



Not to scale. Iowa Darters are commonly 2.1" long (2"-2.25"). Photo Credit: Dr. Philip Willink.

An Iowa Darter. This native species may be moving back into the East Branch. See page 3.

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LETTER FROM THE PRESIDENT

New Permits and New Obligations—Dave Gorman

New draft NPDES permits have been arriving at area wastewater treatment plants. These permits, renewed every five years, set the level of treatment that the plants will need to achieve during future permit cycles. Several newly introduced permit conditions are worth noting. Along with the long-planned, gradual phasing in of limits on phosphorous, we're now seeing new limits on fecal coliform (bacteria) and the first proposals for limits on chlorides (salts). The IEPA has been building the case for placing these conditions in permits for years via its Total Maximum Daily Loads (TMDL) studies and also its biennial waterway evaluation.

It's in everyone's interest that this permitting process, from identifying pollutants to setting requirements, is carefully scrutinized. This means that permittees need to engage constructively with the IEPA. We're looking out for the interest of our members by conducting and collecting independent monitoring data to compare with and compliment the State's information (see our East Branch Bioassessment report summary overleaf). We're also staying

up to date on the latest pollutant research and working with the IEPA to review its proposals and analyses. We believe that it's vital that these regulations are:

- supported by adequate data and analysis,
- not in conflict with other obligations,
- effective in moving towards the stated goal (human safety and/or aquatic health), and
- efficient (favorable benefit cost ratio or relatively inexpensive).

Since our founding in 2005, the DRSCW has engaged with the IEPA to allow our members to meet Clean Water Act objectives in an innovative, adaptive management manner that is both effective and efficient. We're also paying attention to "emerging pollutants", that aren't currently regulated but are likely to be in the near future (see our invisible pollutants item). As a science-driven organization, our goal is to ensure that any forthcoming regulations will be efficient, well-crafted, and measurable. We'll continue to work hard on behalf of our members to sensibly improve our shared local waterways.

2019 EAST BRANCH DUPAGE RIVER BIOASSESSMENT

Alex Handel, *DRSCW and The Conservation Foundation*

In 2019, the Midwest Biodiversity Institute (MBI) assessed the East Branch of the DuPage River for DRSCW in an effort to map the health of aquatic communities and identify where they are not meeting state standards. This data can be used to spot trends and plan interventions to help improve the waterways.

What is the Bioassessment?

The bioassessment surveys three families of indicators: 1) biological status, 2) water and sediment chemistry, and 3) physical habitat, to determine river health. Biological status (fish and insects) is both the principle indicator of stream health and the principal driver of the new NPDES permit requirements. Under State law a waterbody must host sufficient native fish and macroinvertebrate species to be in compliance. The scale used by regulators for measuring biological status in aquatic health is the Index of Biotic Integrity (IBI).

If fish and macroinvertebrates are lacking, water chemistry and physical habitat (land use, channel shape, and channel structure) attributes of the watershed may provide clues as to why.



Figure 1. Map of East Branch DuPage River Watershed. Sample sites are above and below treatment plants, on major tributaries, near points of interest (DRSCW projects, dams, etc.) and spaced along the main-stem to create high resolution data. The reference sites are located in Kane County.

What were the results on the East Branch of the DuPage?

The East Branch DuPage River flows through urban neighborhoods and past eight wastewater treatment plants that contribute a design average flow of 52.77 million gallons per day. The bioassessment sampled a total of 42 sites along the East Branch and two additional sites of comparable geology to compare as controls.

The assessment found that macroinvertebrates and fish are uniformly below the State's required "Good" standard, with macroinvertebrates slightly outperforming the fish. The macroinvertebrate IBI was "Fair" in nearly all sample sites with fish

IBI rankings mostly at "Fair" to "Poor." Fish suffered largely from limits on physical access created by the Channahon and Hammel Woods dams (the latter removed 2021) on the Lower DuPage River.

Outside of dams, the biology scores were largely a function of the surrounding urban land use and lack of river habitat. Bioassessments show that habitat quality hasn't improved much since surveys began in 2007. To restore fish and macroinvertebrate populations, habitat will need to be improved at many sites by removing more dams, improving banks, and creating gravel river beds, pools and riffles.

On the chemical level, nitrate and phosphorus concentrations were highest immediately downstream of wastewater treatment plants. As a result, they were highest upstream (northern) of the main stem and fell downstream as they were diluted by inputs from tributaries that lacked wastewater effluent discharges (see Figure 1).

High nitrate and phosphorous levels may contribute to large swings in dissolved oxygen (DO) that were observed in the East Branch. These chemicals feed aquatic plants which produce oxygen through photosynthesis. DO increases during the day, peaks in late afternoon, and decreases during the night, reaching its nadir before sunrise (see Figure 2). While it's natural for DO to vary, the East Branch DuPage River often exceeds the DO water quality standard.

What is going to happen with this data?

The Bioassessment is being used to understand trends, set priorities, and plan remediation projects such as the Hammel Woods Dam removal (completed in 2021) and Lower DuPage Habitat Restoration project which kicked off in October 2021. The former established passage for five fish species, and the latter aims to create habitat to attract them into the East Branch. If these projects are successful, the next Bioassessment for the East Branch DuPage River in 2023 will show improved biological scores.

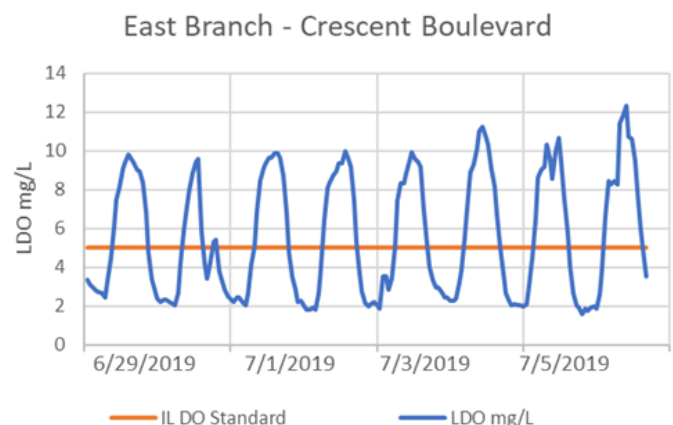


Figure 2. Summer DO measurements at Crescent Blvd in Glen Ellyn. Note the diurnal fluctuation in DO concentration.



A LONE DARTER

We had a new arrival in the East Branch this year, found during a pre-project survey. The individual Iowa Darter seems to have come up from the DuPage River main stem and marks the first time that this species has been found in the East Branch DuPage River since surveys began in 2006.

CHEMICALS YOU CAN'T SEE CAN IMPACT ECOSYSTEMS

Greg LeFevre, *University of Iowa, Assistant Professor, Civil and Environmental Engineering*

In the last century, human life expectancy has dramatically increased due to improved sanitation and medicines. Sanitation systems such as wastewater treatment plants treat human waste to remove dangerous pathogens and protect rivers or lakes when the water is returned to the environment. However, water treatment plants have not been designed to remove the pharmaceuticals present in human medicines. These complex molecules are capable of passing through human bodies, surviving the wastewater treatment process, and then being released into rivers and streams.

Does it matter that pharmaceuticals are present in rivers and streams? Pharmaceutical chemicals are designed to impact the functions of organisms which makes them great for treating illnesses, but can also have unintended effects. The US Geological Survey (USGS) conducted studies that showed that fish downstream from wastewater treatment plants exhibited higher rates of intersex characteristics (having both male and female sex organs). Only after a treatment plant upgrade was there a significant reduction in pharmaceutical concentrations and endocrine disruption in fish.

Pharmaceuticals in wastewater are most likely to have impacts in rivers which get a significant portion of their flow from

wastewater discharges like Salt Creek and the DuPage River. During dry parts of the year, effluent from wastewater treatment plants has been recorded to make up close to 90% of the West Branch and over 95% of the East Branch of the DuPage River. Because there is less water other than effluent to dilute any pharmaceuticals present, the concentrations to which fish are exposed is typically higher.

More recent research from the University of Iowa and the USGS involved a study of an effluent dominated stream in eastern Iowa to understand how pharmaceuticals change and impact fish. They found that pharmaceutical levels in the stream vary significantly by season. For example, allergy medicines were significantly higher in the summer than winter. They also found that while some pharmaceuticals are significantly lost downstream, some persist for a long distance from where they are discharged.

These studies help us better understand what happens to our medicine after it leaves our bodies and enters into our sanitation systems. They also are leading us to invent new ways to protect our effluent dominated streams and the wildlife that live in them.

Many communities offer takeback programs to enable proper disposal of unwanted medicines. For information about how to start a program in your community, contact Sarah Zack at szack@illinois.edu.

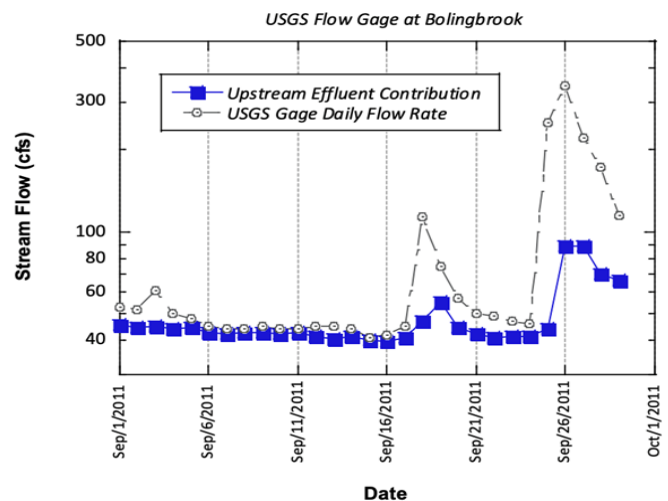


Figure 3. Average daily flow in September 2011 at the USGS flow gauge at Bolingbrook charted next to the recorded effluent flows from dischargers on the East Branch DuPage River and its tributaries.

2021 DEICING WORKSHOPS

This year the deicing workshops were planned along with staff from Lake County and sponsored by other watershed groups and counties. Data collected from the five workshop surveys indicated that at least 939 individuals attended, with 830 at the Public Roads and 196 at the Parking Lot & Sidewalks workshops. Fortin Consulting handled the presentations and technical aspects of these online workshops with their usual expertise.

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