

September 28, 2017

Subject: DRWW Comments on the Draft Report: Biological and Water Quality Assessment of the Upper Des Plaines River and Tributaries 2016

General Comment: my overall impression is that this will be a great resource for watershed management in the next decade. Most of my comments are related to clarifications and I tried to catch a couple typos but my review of grammar and typography was not extensive. I did not review or critique the scientific analysis of the data, I think MBI's work in that area is excellent.

General Comment: was there any trend analysis or relationship apparent for chemical/physical WQ parameters and drainage area (mainly for the tributary sites)? Just a thought I had while reading through. The DPR mainstem trends are shown in an up- to downstream gradient that acts as a surrogate for drainage area, so wondering if similar patterns bear out across smaller watersheds. Of course, the addition of WWTPs on some of the tribs has a noticeable effect as well, so those might have to be filtered out.

P. 19, Dams - was there any consideration of dams on tributaries?

P.27, "This classification of indicators represents the essential technical elements for the pollution survey design that was employed in the Robinson and Sugar Creek bioassessment by using each indicator *within* its most appropriate role which are most appropriate for each (Yoder and Rankin 1998)." - Was it also used in the DPR bioassessment?

**Commented [PME1]:** Was it also used in the DPR bioassessment?

P. 35, Mean Total Ammonia/River Mile Graph - Is it possible to indicate what A-L and 1-8 represent on the arrows on the top of the graphs? I believe these are WWTP discharges and streams, but that is not clear

P. 47, Table 9. Are the footnotes missing from the table headers? I'm guessing these are the median values from these sites.

P. 63, **Upper Des Plaines River Tributaries.** "...Relatively few sites have been directly channelized?" I don't know if this is true. Based on aerial photography, many appear to have been historically channelized, however, as to whether or not there is a lingering ecological signature, I will defer to MBI. I have noted several locations below where historical channelization appears to have occurred based solely on planform/channel pattern of the stream.

**Commented [PME2]:** I don't know if this is true. Based on aerial photography, many appear to have been historically channelized, however, as to whether or not there is a lingering ecological signature, I will defer to MBI. I have noted several locations below where historical channelization appears to have occurred based solely on planform/channel pattern of the stream

P.67, Table 13. The Des Plaines River mainstem has been channelized in numerous locations, although these locations may not be directly in the footprint of the sample site. 13-5, 13-3, and 16-6 are very close to such locations, however. Additionally, 16-6 is not listed here, although it appears on the DRWW map to be a QHEI site.

P.85, Figure 20. Any explanation of the "bowed" pattern of Figure 20? Is it simply that most sites fit into the 2-20 sq. mile drainage area and skew the stats downward?

**Review Comments on MBI Report – Jim Bland**

**Hastings and North Mill**

Station 10-5 below STP on Hastings Creek;

Station 10-4 is in Farmland on highly channelized channel

Station 10-3 is on North Mill Creek as it comes out of Antioch

Station 10-2 is below the restoration project on Rasmussen Lake

Station 10-1 is on North Mill Creek in “naturalized” section of stream

Station 10-6 Trib to N. Mill coming out of McDonald Lakes

Some of the low IBI numbers are based on very small sample of fish.

Is it reasonable to assign an IBI when the sample size is so small? No identification of what might be suppressing fish numbers ( i.e toxicity?)

Station 10-6 does not appear on bacterial chart

If STP have improved why are we getting poor results downgradient on Hastings Creek plant. Should have good flows, habitat is “good” as well

It would be helpful if a map of the subwatersheds were included with the report

TSS on North Mill Creek is “outta sight”. High steep banks and heavily channelized reach. So what can be done about it.

Increase in total P and Nitrate N from 10-5 to 10-4 implies non-point source contribution from farming

Station 10-6 coming out of McDonald Lakes drains a residential lakes area but it still has a very low IBI and poor representation of fish?

IBI	Rel #s
13	10
11	64
14	639
13	641
22	179
12	56

## Review Comments (General) for 2016 Upper DesPlaines Assessment

These complicated results are, in general, explained in understandable charts, tables and graphs. The formatting is very good. The inclusion of multiple grading indices for parameters like salt, ammonia-N, TSS, and others is highly desirable and well done. Given 8000 data points MBI has done a wonderful job in integrating this information into an approachable document. The color coding of results is very helpful. The inclusion of DELTs is also good and gives a different dimension of the data.

It would be helpful if a map of some of the subwatersheds (as used in the various figures) were included with the report.

According to USGS: *The physical factors that are of greatest ecological significance include streamflow (discharge and velocity), channel shape, channel substrate, and water temperature (Gordon and others, 1992).* MBI has correlated some physical characteristics and land use with attainment and non-attainment. The attribution of "urban" influences is not a sufficient description of land use influences on stream quality. We anticipate additional analytic work using a broader variety of land use descriptions as well as stream flow profiling.

Color shading is not explained in the footnotes of Table No. 7. Multiple cross references of exceedences are noted but color shading is not explained. What is red, what is orange, what is purple?

According to the USGS DesPlaines report of 2005 "impervious cover" was the principal environmental variable

with fish DCA axes (IMPERV >= -.55 w p correlation < 0.001). Impervious cover needs to be incorporated in

future analyses of the subwatersheds used in the report.

The 2005 USGS report identified water borne PAHs (naphthalene, fluoranthene, pyrene), and an insecticide

(diazinon) at multiple sites (>20 for 45 total sites) in the DesPlaines drainage. This was a comprehensive

report on chemical, physical, and biological influences on the DesPlaines drainage and a brief section

should be included which compares results of these two studies.

No data is presented in Appendices for macroinvertebrates and QHEI?

The watershed plan which is being prepared anticipates the use of the MBI data. There needs to be an explicit statement of how the MBI data is to be used in the watershed plan. How is it to be integrated with land use modeling?

Causes and source categories need to be elaborated in greater detail; i.e what is habitat alteration? If that means channelized segments then it should be stated as such.

Oxygen demand sampling is not adequately explained since BOD values were not taken as part of the monitoring program

Given the profoundly different context on the Aptakistic subwatershed ( one site is immediately downstream from a STP, other sites are upgradient and only subject to non-point source discharge) is it reasonable to "lump" their data together?

Locations of the supplemental fish sites have not been incorporated into the SMC map. Appendix A-1 lists the supplemental sites but I'm unclear about how they have been incorporated into the report.

Can't find Table A-4 in Appendix A (cross reference p. 25)

### **Aptakistic Creek**

18-4 West branch Aptakistic residential/park Twin Creeks Park

Heavily channelized stream reach

18-3 Cooperwood drive off Thompson Blvd. Heavy residential

Just upstream from detention pond; heavily channelized

18-2 Immediately upstream from STP at pekara road

18-1 At end of aspen road; downstream from STP

18-5 Unnamed trib to Aptakistic

How is it possible to have such high IBI numbers with so few fish ( cf. 18-4)?

18-1 is immediately downstream from STP

Asterisked numbers in Table no. 1 are not explained

18-1 has bacterial spike as one might suspect

Aptakistic Creek STP has 16.0 MGD....this is very high for such a small stream; flow monitoring at DesPlaines should reflect STP influence

There are no figures for total ammonia for the Aptakistic subwatershed?; TKN figures for the subwatershed are unclear and not explained; Nitrate Nitrite figures for Aptakistic are exceptionally large

Data for Aptakistic Creek TSS are unclear ( cf. TSS by subwatershed)

P values for ambient water for Aptakistic are in excess of effluent standards for STP ( i.e. 2.42 mg/l) Is lumping of values for watershed valid?

Station 18-2 is very diverse ( 19 species)

Delt anomalies occur downstream of STP

IBI	Rel. #	mIBI
27	62	18.5
17.0	134	25.6
26.0	816	30.7
24.0	525	23
27.0	33	

**Review Comments on MBI Report**

## **Bull Creek**

Station 14-6 Bull Creek as it drains into Loch Lomond

Station 14-5 Bull Creek below Loch Lomond before St. Mary's

Station 14-2 Bull Creek at Rt. 137

Station 14-1 Bull Creek at Rt. 21 ( partial attainment)

## **Bull Creek West? Branch**

Station 14-4 Upper part of North branch of Bull Creek just off of rt. 45

Station 14-3 Below residential complex ; lower on north branch

Subwatershed designated as Bull Creek West, should be Bull Creek North

Bull Creek N. and S. join before discharging to DesPlaines; should they be combined as single subwatershed?

Relative numbers are given per 1000 ft. or .3km reaches ; hard pressed to believe that reach delivered less than 50 fish

Station 14-2,14-1 show elevated bacterial counts but they are a long distance from STP; elevated CI as well

Multiple lakes are associated with this subwatershed that will modify flow regime and fish/macro and composition on IBI.

Siltation is identified as cause of non-compliance. This is unusual since the station 14-5 is immediately downgradient from lake?

Siltation at 14-2 may be due to channelization.

Station 14-1 is influenced from main stem of DesPlaines

(p44) Indian and Bull Creek values for Total ammonia, TKN, are lumped ? TKN values x-reference DuPage IPS for TKN. What is the origin of that?

fIBI	#'s	mIBI
12	< 50	22.1
25	149	17.5
28	476	35.3
36	1310	62.9
*	*	*
16	436	18.7
26	480	64.2

According to Lake County Health Department there are 90 lakes on the watershed. Load allocations and TMDLs imply that a very different type of monitoring would have to proceed, monitoring sites would have to be changed, flow monitoring would have to accompany acquisition of nutrients, monitoring frequency would have to be modified. Some of the lakes have already had TMDLs prepared and approved by IEPA. Others have not. Many/most of these lakes are not meeting Aquatic Life standards as assigned by IEPA.

DRWW lakes committee needs to identify a set of lakes to receive upgraded monitoring program.

There is no table of contents, list of figures, etc. for the report? That being the case the draft is difficult to read and review.

Stream Order is not identified for these sites. This could be significant since IEPA does not appear to have IBIs for Stream Order 1 and 2? The question that is begged is....is it reasonable to apply these metrics to the smallest headwater channels?

Unique/rare species that have shown up in the survey include:

- Long nose gar common in lakes not in streams
- Rosyface shiner genetic differentiation w carmine shiner
- Pirate perch densely vegetated areas; anus is found forward; nocturnal
- Tadpole madtom
- Stonecat madtom
- Red ear sunfish adult red ears are mollusk eaters

Relative numbers in Fig. No. 1 are given as #/0.3 km however Appendix B identifies sampling reaches which are smaller?

Sediment toxicities based on TEC values and PEL values indicate that macroinvertebrate numbers (mIBIs) don't correlate well with TEC, PEL concentration metrics. Also, the high levels of manganese in the sediments don't agree with the water quality results for heavy metals where no heavy metals are recorded in excess of W.Q. standards. It is not clear how the synergistic action of multiple contaminants might present themselves. McDonald does provide a method with which to weight presence of multiple contaminants.

It might be useful to have a simple list of sediment hotspots.

Particle size is routinely screened by IEPA for evaluation of dredged sediments. This is routinely done because it has a bearing on adsorption and desorption of chemical parameters. That data should accompany

the presentation of sediment chemical parameters. Table 10 is cut off on multiple pages of the document;

margins need to be adjusted.

Page 48 and Fig. 9 We presume Fig. 9 chart replicates station DO values taken by field staff during daytime sampling runs. Chart should indicate source of data (Suburban Labs ?). Total organic carbon was substituted for BOD because of cost. Correlation of TOC with BOD and COD can only be achieved by an initial baseline comparative characterization test, with representative samples of the stream to be analyzed. To our knowledge this has not been done. MBI should explain what needs to be done to calibrate and correlate TOC and BOD. No mention is made of sediment oxygen demands that may be operable. Diel profiles of DO need to be done on selected stream reaches to validate impact of point and non-point source loads.