DOT Salt Application Data, 2007-2010]

Figure 7 shows that DuPage County DOT has reduced their salt usage per inch of snow consistently over each of the last three winter seasons. Salt used per call out (the number of times trucks were called out to perform deicing operations) and salt used per snow event has varied by season and weather events, as would be expected.

Snowfall in DuPage County during the 2007-08, 2008-09, and 2009-10 winter seasons was above average for the region and greater than the snowfall experienced during the 2006-07 winter season when the original survey was distributed. As would be expected, the total amount of salt used in the winter seasons was higher during seasons with more snow and less in seasons with less snow. It is important to normalize the results between winter seasons based on the severity of the winter season.

The 2010 survey asked respondents about their average salt application rate per lane mile. This information allows for more accurate tracking of a community's salt usage as it is less weather dependent than a total salt used per year. Based on data from responses to the 2010 survey, Figure 8 shows the average annual salt usage in lbs/lane mile for each watershed in the study area. Figure 9 shows the same information by placing the respondents into ranges of application rates.

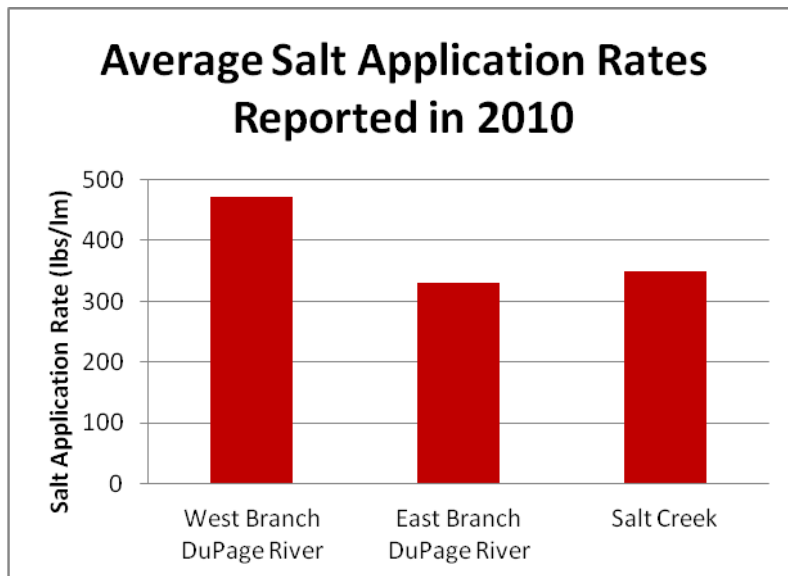


Figure 8 – Average Salt Application Rates Reported in 2010]

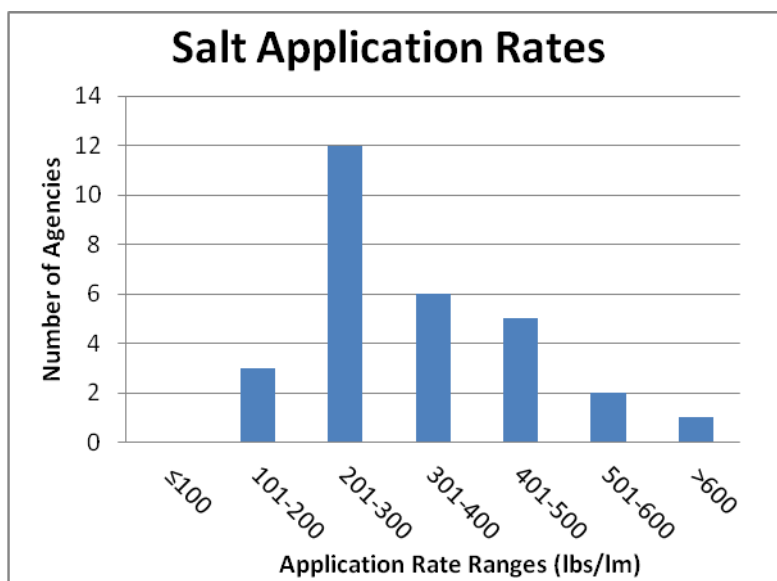


Figure 9 – Application rate ranges for surveyed municipal members]

Survey Conclusions

The purpose of the 2010 survey was to gather follow-up information to determine if alternative deicing practices are being implemented in the DuPage River and Salt Creek watersheds and any resulting effects on salt application rates. While not directly comparable, survey responses indicate that the use of alternative deicing practices has increased since 2007, and select agency data indicates a general reduction in salt application rates between 2007 and 2010. Improvements in deicing practices and lower application rates are the result of an increase in the price of road salt and improved education and information provided by local deicing program workshops.

In order to perform a more definitive trend analysis of program improvements and reductions in salt usage, additional information will need to be collected over time. Information should be collected for several more years to continue to characterize deicing program improvements and resulting reductions in salt usage occurring within the DRSCW watersheds, and indicate water quality improvements.

Project Proposal: Chlorides

Details on the projects provided below are supplied in Table 1. Monitoring and assessment under this initiative are integrated into the data gathering and analysis set out in Appendices 1 and 2. Chloride is one of the proximate stressors identified by the stressor ID methodology described in Appendix 1. DRSCW will continue with this program by executing a minimum of two workshops per year to meet the following 5-year bench marks (based on the current municipal survey group of 33 agencies):

- Increase agencies participating in survey to 43 (currently 33)
- Move all agencies application rate to < 500 lbs/lm (currently 3 higher than that)
- Increase number of agencies anti-icing to 18 communities (currently 12)
- Increase number of agencies pre-wetting (currently 33, new additions will come from new participants)
- Reduce number of agencies storing exposed salt to 0 (currently 11)
- Carry out full review of current calibration practices and improve it by 50%
- Train 30 private companies and 10 parks departments to carry out regular calibration on equipment

Elgin O'Hare Western Access Project Offset Program

The DRSCW will work collaboratively with the Illinois Tollway (the Tollway) to identify opportunities and implement measures that help reduce and offset additional chloride loading created by the Elgin O'Hare Western Access Project (EOWA) within the DRSCW's program area. It is estimated that the project will introduce approximately 1500 tons of sodium chloride into the DRSCW program area annually. The Tollway and the DRSCW will cooperate to calculate additional loadings based on agreed upon assumptions about winter storm frequency and severity.

The Offset Program will establish a framework to offset increased loadings by a ratio of 1 ton incremental increase to 1.25 offset. The offset will be realized by "Tier 1" communities, local government entities that are immediately upstream or bridging the project corridor, and the Tollway.

The Tollway will identify operational efficiencies that will result in reduced application rates. The DRSCW will review the winter operations of the Tier 1 communities for efficiencies in the following areas:

- 1) Driver training
- 2) Salt spreader calibration
- 3) Develop appropriate application rates
- 4) Pre-wet de-icer
- 5) Equipment updates
 - Speed servo controls
 - On-board pre-wet
 - Computer controls
 - Storage & Handling
- 6) Coordinate salt application during plowing
- 7) Control salt spread width
- 8) Prioritize road system
- 9) Anti-Ice

The Tollway will provide funding for Tier 1 communities to implement identified efficiencies to reduce their chloride loadings. The aggregate of the two reductions (Tollway + Tier 1 communities) will be greater than the calculated marginal increase in chloride loading created by the Elgin O'Hare Western Access Project.

Appendix 5 Polycyclic Aromatic Hydrocarbons

Early workgroup monitoring found polycyclic aromatic hydrocarbons (PAHs) in stream sediment throughout the watershed. PAHs are a known stressor impacting stream health. Recent research shows that a significant source of PAHs is the use of coal tar based sealants (RT-12). The DRSCW will educate its members on coal tar based sealants (RT-12) as a source of PAHs. The DRSCW has produced a draft Memorandum of Understanding (MOU) for members to sign. The MOU commits the Public Works Department of the signing entity to discontinue the use of coal tar based sealants (RT-12). 75% of the DRSCW agency members will execute the MOU. Copies of the executed MOUs will be transmitted to IEPA before the expiration date of the pending NPDES permits.

Appendix 6